Hearings Examiner Meeting Agenda
Tuesday, December 09, 2025, 5:00 PM
Council Chambers, 616 NE 4th AVE

NOTE: The City welcomes public meeting citizen participation. TTY Relay Service: 711. In compliance with the ADA, if you need special assistance to participate in a meeting, contact the City Clerk's office at (360) 834-6864, 72 hours prior to the meeting so reasonable accommodations can be made (28 CFR 35.102-35.104 ADA Title 1)

To Participate Remotely:

OPTION 1 -

1. Go to www.zoom.us and download the app or click "Join A Meeting" and use Meeting ID – 886 7775 5231
2. Or, from any device click https://us06web.zoom.us/j/88677755231

OPTION 2 - Join by phone (audio only):
Dial 877-853-5257 and enter meeting ID# 886 7775 5231

For Public Comment:
Click the raise hand icon in the app or by phone, hit *9 to "raise your hand", or email to communitydevelopment@cityofcamas.us

These will be entered into the meeting record. Emails received up until one hour before the start of the meeting will be emailed to the Meeting Body prior to the meeting start time.

CALL TO ORDER

INTRODUCTIONS AND INSTRUCTIONS

HEARING ITEM

1. The Reserve at Green Mountain (File No. SUB25-1004)
   Presenter: Yvette Sennewald, Senior Planner

2. The Landing at Green Mountain 2 (File No. SUB25-1006)
   Presenter: Yvette Sennewald, Senior Planner

CLOSE OF MEETING

LAND USE DECISION

STAFF REPORT

The Reserve at Green Mountain Subdivision

Planning Case SUB25-1004

Report Date: December 3, 2025

TO	Hearings Examiner	**HEARING DATE**	December 9, 2025
PROPOSAL	To subdivide approximately 11.3 acres into 38 single-family residential lots.		
LOCATION	The site is located at 2625 NE Goodwin Road in the SW ¼ of Section 21, Township 2 North, Range 3 East, of the Willamette Meridian; and described as tax parcel number 173192000.		
PROPERTY OWNER	Marwan A. Bahu PO Box 744 San Clemente, CA 92672	**APPLICANT**	PLS Engineering Attn: Jayson Taylor 604 W Evergreen Boulevard Vancouver, WA 98660
APPLICATION SUBMITTED	May 28, 2025	**APPLICATION COMPLETE**	September 2, 2025
SEPA	The City issued a SEPA Determination of Non-significance (DNS) on October 16, 2025, with a comment period that ended on October 30, 2025. The SEPA DNS was mailed to property owners on October 15, 2025, and published in the Post Record on October 65, 2022, as Legal publication #142050.		
PUBLIC NOTICES	A Notice of Application was mailed to property owners within 300 feet of the site on October 8, 2025, and published in the Post Record on October 9, 2025. Legal publication #1040940. A Notice of Public Hearing was mailed to property owners within 300 feet of the site on November 19, 2025, and published in the Post Record on November 20, 2025. Legal publication #1049780.		

APPLICABLE LAW: The application was submitted on May 28, 2025, and the applicable codes are those codes that were in effect at the date of the application's first submittal. Camas Municipal Code (CMC) Title 16 Environment, Title 17 Land Development, and Title 18 Zoning, specifically (but not limited to): Chapter 17.11 Subdivision, Chapter 18.11 - Parking, Chapter 18.13 - Landscaping, and Chapter 18.55 Administrative Procedures. [Note: Citations from Camas Municipal Code (CMC) are indicated in *italic* type.]

CONTENTS

SUMMARY 2

FINDINGS 2

Chapter 16.07 State Environmental Policy Act 2

Chapter 16.31 Archaeological Preservation 3

Chapter 16.51 Critical Areas 3

Chapter 17.11 Subdivisions 4

PUBLIC COMMENTS 24

CONCLUSION 24

RECOMMENDATION 24

CONDITIONS OF APPROVAL ..... **Error! Bookmark not defined.**

SUMMARY

An application has been made to the City of Camas for preliminary plat approval to subdivide approximately 11.3 acres, situated in the R-7.5 Single-Family Residential Zone. The preliminary plat proposes to subdivide the subject property into 38 lots, ranging in size from approximately 4,541 – 12,256 square-feet.

Surrounding uses to the north, west, and east are single-family residential. To the south of the project site is Camp Currie. The single-family residential properties immediately to the east and west of the subject site are in the R-7.5 zone. The properties to the north (across Goodwin Road) are zoned R-6. The property adjacent to the southerly property line is zoned PF – Public Facilities and LI/BP – Light Industrial/Business Park.

The subject property is currently developed with one single-family residence that is proposed to remain as part of the future development of 37 additional single-family residences. The site is primarily field grass with landscaping and scattered trees. The site contains a wetland on the west/southwest portion of the site, a seasonal non-fish bearing stream on the southeast portion of the site, an Urban Conservancy Shoreline area associated with Lacamas Creek (located approximately 0.25 miles southwest of the site), Oregon white oaks, an archeological site buffer and is within a Category 2 Recharge Area per Clark County GIS maps. In addition, WDFW maps cave or cave-rich areas however no caves or rock outcroppings are present onsite. Buffer reduction, averaging, and enhancement are proposed for impacts to wetland buffers. All onsite oak trees are proposed to be retained. There are no direct impacts to the onsite wetland and associated shoreline. The preliminary plans indicate that there will be tracts set aside for a stormwater facility, open space, access, landscaping, stormwater facilities, and other related infrastructure.

The proposed preliminary plat does or can comply with the applicable standards of the Camas Municipal Code (CMC) and Revised Code of Washington (RCW).

FINDINGS

Chapter 16.07 State Environmental Policy Act

A SEPA checklist was submitted, and a Determination of Non-Significance (DNS) was issued on December 15, 2022, as the proposed development includes more than nine residential dwelling units per CMC 16.07.020.A.1. and contains critical areas. The comment period ended October 30. 2025. Three comments were received. One comment was from the Department of Fish and Wildlife (WDFW) regarding the existing Oregon white oak trees located onsite (Exhibit 31), one from the Department of Archeology and Historic Preservation (DAHP) with a recommendation for a project-specific Inadvertent Discovery Plan (Exhibit 29), and one from the Cowlitz Indian Tribe (Exhibit 30), also with a

recommendation for a project-specific Inadvertent Discovery Plan given that the project is within the Cowlitz Indian Tribe's area of concern. These comments are addressed throughout the report.

> **FINDING:** Staff finds the comments provided by the WDFW, DAHP, and the Cowlitz Indian Tribe should be complied with.

Chapter 16.31 Archaeological Preservation

The subject property is located in an area of moderate to high and high probability for the presence of archeological artifacts; therefore, an archaeological predetermination report has been prepared for the site. The report prepared by Archeological Services LLC, dated April 11, 2025, was sent to the Department of Archaeology and Historic Preservation as well as the tribes. Based on the findings in the report, no further archaeological work is recommended at this time. The report and findings are not subject to the open public records act and as such, the City cannot disclose the results.

> **FINDING:** Staff finds a condition of approval is warranted that if potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation, the Cowlitz Indian Tribe, and the City shall be notified. A condition of approval for a site-specific Inadvertent Discovery Plan will also be required based on comments received during the SEPA comment period.

Chapter 16.51 Critical Areas

CMC Chapters 16.53 – Wetlands, Chapter 16.55 – Critical Aquifer Recharge Areas, & Chapter 16.61 – Fish and Wildlife Habitat Conservation Areas

Per Clark County GIS, the subject property is mapped as having wetlands within the southeast end of the site. A Critical Areas Report prepared by Ash Eco Solutions (AES) dated May 1, 2025 (Exhibit 5). AES identified two Category II wetlands, one partially located onsite along the west parcel boundary and the second located just offsite to the southeast. A High Land Use Intensity (LUI) such as the proposed subdivision establishes a 260-foot wetland buffer for each wetland.

The Critical Areas Report also addresses several Oregon white oaks onsite as well as a non-fish bearing un-named stream in the southeast corner of the site.

All Oregon white oaks will be retained onsite. The site has been designed to avoid the oak canopy therefore no impacts are proposed to the oak habitat. The project proposes a reduction of the 260-foot High LUI wetland buffer to the 195-foot Moderate LUI buffer by establishing a 100-foot minimum corridor between Category II wetlands and the onsite Oregon white oak priority habitat, as allowed in CMC 16.53.050.C.1.a.i-ii. After modifying the standard buffer from 260-feet to 195-feet and applying the above outlined avoidance and minimization measures to the onsite critical areas, the project will have unavoidable impacts to two portions of the outer 195-feet wetland buffer: Lots 21-25 and the stormwater facility are located within a portion of the modified wetland buffer. A Buffer Mitigation Plan is included in the Critical Areas Report that provides onsite mitigation for critical area impacts. The project has been designed to avoid direct impacts to the wetlands, Oregon white oak habitat, and the highest functioning mature forested buffer habitat present onsite. Mitigation measures will include "extensive wetland buffer enhancement and Oregon white oak habitat restoration – including habitat corridor connectivity between these historically separated habitats. Therefore, the unavoidable impacts will be offset with adequate mitigation onsite for a no net loss of habitat function or values."

Staff recommends a condition of approval to follow all recommendations included in the Buffer Mitigation Plan as noted in the Critical Areas Report. A condition of approval will also be added for the installation of temporary construction fencing prior to construction that clearly marks in the field critical area buffers

(i.e., Oregon White Oak) and fencing should remain throughout permitted construction activities. In addition, prior to final engineering plan final acceptance, permanent signs and fencing should be installed at the edge of the critical area buffers per CMC 16.51.210.B and C. Signs and fencing specifications should be submitted to the City for review and approval prior to installation.

Prior to final acceptance, a conservation covenant should be recorded with the County to ensure the long-term preservation of the critical areas and any associated buffers, including maintenance of any mitigation actions, per CMC 16.51.240 and conditioned as such. Further, a copy of the recorded conservation covenant document must be submitted to the city prior to final acceptance.

The applicant will be required to post a mitigation bond in an amount deemed acceptable by the city to ensure the oak mitigation is fully functional per CMC 16.51.250.

Staff finds a condition of approval is required that detailed construction drawings per CMC 16.53.050.E.3 are submitted to the City for review and approval prior to final engineering plan approval.

> **FINDING:** Staff finds the proposal, as conditioned, can or will comply with the applicable provisions of CMC Title 16 Environment as discussed above.

Chapter 17.11 Subdivisions

CMC Chapter 17.11.030(D) Criteria for Preliminary Plat Approval:
The hearings examiner's decision on application for preliminary plat approval shall be based on the following criteria:

1. The proposed subdivision is in conformance with the Camas Comprehensive Plan, Parks and Open Space Comprehensive Plan, Neighborhood Traffic Management Plan, and any other City adopted plans.

Comprehensive Plan

The subject property is designated as Single-Family Medium in the City's Comprehensive Plan, which includes the Single-Family Residential R-7.5 zone designation.

Overall, the 2035 City of Camas Comprehensive Plan supports the subdivision through several land use policies such as the following:

- Land Use Policy 1.3: Maintain compatible use and design with the surrounding built and natural environments when considering new development or redevelopment.
- Land Use Policy 1.5: Where compatible with surrounding uses, encourage redevelopment or infill development to support the efficient use of urban land.
- Land Use Policy 3.3: Encourage connectivity between neighborhoods (vehicular and pedestrian) to support citywide connectivity and pedestrian access.
- Housing Policy 1: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community.
- Housing Policy 1.6: Encourage in-fill development on vacant or underutilized sites, subject to design review guidelines, that have adequate urban services, and ensure that the development is compatible with the surrounding neighborhood.

The proposed subdivision will help accommodate the projected growth through the utilization of existing land. The proposed houses, when constructed, will provide housing opportunities to meet the needs of the community in accordance with the Housing Element of the Comprehensive Plan.

Parks and Open Space Plan

The 2022 Parks and Recreation Open Space Plan (PROS) identifies the future T-29 trail that is shown to traverse west-to-east through the southernmost limits of the proposed subdivision. The property located to the south and east of the proposed development is owned by Clark County Parks. Per the City's 2022 General Sewer Plan (GSP) a future sanitary sewer pressure main, traversing west-to-east, from the Goodwin Road Lift Station (LS) to NE 232nd Avenue is proposed. The applicant is required to construct a segment of the T-29 public access trail that will be located on said development. An easement over and under the segment of the T-29 is required that encompasses both the public access trail and the future sanitary sewer main.

Staff recommends a condition of approval that prior to final plat approval, the applicant is required to show an easement encompassing the T-29 public access trail and the future sanitary sewer pressure main.

Neighborhood Traffic Management Plan: The City has a Neighborhood Traffic Management Plan (NTM). The NTM plan identifies the need for installation of acceptable traffic calming features when a proposed development will create 700 Average Daily Trips (ADT) or more.

The Transportation Impact Study (TIA) prepared by Lancaster Mobley (Exhibit 3, Table 3, page 8), dated April 23, 2025, found the project is expected to generate approximately 348 net new trips, Average Daily Trips (ADTs) with 26 new AM Peak Hour trips (7 In / 19 Out) and 35 PM Peak Hour trips (22 In / 13 Out). Therefore, the proposed development will not be required to install traffic calming features.

FINDING: Staff finds that the proposed project, can and will meet the requirements as noted in the City's NTM plan.

2. Provisions have been made for water, storm drainage, erosion control, and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual.

Water:
In accordance with CMC 17.19.040.C.4 Water System, each lot within a development shall be served by a water distribution system designed and installed in accordance with the city's *Design Standards Manual* (CDSM).

There is an existing 12-inch ductile iron (DI) water main that was constructed in 2017 as part of the Green Mountain Estates Offsite Utility improvements. The 12-inch DI water main was extended from the intersection of NE 28th Street and NE Ingle Road east to the intersection of NE 28th Street and Boxwood Avenue. The 12-inch DI main was then upsized to a 24-inch DI water at said intersection and extended east to the easternmost property line of Green Mountain Estates.

The existing DI water main along the frontage of the proposed development is an existing 12-inch DI water main that is located on the south side NE 28th Street. Per the CDSM, a minimum 8-inch water distribution main is to be tapped off the 12-inch DI water main and extended the benefit of the proposed development with a minimum 1-inch water service provided to each single-family lot and a minimum 1-inch irrigation service to each open space tract.

Preliminary utility plans were submitted with the application (Exhibit 11). The utility plans (Exhibit 11) show the required 8-inch DI water main at the intersection of proposed Street 'A' and NE 28th Street. The new 8-inch DI water main is shown to extend south throughout the development to the proposed cul-de-sacs on Street 'B' and Street 'C', and the proposed private streets, Street 'D' and Tract 'A'. The 8-inch DI water main in future Tract 'A' is to be extended to a blowoff valve assembly at the westernmost property line of the proposed development for the benefit of any future development on Parcel No. 173171000.

Dead-end blowoff valves are also required at the future cul-de-sacs on Street 'B' and Street 'C', and at the end of future Street 'D'.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should submit revised water utility plans to include the following:

- The new 8-inch DI water main from NE 28th Street south throughout the development to the proposed cul-de-sacs on Street 'B' and Street 'C', and the proposed private streets in Street 'D' and Tract 'A'.
- The 8-inch DI water main in future Tract 'A' is to be extended to a blowoff valve assembly at the westernmost property line of the proposed development for the benefit of any future development on Parcel No. 173171000.
- Dead-end blowoff valves are also required at the future cul-de-sacs on Street 'B' and Street 'C', and at the end of future private Street 'D' aka Tract D.
- All water services are to be located perpendicular from the main to each lot.
- A utility easement, over and under the water main in Tract A and Tract B is to be shown on the engineering plans and the final plat.

Per CMC 17.19.040.C.4.a Locations of fire hydrants and flow rates shall be in accordance with city standards and the International Fire Code.

The utility plans (Exhibit 11) show an existing fire hydrant on the south side of NE 28th Street behind future Lots 6 and 7. Future fire hydrants are shown to be proposed at the end of the cul-de-sacs on future Street 'B' and Street 'C'. Due to spacing requirements for fire hydrants, an additional onsite fire hydrant is to be located near the intersection a of future Street 'A' and future Street 'B'.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should submit revised water utility plans that show in addition to the proposed fire hydrants at the end of the future cul-de-sacs, an additional fire hydrant is to be located near the intersection of future Street 'A' and future Street 'B'.

Per CMC 17.19.040.C.4.d Landscaping in open space tracts must have a water service for an irrigation meter. Irrigation services are to be a minimum 1-inch service. The size of the irrigation meter is to be determined in advance and shown on the water utility plans and the landscape plans. The owner of the open space tract is responsible for installation of the meter and the water usage. Landscaping water services and meters are to be privately owned and maintained by the Owner and/or Homeowners Association (HOA).

Staff recommends a condition of approval that prior to final engineering plan approval, the applicant should submit revised water utility plans and landscape plans showing the locations of all proposed irrigation services and the size of each proposed irrigation meter.

FINDINGS: Staff finds that, as conditioned, adequate provisions for water can or will be made in accordance with CDSM and CMC 17.19.040.

<u>Storm Drainage</u>:
In accordance with CMC 17.19.040.C.3 the storm drainage collection system shall meet the requirements of the city's stormwater standards, the *Camas Design Standards Manual* (CDSM), and CMC 14.02 Stormwater Control.

Per Clark GIS Property Information, the site for the proposed development is approximately 8.84 acres (385,070 SF) in size. Per Figure 1-3.2: Flow Chart for Determining Requirements for Redevelopment of Ecology's Stormwater Management Manual for Western Washington (SWMMWW), if the land-disturbing

activities are greater than 7,000-square feet, minimum requirements (MRs) 1-9 will apply. The proposed development, Parcel No. 173192000 is approximately 11.67 acres (508,345 SF) in size and will have land-disturbing activities greater than 7,000-square feet, therefore Minimum Requirements (MRs) 1-9 apply.

A preliminary stormwater Technical Information Report (PTIR), dated May 2025, was prepared by PLS Engineering. A revised PTIR was submitted in August 2025 (Exhibit 21). Per the revised PTIR the site contains an existing single-family residences and various other structures. The reminder of the site is vegetated with grass, weeds, and a variety of trees. The site slopes generally from the northeast to the southwest with grades ranging from 2% to 6% and elevations that range from no greater that 192-feet to 232-feet.

MR #1 – Preparation of Stormwater Site Plans: The preliminary utility plans (Exhibit 11) were incomplete, as the plans did not include a full set of stormwater plans; design plans for the stormwater facilities; nor profiles of said conveyance system.

> Staff recommends a condition of approval that prior to engineering plan approval the applicant should submit a complete set of stormwater plans, and the stormwater facility plans for review and approval, per MR #1 of the TIR.

MR #2 – Construction Stormwater Pollution Prevention Plan (SWPPP): The SWPPP was included as Appendix E of the preliminary TIR. The SWPPP does not include the contractor information.

> Staff recommends a condition of approval that prior to any land-disturbing activities, the applicant should be required to submit a revised SWPPP with the contractor and CESCL information.

MR #3 – Source Control of Pollution: Section D of the preliminary TIR addresses the various BMPs required for source control on page 4 of 16.

MR #4 – Preservation of Natural Drainage Systems and Outfalls: Section The preliminary TIR states that the onsite runoff flows to the southeast corner of the site. The existing runoff will be collected; some will be infiltrated, and the rest will be released at rates in compliance with Ecology's 2024 SWMMWW manual. This method is proposed to maintain and preserve the natural drainage systems.

MR #5 – On-Site Stormwater Management: Section E of the preliminary TIR provides a list of BMPs that are proposed to meet on-site stormwater management, which includes the catch basins, manholes, conveyance piping, and a stormwater detention facility.

MR #6 – Runoff Treatment: Section F of the preliminary TIR addresses the runoff treatment. Treatment is proposed via a stormwater treatment manhole that will discharge to a stormwater treatment vault prior to discharging to the stormwater detention facility, then to the stormwater control manhole and out to the stormwater outfall structure and the existing wetlands. Treatment and detention structures are not to be located outside of the public right-of-way. The stormwater treatment manhole is shown to be located at the southernmost end of the private street on Tract D.

MR #7 – Flow Control: Section G, pages 6 and 7 of 16, of the preliminary stormwater report (TIR), addresses the requirements for flow control. Flow control measures were designed in accordance with Ecology's 2024 SWMMWW. Stormwater discharges are to match the '… *pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.*'

Due to that shallow ground water depth, infiltration is not viable, therefore stormwater will be detained in a stormwater detention facility with a flow control manhole that will limit the discharge rate to the existing wetlands.

MR #8 – Wetlands Protection: Per the preliminary TIR the proposed development site consists of a category II NWI (National Wetlands Inventory) wetland located in the southwest corner of the site. Appendix F, Environmental Documentation, Critical Areas Report & Buffer Mitigation Plan (page 243 of 317) provides documentation of said wetland and discusses the impact on the wetland in Section H of the Critical Area Report.

MR #9 – Operation and Maintenance (O&M): The preliminary TIR provided a copy of the City of Camas' June 2022 *Stormwater Sewer System Operations & Maintenance Manual* (O&M) in Appendix D.

Per CMC 14.02 and 17.19.040, stormwater is not to negatively affect adjacent property owners. This requirement encompasses both roof drain downspouts and overland surface flow as noted below:

- CMC 14.02 Stormwater Control:
  14.02.010.B.2 Minimize damage to property from increased runoff rates and volumes.
- CMC 17.19 Design and Improvement Standards:
  17.19.040.C.3 Storm Drainage - The storm drainage collection system shall meet the requirements of the city's officially adopted storm water standards.
  17.19.040.C.3.e - All lots shall provide drainage for stormwater runoff from roof and footing drains to an approved drainage system. Rear yard low point area drains and/or storm drain lateral stubs connected to an approved drainage system shall be provided to each lot as necessary to prevent stormwater runoff impacts to adjoining parcels as determined by the city.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should submit a revised stormwater plan for Lots 1-38. Said plans should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.

Per CMC 17.19.040.C.a, storm drainage facilities shall be placed on their own tract or within an open space tract and are to be owned and maintained by the homeowners and/or the HOA.

The preliminary utility plans (Exhibit 11) propose to construct the stormwater detention facility, treatment vault, treatment manhole, and storm control manhole at the southern end of Tract D, which is a private road. The storm detention facility is shown to be in Tract F, which is also the tract for critical areas, Oregon White Oaks, picnic areas, parking stalls, the T-29 public trail, with a sanitary sewer force main easement over said T-29 trail.

Staff recommends a condition of approval that, prior to engineering plan approval, the applicant should submit a revised utility plan/stormwater plans that locate the stormwater detention facility, treatment manhole, treatment vault, storm control manhole, etc. in its own stormwater Tract.

Staff recommends a condition of approval that, prior to final plat approval, the applicant should submit a revised utility plan/stormwater plans that locate the stormwater detention facility, treatment manhole, treatment vault, storm control manhole, etc. in its own stormwater Tract.

Per CMC 14.02.090.1 Stormwater facilities, located within residential subdivisions and short plats, shall be the maintenance responsibility of the applicant for two years after date of final acceptance. The 2-year maintenance period shall run concurrent with the city's required two-year warranty period that begins at final acceptance.

Prior to end of the two-year warranty period, and upon inspection by the city, the applicant shall ensure that a fully functional facility is turned over to the new owners (e.g., homeowners' associations/homeowners). At completion of the 2-year warranty period, the stormwater facilities in

Tracts A, D, and F will be owned and maintained by the Homeowner's Association/homeowners. Per CMC 14.02.C, the City shall have the right-of-entry and authority to inspect of the stormwater facility located in Tract D.

Staff recommends a condition of approval that prior to final plat approval the following notes are to be added to the final plat.

Proposed Plat Notes:

The Stormwater facilities located in Tracts A, D, and F are to be owned and maintained by the homeowner's association / homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.

Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located in Tracts A, D, and F.

FINDINGS: Staff finds that, as conditioned, the applicant can and will make adequate provisions for stormwater control, conveyance, and water quality treatment.

Erosion Control:

In accordance with CMC 14.06 Erosion Control, adequate erosion control measures are to be provided during the site improvements for the proposed development in accordance with the *Camas Design Standards Manual* (CDSM) and Ecology's *Stormwater Management Manual for Western Washington* (SWMMWW).

Per CMC 17.21.030.A installation of erosion prevention / sediment control measures are required per an approved erosion and sediment control plan. The preliminary plans that were submitted with the application, did not include the erosion and sediment control plans.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should be required to submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

Per CMC 17.21.030.C construction of storm drainage facilities required to detain and dispose of stormwater is to commence prior to work on other portions of the project. The city may require the construction of a temporary storm drainage facility that would bypass and protect the permanent facility until such time as the rest of the project is complete and ready for the permanent facility to be brought online.

Per Clark GIS Property Information, the site for the proposed development is approximately 8.84 acres (385,070 SF) in size.

Per CMC 14.06.200 and CMC 17.21.030.B financial security for erosion control, in the amount of 200% of the estimated erosion control items is required prior to land-disturbing activities of one acre or more. The erosion control financial security is to be submitted to the city prior to start of any land-disturbing activities. Additionally, the applicant will be required to provide a copy of both their *NPDES General Construction Stormwater Permit* (GCSWP) and their *Stormwater Pollution Prevention Plan* (SWPPP), which is a requirement of the NPDES GCSWP permit. The NPDES GCSWP permit is issued by the Washington State Department of Ecology for land-disturbing activities of an acre or more.

Staff recommends a condition of approval that prior to any land-disturbing activities, a copy of Ecology's NPDES GCSWP permit, the SWPPP with contractor information, and the financial security for erosion and sediment control are to be submitted to the city.

Staff recommends a condition of approval that prior to any land-disturbing activities, which includes tree cutting, clearing and grading, and an approved set of engineering plans, including the erosion prevention and sediment control measures is required.

FINDINGS: Staff finds that, as conditioned, adequate provisions for erosion control can or will be made.

Sanitary Sewage Disposal:

In accordance with CMC 17.19.040.C.2, sanitary sewers shall be provided and designed in accordance with the city's *Design Standards Manual* (CDSM).

The General Sewer Plan Amendment of April 2010 (GSP) provides a plan on how the Northshore (previously known as the North Urban Growth Area (NUGA)) will be served. The Northshore is divided into six basins served by multiple regional pump stations and major force main and gravity piping systems. The GSP calls for traditional gravity sewer flows (including solids) from all six basins to be directed south and east along the north side of Lacamas Lake.

The subject property is located in Basin 1 as shown in the GSP. As described above, Basin 1 is to be permanently serviced by the regional pump station and force main system along the north side of Lacamas Lake. The city constructed the North Shore Sewer Transmission System (aka NUGA-STS) in 2018. This system begins at the Goodwin Road Pump Station (No. 1), the regional pump station that is located on Goodwin Road just west of the intersection of Ingle Road and Goodwin Road.

The City's General Sewer Plan and Sewer System Development Charge Calculations assume that 66 percent of the permanent system will be constructed by the development community. As such, prior to building permit issuance, the Applicant will be required to provide a proportionate share payment of the NUGA-STS necessary to serve the site. The proportionate share amount has been determined to be $1,235.77 per Lot.

Staff recommends a condition of approval that prior to final plat approval, a plat note addressing the proportionate share amount per Lot, payable to the city for the North Shore Sewer Transmission System (aka NUGA-STS) is warranted.

Proposed Plat Note:
At the time of building permit issuance, each Lot is subject to a $1,235.77 fee per Lot, as the proportionate share contribution for the North Shore Sewer Transmission System, previously known and approved as the 'North Urban Growth Area – Sewer Transmission System' or NUGA-STS. If the NUGA SDC fees are updated to include the proportionate share fee amount of $1,235.77 per Lot, the proportionate share fee will no longer be required.

There is an existing 8-inch gravity sanitary sewer main located in NE 28th Street in the center of the roadway. The preliminary utility plans (Exhibit 11) propose to construct an 8-inch gravity sanitary sewer main, tapped off the existing 8-inch gravity sanitary sewer main in NE 28th Street, south through Street 'A' and the northern section of Street 'B' to a sanitary sewer manhole at the intersection of Street 'B' and private street Tract 'A'. The 8-inch gravity sewer main is then shown to transition to a 2-inch sanitary sewer force main to the end of Tract 'A' and extended south to the cul-de-sacs at the end of Street 'C', Street 'B', and south to the end of the private Street 'D'.

Based on the preliminary utility plans: Lots 1, 2, 3, 4, 37, and 38 will have conventional gravity sewer laterals. The remainder of the development, Lots 5 through 36 will be served by the 2-inch sanitary force main and grinder pump system due to the existing and proposed grades slope away from NE 28th Street. All sanitary sewer laterals are to be laid perpendicularly from the main to the lot. The grinder pumps are to be owned and maintained by the each of the property owners on Lots 5 through 36.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should be required to submit the following:

- Calculations verifying that the sanitary sewer force main is adequately sized for solids and effluent to be pumped up to the highest point in the conventional gravity sewer main.
- An odor control system is to be installed at the sanitary sewer manhole that allows for the transition from conventional gravity to sanitary force main.
- All sanitary sewer laterals are to be laid perpendicularly from the mains to the lots.
- Calculations verifying that the pressure sewer laterals, from the grinder pumps to the force main, are adequately sized for solids and effluent.
- Grinder pumps and laterals are to be per the Camas Design Standards Manual (CDSM).
- The 2-inch sanitary sewer force main in Tract 'A', private street, is to be extended to the eastern property line of Parcel No. 173171000 to allow for future developments.

Staff recommends a condition of approval that prior to final plat approval, the following notes are to be added to the final plat:

- The grinder pumps for Lots 5 through 36 are to be owned and maintained by the property owners.
- A utility easement for access, maintenance, replacement, repair, or extension over and under the sanitary sewer force main located in Tract 'A' and Tract 'D' private roads.

Proposed Plat Notes:

- The grinder pumps for Lots 5 through 36 are to be owned and maintained by the property owners.
- A utility easement for access, maintenance, replacement, repair, or extension over and under the sanitary sewer force main located in Tract 'A' and Tract 'D' private roads.

FINDINGS: Staff finds that, as conditioned, adequate provisions for sanitary sewage disposal can or will be made.

[Existing wells, septic tanks, and septic drain fields]:
Per CMC 17.19.020.A.3 requires abandonment of existing wells, septic tanks, and septic drain fields. Any existing wells, septic tanks and drain fields should be properly decommissioned in accordance with State and County guidelines. If applicable, any water rights associated with the decommissioned well(s) shall be transferred to the City.

The existing single-family residence is served by a well and a septic system. Upon completion of the city water and sewer systems for the proposed development, the existing residence is to be connected to the city's water and sewer mains, and the well and septic system are to be decommissioned.

Staff recommends a condition of approval that prior to final acceptance, the existing single-family residence is to be connected to city water and sewer and any the existing wells and/or septic systems, which includes septic tanks and drain fields, are to be decommissioned and documentation should be provided to the city that said wells and/or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

FINDINGS: Staff finds that, as conditioned, adequate provisions for decommissioning of existing wells and septic systems can or will be made.

3. Provisions have been made for road, utilities, street lighting, street trees, and other improvements that are consistent with the Six-Year Street Plan, the Camas Design Standards Manual and other State adopted standards and plans;

Roads:
Streets for the proposed development shall be designed in accordance with CMC 17.19.040.B Streets and the Camas Design Standards Manual (CDSM).

The proposed development is located on the south side of NE 28th Street, which is designated as an unimproved 3-lane arterial, per the 2016 Road Designation Comprehensive Plan, on both sides of NE 28th Street along the frontage of the proposed development.

[Public Roads]:
Per 17.19.040.B.1 half-width street improvements along an existing roadway is required when it is determined to be appropriate by the city engineer. Half-width street improvements on NE 28th Street are required along the frontage of the proposed development.

Per CDSM *Table 2 – General Guidelines for Geometry of a Roadway*, 3-lane collectors / arterials are to consist of a 74-foot right-of-way width, a 46-foot-wide paved street width, 6-foot-wide sidewalk, 5.5 to 7.5-foot-wide planter strip, and no on-street parking permitted on either side.

The preliminary plat (Exhibit 10) includes the half-width street improvements along the frontage of the proposed development on NE 28th Street, consisting of the minimum 37-foot half width right-of-way, 23—foot paved surface, a 6-foot-wide sidewalk, and an 8-foot-wide planter strip. ***The preliminary plans for half-width street improvements along the frontage of the proposed development meet the minimum street standards for a 3-lane arterial in accordance with the CDSM Table 2.***

Neither the preliminary plat (Exhibit 10) nor the preliminary grading plans (Exhibit 12) provide design information regarding the road transitions to the east and west between the unimproved street widths and improved street widths. The preliminary plat also includes a 10-foot-wide landscape buffer strip and the 6-foot-wide public utility easement (PUE) within the landscape buffer strip. Landscaping and fencing are not permitted within the 6-foot PUE.

Staff recommends a condition of approval that prior to engineering plan approval, the street improvement plans and the grading plans along NE 28th Street, are to provide the following:

a. Sufficient design information for the tapers to the east and west of the frontage improvements to allow for vehicular transitions between unimproved and improved frontages.
b. The 6-foot public utility easement (PUE) is to be located outside of the 10-foot landscape buffer. Neither are to be located within the new right-of-way.

Staff recommends a condition of approval that prior to final plat approval, the final plat is to be revised with the 6-foot public utility easement (PUE) located outside of the 10-foot landscape buffer. Neither are to be located within the new right-of-way.

Per CDSM *Table 3 - Access Spacing Standards*, t*he access spacing on an arterial is a minimum of 660-feet and a maximum of 1,000-feet.*

The future access to the proposed development, Street 'A' is located approximately 880-feet east of the intersection of NE 28th Street and NE Ingle Road; and approximately 1,140-feet west of the intersection of NE 28th Street and N Boxwood Street. The proposed access road Street 'A' is located as close to the eastern property line as possible. As shown on the preliminary plat (Exhibit 10), ***the proposed location of the intersection of future Street 'A' and existing NE Hargrave Street is supported by the City Engineer.***

Per CMC 17.19.040.B.5 *Dedication of additional right-of-way may be required for a development when it is necessary to meet the minimum street width standards or when lack of such dedication would cause or contribute to an unsafe road or intersection.*

The existing right-of-way (ROW) width along the frontage of the proposed development is approximately 67-feet. The preliminary plat (Exhibit 10) shows the half street right-of-way width of 37-feet, which requires the applicant to dedicate approximately 4-feet of right-of-way width that will allow for the 3-lane arterial consisting of a total right-of-way width of 74-feet.

Staff recommends a condition of approval that prior to engineering plan approval, the street improvement plans are to be submitted with the additional 4-feet of right-of-way on NE 28th Street and the street sections in accordance with CDSM Street Detail ST5 3 Lane Collector / Arterial. The applicant is required to construct a 37-foot-wide full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk.

Staff recommends a condition of approval that prior to final plat approval, the frontage improvements are to include the additional 4-foot right-of-way dedication along NE 28th Street that results in the 37-foot right-of-way, 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk.

Per CMC 17.19.040.B.12.e *curb return radii shall be no less that thirty-five feet on arterial and collector streets, and no less than twenty-five feet on all other streets.*

The preliminary plat (Exhibit 10) does not include any curb radii information.

Staff recommends a condition of approval that prior to engineering plan approval, the site improvement plans are to be submitted with the minimum 35-foot curb radii on both sides of the access road at the intersection of Street 'A' and NE 28th Street.

Staff recommends a condition of approval that prior to final plat approval, the preliminary plat is to be revised with the minimum 35-foot curb radii on both sides of the access road at the intersection of Street 'A' and NE 28th Street.

[Interior Public Roads]:
Street naming is the responsibility of the Building Official. The street names, as shown on the preliminary plat (Exhibit 10) will be revised per the Building Official. These names are subject to change during the engineering plan review process.

Staff recommends a condition of approval that prior to engineering plan approval, the future street names, public and private, are to be revised in accordance to the street names as determined by the Building Official.

Staff recommends a condition of approval that prior to final plat approval, the preliminary plat is to be revised with the final street names as determined by the Building Official.

Per CDSM Table 2 – General Guidelines for Geometry of a Roadway, a 2-lane local neighborhood road with a 52-foot-wide right-of-way width, a 28-foot paved surface, 5-foot-wide detached sidewalks and 5 to 7-foot planter strips on both sides, and parking permitted on one side only, requires approval from the city engineer. ***The city engineering supports the proposed 52-foot public road.***

The preliminary plat (Exhibit 10) proposes to construct the future interior public roads, Street 'A', Street 'B', and Street 'C' in accordance with CDSM Table 2 – General Guidelines for Geometry of a Roadway, 2-lane local neighborhood road with 52-foot right-of-way width.

Staff recommends a condition of approval that prior to engineering plan approval a complete set of street improvement plans are to be submitted for review and approval.

Per CMC 17.19.040.B.12.e *curb return radii shall be no less that thirty-five feet on arterial and collector streets, and no less than twenty-five feet on all other streets.*

Staff recommends a condition of approval that prior to engineering plan approval, the site improvement plans are to be submitted with the minimum 25-foot curb radii on both sides of the road at the intersections of Street 'A' and Street 'B'; Street 'B' and Street 'C'; Street 'B' and Tract 'A'; Street 'B' and Tract B; and Street 'B' and Tract D.

Staff recommends a condition of approval that prior to final plat approval, the preliminary plat is to be revised with the minimum 25-foot curb radii on both sides of the road at the intersections of Street 'A' and Street 'B'; Street 'B' and Street 'C'; Street 'B' and Tract 'A'; Street 'B' and Tract B; and Street 'B' and Tract D.

Per CMC 17.19.040.B.10.b.i Block lengths shall not exceed the maximum access spacing for the roadway class per the city's Design Standards Manual. The maximum block length for a local roadway classification is 600-feet. *The interior local block lengths do not exceed the maximum 600-foot block length standard for a local roadway classification*.

[Private Roads]:
Per CDSM Table 1 – Guidelines for Geometry of Private Roadway, access to four dwelling units or less requires a minimum tract width of 20-feet, a minimum 12-foot-wide paved surface, and no parking on either side. Additionally, per Note 3, dead-end roads in excess of 150-feet, as measured from the centerline of the adjacent road, require a dead-end turnaround.

The private roads are shown to be located on Tract A, Tract B, Tract C, and Tract D. Except for Tract D, the preliminary plat does not provide design information for tract width or paved surface width.

Private Road - Tract A

Per the preliminary plat (Exhibit 10) Tract A will provide access to future Lots 5, 6, and 7, and to the existing single-family residence on Parcel No. 173171000 on the west side. Per the preliminary plat, future private street Tract A is approximately 200-feet in length as measured from the centerline of Street 'B', is in excess of 150-feet to the end of the private road and is approximately a 20-foot-wide tract, with 20-feet of paved surface. ***The proposed private street section for Tract A meets the Minimum Private Street Standard for access to four dwelling units or less.***

Per CDSM Table 1 – Guidelines for Geometry of Private Roadway, Note 3, dead-end roads in excess of 150-feet, as measured from the centerline of the adjacent road, require a dead-end turnaround.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to work with the Fire Marshal's Office and engineering staff to provide an acceptable dead-end turnaround at the west end of Tract A.

Private Road - Tract B

Per the preliminary plat (Exhibit 10) Tract B will provide access to NE 28th Street via the private driveway and Street 'B' and Street 'A' for the existing single-family residence on Parcel No. 17320600. Per the preliminary plat, future private street Tract B is approximately 123-feet in length as measured from the

centerline of Street 'B' and is approximately a 20-foot-wide tract, with 20-feet of paved surface. ***The proposed private street section for Tract B meets the Minimum Private Street Standard for access to four dwelling units or less.***

Private Road - Tract C

Per the preliminary plat (Exhibit 10) Tract C will provide access to future Lots 15 and 16. Per the preliminary plat, future private street Tract C is approximately 100-feet in length as measured from the centerline of the cul-de-sac on Street 'C' and consists of a 25-foot-wide tract, with 25-feet of paved surface. ***The proposed private street section for Tract C meets the Minimum Private Street Standard for access to four dwelling units or less.***

Private Road - Tract D

Per CDSM Table 1 – Guidelines for Geometry of Private Roadway, Private Street Standard C: access to five or more dwelling units greater that 100-feet but less than 300-feet requires a minimum tract width of 42-feet, a minimum 28-foot-wide paved surface, a 5-foot detached sidewalk and planter strip on one side, and parking on one side only. Additionally, per Note 3, dead-end roads in excess of 150-feet, as measured from the centerline of the adjacent road, require a dead-end turnaround.

Per the preliminary plat (Exhibit 10) Tract D will provide access to six future Lots 21 through 26 and the stormwater facility at the south end of the private road. Per the preliminary plat, future private street Tract D is approximately 224-feet in length as measured from the centerline of the cul-de-sac on Street 'B', which is in excess of 150-feet to the end of the private road; and is shown as a 20-foot-wide tract, with 20-feet of paved surface. ***The proposed private street section for Tract D does not meet the Minimum Private Street Standard C for access to five or more dwelling units greater than 100-feet.***

Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to submit site improvement plans with private road, Tract D, meeting Private Street Standard C with a 42-foot-wide tract, 28-foot paved surface, a 5-foot-wide sidewalk and planter strip on one side. On-street parking is permitted on one side only.

Per CDSM Table 1 – Guidelines for Geometry of Private Roadway, Note 3, dead-end roads in excess of 150-feet, as measured from the centerline of the adjacent road, require a dead-end turnaround. The preliminary plat (Exhibit 10) shows a dead-end turnaround between Lots 25 and 26. The dead-end as shown is approximately 60-feet in length, and 20-feet-wide. Curb radii information is not shown and is to be a minimum 25-foot radii on both sides.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to submit site improvement plans with the minimum 25-foot radii on both sides of the dead-end turnaround on private road, Tract D.

Staff recommends a condition of approval that prior to final plat approval, the applicant is to submit revised preliminary plat plans with the minimum 25-foot radii on both sides of the dead-end turnaround on private road, Tract D.

Per CMC 17.19.040.A.2 Adequate and reasonable provisions are made for ownership, maintenance, and repair of all utilities and the proposed private streets.

Staff recommends a condition of approval that prior to final plat approval, a note is to be added to the plat stating the Tract A, Tract B, Tract C, and Tract D; are to be owned and maintained by the property owners and/or homeowners association (HOA).

Proposed Plat Note: Tract A, Tract B, Tract C, and Tract D; are to be owned and maintained by the property owners and/or homeowners association (HOA).

Per CMC 17.19.040.A.7 Access requirements for recycle service, garbage service, and emergency vehicles are to be provided.

Staff recommends a condition of approval that prior to engineering plan approval, the street plans and the preliminary plat are to be revised to provide for a dead-end turnaround at future Lot 7 on the west end of Tract A. The applicant is to work with engineering and the Fire Marshal for an acceptable dead-end turnaround to accommodate emergency vehicles.

Garbage and recycling containers for those Lots who take access via the private streets on Tract A, Tract C, and Tract D; are to be placed at the public right-of-way for pickup.

Per CMC 17.19.040.A.8 Provisions for adequate parking enforcement are to be recorded within a private covenant to ensure emergency vehicle access. These provisions shall be noted on the final plat (e.g., Towing service).

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should provide a design for a 'No Parking and Towing' sign for review and approval. Said sign is to include contact information for a private towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.

Staff recommends a condition of approval that prior to final acceptance the applicant should be required to install the 'No Parking and Towing' signs.

Staff recommends a condition of approval that prior to final plat approval, a note is to be added to the plat stating that 'on-street parking is prohibited on both sides of Tract A, B, and C.

Proposed Plat Note: Tract A, Tract B, and Tract C: On-street parking is prohibited on both sides of the street.

<u>Utilities, Street Lighting, Street Trees, and Other Improvements</u>:

[Street lighting]:
LED Street lighting is to be designed and installed along all street frontages in accordance with the Camas Design Standards Manual (CDSM) – Standards for Street Lighting.

The locations for streetlights are to be coordinated with the locations of other site features, such as street trees, driveways, and other utilities. Per CDSM, private streets in excess of 100-feet in length and serving more than five dwelling units are required to have streetlights. Any streetlights proposed for private streets are required to be metered separately and are to be owned and maintained by the HOA.

Staff recommends a condition of approval that prior to engineering plan approval all streetlight locations are to be shown on the street, utility, and landscape plans. Any streetlights provided for private streets are required to be metered separately and are to be owned and maintained by the HOA / homeowners.

Staff recommends a condition of approval that prior to the applicant's submittal of electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street Trees and Landscaping]:
CMC 17.19.030 (F1) requires one 2-inch diameter street tree in the planter strip for each dwelling unit. The preliminary landscape plan shows each proposed lot is provided with at least one street tree; most are shown with two.

Staff recommends a condition of approval that prior to final acceptance all landscaping be installed or bonded for and all proposed street trees and landscaping are to be per the CDSM Landscape Standards Plant Materials list.

Staff recommends a condition of approval that prior to engineering approval, the applicant is required to show proposed driveway locations for each lot to ensure that street trees are not impacted.

The street tree plantings and other landscaping as discussed throughout this report should be included on the landscaping plans with the engineering plan submittal for the proposed development.

Staff recommends a condition of approval that prior to engineering plan approval the applicant is to submit a final landscape plan for review and approval that is consistent with the landscaping standards in CMC Chapter 18.13, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list.

Landscaping adjacent to or within tracts should be installed prior to final acceptance per CMC 17.19.030.F.3. Street trees adjacent to lots should be installed prior to final occupancy or bonded for per CMC 17.19.030.F.4.

[Storm Facility Landscaping]:
CMC 17.19.030.F.6 requires that storm drainage facilities within 30-feet from any street or accessory structure to be landscaped with a 10-foot L2 buffer. The proposed storm facility located in Tract F should be landscaped with a L2 buffer at its lot lines and the landscaping should be shown on the final landscape plans.

Per the CDSM, the storm facilities are to be fenced with a maximum height 6-foot fence with top rail and a minimum 10-foot-wide double gate for access. The preliminary stormwater plans do not provide for a dedicated stormwater Tract for the stormwater detention facility in Tract F, nor do the plans include fencing or gated access to the future stormwater facility shown to be located in Tract F.

Staff recommends a condition of approval that prior to engineering plan approval the applicant is to submit revised stormwater facility plans that provide for a minimum 6-foot-high black vinyl coated chain link fence with top rail installed along the stormwater facility located in Tract F where the tract abuts the end of the private road on Tract D. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the paved access road to the facility and a minimum 4-foot-wide man gate for inspection access.

FINDING: Staff finds that, as conditioned, the applicant can or will make adequate provisions as conditioned for roads, utilities, street lighting, street trees, and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans.

4. Provisions have been made for dedications, easements, and reservations;

The applicant is conditioned to dedicate an additional 4-foot right-of-way width on NE 28th Street to provide the full half-width of 37-feet right-of-way required for the proposed frontage improvements and the 52-foot right-of-way widths for the internal public roads required to serve the proposed development, as shown on the preliminary plats.

Proposed Tracts A, B, C, and D are identified as private roads on the preliminary plat. A public sanitary sewer main and water main will be located within private road Tracts A and D. Tracts A and D require a blanket utility easement to the city over and under Tracts A and D for maintenance, inspections, and repairs.

Tract D provides access for maintenance and inspections of the stormwater detention facility located in Tract F; as such the applicant is required to provide a blanket stormwater access and inspection easement over the proposed private road Tract D at the time of final platting.

A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make provisions in the CC&Rs for ownership and maintenance of the storm drainage facilities located in Tracts D and F; fencing, walls, landscaping, irrigation, private roads on Tract A, Tract B, Tract C, and Tract D; and Tract E that are outside of the City's right-of-way. Further, all necessary easements and dedications should be noted on the final plat.

> **FINDING:** Staff finds that, as conditioned, adequate provisions for dedications, easements and reservations can or will be made by the applicant at the time of final platting.

5. The design, shape, and orientation of the proposed lots are appropriate to the proposed use.

CMC 18.09.040 Table 1 Lot Dimensional Standards

The subject property is situated in the R-7.5 - Single-Family Residential zone which permits a minimum lot size of 6,000 square-feet, a maximum lot size of 12,000 square-feet, and an average lot size of 7,500 square-feet. The maximum density for the R-7.5 zone is 5.8 dwelling units per acre.

As previously stated, there is an existing single-family residential structure shown on Lot 26 that is proposed to be retained. Lot 26 is proposed to be 12,256-square-feet in size where the maximum lot size for the R-7.5 zone is 9,000-square-feet. According to CMC 18.09.040 Table 1, footnote 3, for parcels with an existing dwelling, a one-time exception may be allowed to partition from the parent parcel a lot that exceeds the maximum lot size permitted in the underlying zone. Any further partitioning of the parent parcel or the oversized lot must comply with the lot size requirements of the underling zone.

The applicant's narrative notes a request to utilize density transfer standards and is requesting smaller lot sizes due to the open space dedication provided. As per CMC 18.09.060.C, density transfer standards are permitted to be used when a land division proposed to set aside a tract for the protection of critical area, natural open space, natural open space network or network connector, or a recreational area is set aside within a proposed development. As shown on the proposed plat, the total site area includes 11.31 acres, with approximately 3.94 acres being set aside for critical areas and open space, leaving the net developable area at 7.37 acres. The proposed subdivision includes a total of 38 units, distributed over 7.37 acres, with a proposed density at 5.4 units per acre. The preliminary plat indicates there is approximately 4.35 acres set aside as "recreational open space". Tract E and F are shown to include pedestrian paths, a picnic area and landscaping.

As noted in section 18.09.060.D, where a recreational tract includes at least 0.5 acres of contiguous area, the city may provide additional or negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards under CMC 18.09.040, Table 1 and 2. The applicant is proposing lots that range in size from 4,541 – 12,256 square-feet, with an average lot size of 5,816 square-feet and a proposed density of 5.2 dwelling units per acre. The applicant is requesting additional flexibility per section 18.09.060.D to allow for a minimum lot width of 45 feet where typically the minimum lot width in the R-7.5 zone with a density transfer bonus would be 60-feet. As noted in the applicant's narrative, the proposal for the decreased lot width was presented to staff prior to the formal application submittal and staff supports the requested 45-foot minimum lot width, provided that adequate parking can be provided within the development.

The project narrative indicates as per CMC 17.19.040.B.10.e one additional off-street parking space is required for every five units when the average lot size is less than 7,400-square-feet. Within the proposed

38 lots, 8 off-street parking spaces are required. The site plan shows a total of 8 parking spaces are located on tract "F", adjacent to Lot 20 and near the main open space area. These parking spaces meet the standard parking space dimensions and have a width of 9-feet and a depth of at least 18-feet.

The applicant proposes the subdivision be reviewed under the density transfer standards since the preliminary plan includes critical areas and recreational amenities exceeding ½ acre in size, including a trail and picnic benches. The applicant is requesting flexibility in the following Code requirements:

- Reduced average lot size of 5,816 square-feet
- Reduced minimum lot size of 4,500 square-feet
- Reduced minimum lot width of 45-feet
- Reduced minimum front or front porch setback of 15-feet
- Reduced minimum garage setback of 20-feet
- Reduced minimum rear setback of 15-feet
- Increased lot coverage of 50% for single-story homes and 55% for two-story homes

The applicant's narrative states "the proposed requests are reasonable, and the minimum required to attain the allowed density on the project site while still providing a mix of marketable homes. The reductions stated above are proposed to replace the standards of Camas Municipal Code 18.09.040. In return for flexibility to lot standards the applicant will provide trails and picnic tables within the recreational open space. Pedestrian paths are proposed to connect the two proposed cul-de-sacs as well as stub to the east and west to be extended with future development. Landscaping will be provided within the park area and will support a range of recreational activities."

CMC 18.09.040 Table 2 Setbacks

The proposed lots within the development range in size form 4,541 – 12,256 square-feet. Setbacks are based on lot size; therefore all of the lots should comply with the setbacks for the lots between 5,000 and 11,999 square-feet per CMC.09.060.D. The applicant is requesting to utilize the density transfer standards and is proposing smaller lot sizes and setbacks due to the open space dedication provided.

The applicant's narrative includes the tables below to illustrate the proposed density transfer requests with respect to CMC 18.09.040 – Density and Dimensions as well as Building Setbacks for Single-Family Residential Zones.

Table 1 CMC 18.09.040– Density and Dimensions for Single-family Residential Zones

	R-7.5	Density Transfer	Proposed
Maximum density (dwelling units/net acre)	5.8	5.8	5.42
Average lot area (square feet)	7,500	-	**5,816***
Minimum lot size (square feet)	6,000	5,250	**4,541***
Maximum lot size (square feet)	12,000	9,000	8,581
Minimum lot width (feet)	70	60	**45***
Minimum lot depth (feet)	90	80	100
Maximum building lot coverage	40%	40%	**50% & 55%***
Maximum building height (feet)	35	35	35

*Additional flexibility requested per CMC 18.09.060.D

Table 2 CMC 18.09.040 – Building Setbacks for Single-family Residential Zones	
Minimum front yard or front porch setback	**20'***
Minimum side yard	5'
Minimum side yard flanking a street and corner lot rear yard	10'
Minimum rear yard	**25'***
Minimum lot frontage on a cul-de-sac or curve	30'

*Additional flexibility requested per CMC 18.09.060.D

The applicant's narrative indicates that the proposal qualifies to be reviewed under the density transfer standards due to the face that the proposal includes critical areas and recreational tracts within the land division. The open space tract is 3.9 acres in size and includes recreational amenities including trails and picnic benches. The site contains critical area including wetlands, buffers and a grove of trees that are proposed to be retained within the open space tract.

6. The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;

CMC 18.13.045 and CMC 18.13.051 Tree Density/Tree Survey:
A minimum of 20 tree units (TU) per net developable acre is required for residential developments per *CMC 18.13.051(A) Table 1 – Required Tree Density* and should be incorporated into the overall landscape plan. The preliminary landscape plan shows that the 11.3-acre site is required to have a total of 226 tree units. The tree survey prepared by Arbor Science Tree Care dated May 2, 2025, and included in the project submittal, indicates that the sites current tree density is 999 tree units, with the proposed removals calculating out to 326 tree units. This leaves a net density of 673 tree units to be preserved and protected. A total of 754 tree units will be provided within the proposed development between the new plantings and existing trees to be retained. Staff finds the proposed landscape plan exceeds the minimum tree density requirements.

As per CMC 18.13, the applicant is required to submit a final landscape, tree, and vegetation plan to the City for review and approval prior to engineering plan approval. Plants utilized will need to be per the approved City's Tree list and per the Camas Design Manual planting specifications and landscape notes. For plants not on the approved City list, a characteristic card should be submitted to the City for review and approval. Irrigation and landscaping should be installed or bonded for prior to final acceptance per CMC 17.19.030.F.3.

7. Appropriate provisions are made to address all impacts identified by the transportation impact study;

[Traffic Impact Analysis]:
Per CMC 18.18.040.E a Transportation Impact Analysis (TIS/TIA) may be required when a development will generate 200 or greater average daily trips (ADTs). The proposed development is located east of NE Ingle Road, south of NE 28th Street, and west of NE 232nd Avenue. The proposed development will generate approximately 348 ADTs, which triggered the requirement for a TIA.

A transportation impact analysis (TIA) (Exhibit 3) dated April 23, 2025, was prepared by Lancaster Mobley for the approximately 11.76 acre site for the proposed development of up to 37 single-family-homes. The report used the trip generation rates from the *ITE Trip Generation Manual* (11th Edition, 2021), ITE code #210 Single-Family Detached Housing, to determine the number of trips generated per weekday. The trip

generation calculations show that the proposed project is estimated to have a net increase in trip generation of 26 AM Peak Hour trips (7 In / 19 Out), 35 PM Peak Hour trips (22 In / 13 Out), and a total of 348 average daily trips (ADTs).

Sight Distance Evaluation
Per the TIA (Exhibit 3), pages 18 & 19), the intersection sight distance was measured at the proposed access road onto NE 28th Street and evaluated in accordance with the standards established in '*A Policy on Geometric Design of Highways and Streets'*.

The posted speed limit on NE 28th Street is signed 40 MPH in both directions between NE 232 Avenue and NE Ingle Road. NE 28th Street is an existing three-lane cross-section along the sight frontage of the proposed development. Based on these factors:

- the following minimum intersection and stopping sight distances are applicable to the proposed site access intersection:
- Intersection Sight Distance (Site Egress Left-turns): 445 feet to the east.
- Intersection Sight Distance (Site Egress Right-turns): 385 feet to the west.
- Stopping Sight Distance: 320 feet to the east, considering the major-street westbound approach grade is approximately 3.4% downhill over a 350-foot distance.
- Stopping Sight Distance: 305 feet to the west, considering the major-street eastbound approach grade is less than 3.0% over a 350-foot distance.

Based on the sight distance analysis, adequate sight distances and stopping distances are available at the proposed site access intersection of NE 28th Street and future Street 'A' to ensure safe and efficient operation along NE 28th Street. Therefore, no mitigation for sight distance is necessary or recommended. ***Staff concurs.***

> Staff recommends a condition of approval that prior to engineering plan approval the corner sight-distance triangles / site vision clearance triangles, at the intersection of the future Street 'A' and NE 28th Street, are to be shown on the final engineering plans and landscaping plans.

Left-turn Lane Warrants
Per the TIA (Exhibit 3, page 19), left-turn lane warrants were evaluated at the intersection of NE 28th Street and the future Street 'A' to the proposed development. A left-turn refuge lane is primarily a safety consideration for the major-street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants used were developed from the *National Cooperative Highway Research Project's* (NCHRP) *Report 457*. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through lanes.

Based on the analysis, left-turn lane warrants are not projected to be met at the site access intersection of NE 28th Street and future Street 'A' under the 2027 site buildout year. Accordingly, no new turn lanes are necessary or recommended as part of the proposed Reserve at Green Mountain project. ***Staff concurs.***

All-Way Stop-Control Warrants
Stop-Control warrants are adequately discussed in the TIA (Exhibit 3, pages 20 & 21). The applicable study intersections were evaluated and reviewed per the *Manual of Uniform Traffic Control Devices for Streets and Highways (MUTCD), Section 2B.12 All-Way Stop Control.*

Based on the review of all-way stop-control warrants, the installation of all-way stop-controls at any of the applicable study intersections by the 2027 site buildout year is not necessary or recommended.

Therefore, no all-way stop-control mitigation at the study intersections is recommended as part of the proposed development. ***Staff concurs.***

The conclusions noted in the Transportation Impact Analysis (Exhibit 3) on page 27, are as follows:

CONCLUSIONS

- *The proposed development is projected to impact on nine of the transportation facilities where proportionate share fees are being collected by the City of Vancouver. The proposed development application will need to contribute a proportionate share fee of $34,199 toward these transportation improvement projects.* ***Staff concurs. A condition of approval is warranted.***
- *No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.* ***Staff Concurs.***
- *Adequate intersection and stopping sight distances are available at the proposed site access intersection to allow for safe and efficient operation along NE 28th Street. No sight distance related mitigation is necessary or recommended.* ***Staff Concurs.***
- *Left-turn Lane, traffic signal, and all-way stop-control warrants are not projected to be met at any of the applicable study intersections under any analysis scenario through the 2027 site buildout year. Accordingly, no new turn lanes or revisions to traffic controls are necessary or recommended as part of the proposed Reserve at Green Mountain project.* ***Staff Concurs.***
- *The proposed development will reconstruct its associated street frontage with NE 28th Street to include pedestrian and bicycle facilities in accordance with City of Camas Street standards. Additionally, appropriate pedestrian and bicycle facilities will be constructed within site internal streets to accommodate student pickup/drop-off via school bus. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Reserve at Green Mountain subdivision, and no further mitigation to pedestrian and bicycle facilities are necessary and recommended.* ***Staff Concurs.***
- *All study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application.* ***Staff Concurs.***
- *The northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. However, this excess queue can be accommodated by the northeast bound through lane without extending back to any other public intersection or driveway along NE Goodwin Road. Limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur due to this queuing. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development.* ***Staff Concurs.***

The applicant's TIA was to evaluate the number of PM Peak Hour trips through City of Vancouver identified proportionate share intersections in order to help fund intersection improvement projects. Based on Table 5, page 10 of the TIA, dated April 23, 2025, the proportionate share fees to the City of Vancouver will be as follows:

Proportionate Share Project Name	Fee Rate	Number of Trips	Proportionate Share Cost
NE Fourth Plain Blvd. at NE 152nd Ave. (Signal)	$333.00 per PM peak hour trip	3	$999.00
SE 192nd Ave & NE 13th Street	$400 per PM peak hour trip	15	$6,000.00
SE 192nd Ave & SE 34th St	$150 per PM peak hour trip	4	$600.00
SE 192nd Ave & WB SR-14 ramps	$2,000 per PM peak hour trip	2	$4,000.00
NE 172nd Avenue at NE 18th Street	$300 per PM peak hour trip	3	$900.00
NE 179th Place at NE 18th Street	$9,00 per PM peak hour trip	4	$3,600.00
NE 187th Avenue at NE 18th Street	$1,200 per PM peak hour trip	5	$6,000.00
NE 192nd Avenue at NE 9th Street	$1,100 per PM peak hour trip	10	$11,000.00
NE 187th Avenue at SE 1st Street	$1,100 per PM peak hour trip	1	$1,100.00
Total Proportionate Share Cost (COV proportionate share intersections with zero (0) PM peak hour trips are included in the TIA, Table 5, page 10)			**$34,199.00**

Staff recommends a condition of approval that prior to final acceptance the applicant is required to pay the proportionate share amount of $34,199.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

FINDING: Staff finds that this development, as conditioned, can or will meet any impacts identified by the transportation impact study.

8. Appropriate provisions for maintenance of commonly owned private facilities have been made;

Per CMC 14.02.090.A.1 Stormwater facilities, located within residential subdivisions and short plats, shall be the maintenance responsibility of the applicant for two-years after the date of final acceptance. This maintenance period shall run concurrent with the city's required two-year warranty period that begins at final acceptance.

Per CMC 14.02090.C, the City shall have the right-of-entry and authority to inspect of the stormwater facilities for compliance with this chapter. A note is to be added to the final plat granted the city right-of-entry for inspection purposes. A condition of approval is warranted.

Per CMC 17.19.040.A.2 the HOA and/or homeowners are responsible for the ownership and maintenance of the private streets. A note is to be added to the final plat stating that private Tracts A, B, C, and D are to be owned and maintained by the individual property owners and/or homeowners association (HOA). A condition of approval is warranted.

> **FINDING:** Staff finds that, as conditioned, this development can or will meet the appropriate provisions for maintenance of private facilities.

9. Appropriate provisions in accordance with RCW 58.17.110, are made for (a) the public health, safety, and general welfare, and (b)The public use and interest will be served by the platting of such subdivision and dedication.

> **FINDING:** As discussed throughout this report, staff finds that the subdivision can be conditioned to provide the appropriate provisions for public health, safety, general welfare, and assure the public interest is served.

10. The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state, and local environmental acts, and ordinances in accordance with RCW36.70B.030.

> **FINDINGS:** Staff concurs that the proposed subdivision can or will meet the requirements of RCW 58.17 and other applicable state and local laws that are in at the time of final platting. The final plat will be processed in accordance with the requirements of CMC 17.21.060.

PUBLIC COMMENTS

As of the writing of this staff report, staff received written public comments from the Washington Department of Fish & Wildlife (Exhibit 31) regarding existing Oregon white oaks, the Department of Archeology & Historic Preservation (DAHP) (Exhibit 29), and the Cowlitz Indian Tribe (Exhibit 30) regarding the probability of potential artifacts onsite. These comments are addressed throughout the staff report.

CONCLUSION

Based on the above findings and discussion provided in this staff report, staff concludes that "The Reserve at Green Mountain" Subdivision (SUB25-1004) should be approved because it complies with the applicable standards if all the conditions of approval are met.

RECOMMENDATION

Staff recommends APPROVAL of the preliminary plat for "The Reserve at Green Mountain" Subdivision (SUB25-1004) subject to the following conditions of approval:

CONDITIONS OF APPROVAL

Standard Conditions:

1. Engineering site improvement plans shall be prepared in accordance with the City of Camas Design Standards Manual (CDSM), which includes the North Shore Design Standards, and CMC 17.19.040.
2. The engineering site improvement plans shall be prepared by a licensed civil engineer in Washington State and submitted to the City's Community Development Engineering Department for review and approval.
3. Per CMC 17.19.040.C.1 and 1.a: All utilities designed to serve the development shall be placed underground. Those utilities to be located beneath paved surfaces, including all service connections, shall be installed prior to application of any surface materials.
4. The installation of public improvements shall be in accordance with CMC 17.21 Procedures for Public Improvements.
5. After the land-use decision is issued, the applicant is to submit the Civil construction plans via the online portal at *www.cityofcamas.us/Permits/Civil Construction Application*.
6. Community Development (CDEV) Engineering shall collect a total 3% plan review and construction inspection (PR&CI) fee for the proposed development.
    a. Payment of the 1% plan review (PR) fee is required prior to start of initial plan review. Staff will review the preliminary engineer's estimate and invoice the applicant via the online portal.
    b. Payment of the 2% construction inspection (CI) fee is required prior to final plan approval. Staff will invoice the applicant via the online portal.
    c. Under no circumstances will the applicant be allowed to begin land-disturbing activities prior to engineering plan approval.
7. If applicable, existing wells, septic tanks, and septic drain fields shall be decommissioned in accordance with state and county guidelines per CMC 17.19.020.
8. Prior to any land-disturbing activities of an acre or more, the applicant shall submit a copy of the *NPDES General Construction Stormwater Permit* (GCSWP), which is issued by the Washington State Dept. of Ecology, and the *Stormwater Pollution Prevention Plan* (SWPPP), which is required as a component of the NPDES GCSWP permit.
9. Prior to commencing any land-disturbing activities of an acre or more, the applicant shall submit an Erosion Control Bond in the amount of 200% of the cost for erosion control (ESC) measures, per CMC 14.06.200. Staff will provide a letter to the applicant with the required ESC amount.
10. If any item of archaeological interest is uncovered during a permitted land-disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
11. The applicant shall comply with the recommendations in the geotechnical report that was prepared by True North Geotechnical, dated April 2025, to minimize any potential hazards associated with construction.
12. Any entrance structures or signs proposed or required for this project will be reviewed and approved by the city.
    a. All designs will be in accordance with applicable City codes.
    b. The maintenance of the entrance structure will be the responsibility of the homeowners.
13. Final plat submittals shall meet the requirements of the CMC 17.11.060, CMC 17.01.050, and the Camas Design Standards Manual.
14. A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make

provisions in the CC&Rs for ownership and maintenance of the private storm drainage systems, open spaces, retaining walls, fencing, walls, landscaping, irrigation, private roads, and tracts or easements outside of the City's right-of-way if applicable. Further, all necessary easements and dedications should be noted on the final plat.

15. Provisions for parking enforcement on private Tracts/access driveways, acceptable to the Fire Marshal, shall be included in the CC&Rs at the time of final platting.
16. Prior to final acceptance, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil.
17. As a component for final acceptance, final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. The as-built cover sheet is to be the originally approved cover sheet signed by the City Engineer.
    b. As-builts are to be submitted as PDFs.
    c. As-builts are to be submitted in either AutoCad or Carlson formats.
18. Per CMC 17.21.050.B.2 and prior to final acceptance a 2-year warranty maintenance bond is to be submitted for all public improvements.
    a. Per CMC 17.21.070.A Upon final acceptance of the development improvements the two-year (2) warranty bond commences.
19. Per CMC 17.21.070.E A letter of final acceptance will be issued once all items listed in 17.21.070.B-C have been completed and approved by the city.
20. Per CMC 18.18.070.B, prior to the issuance of final occupancy permits, all public and private improvements shall be completed in accordance with CMC 17.21.070 Final Acceptance.
21. Automatic fire sprinklers installed per NFPA 13D or 13R shall be required in all new residential structures.
22. The applicant will be responsible for maintenance of all private improvements, including but not limited to stormwater facilities Tracts and easements, Open Space Tracts, parking areas, landscaping and irrigation, and any retaining walls.
23. Per CMC 17.21.060.H Permits for one sales office and/or one model home per plat or phase may be issued after the final plat is recorded, and prior to final acceptance. Building permit applications for any other residential buildings will not be accepted until after final acceptance.
24. At the time of building permit approval, the applicant shall pay the appropriate impact fees in accordance with the provisions of CMC 3.88.
25. The applicant shall take appropriate measures to ensure landscaping success for a minimum of three years after issuance of Certificate of Occupancy. If plantings fail to survive, the property owner shall promptly replace them.
26. Unless construction of this site commences within five (5) years of issuance of this decision, this permit will expire.

Special Conditions of Approval:

Planning:

27. A site-specific Inadvertent Discovery Plan shall be prepared for the proposed project and submitted to City of Camas Planning Division to comply with recommendations of DAPH and the Cowlitz Indian Tribe.
28. If potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.
29. The recommendations provided by the Washington Department of Fish & Wildlife shall be complied with.
30. The recommendations provided by the Department of Archeology and Historic Preservation shall be complied with.
31. The recommendations provided by the Cowlitz Indian Tribe shall be complied with
32. The recommendations in the Critical Areas Report, specifically the Buffer Mitigation Plan, shall be followed.
33. The recommendations in the geotechnical report shall be followed.
34. The installation of temporary construction fencing prior to construction that clearly marks in the field critical area buffers (i.e., wetlands, Oregon White Oak) and fencing should remain throughout permitted construction activities.
35. The trees identified for preservation shall comply with the tree protection recommendations contained in the Critical Areas report. Any required revisions to the site plan, such as building setbacks and/or site improvements, will require an updated Tree Survey for review and approval prior to Engineering Plan approval and will be conditioned as such.
36. If any exterior retaining walls facing the public right-of-way are proposed, they shall be "set back a distance of one foot for every foot in height of a fence in excess of allowed height" per CMC 18.17.060.D. and provide additional landscaping consisting of groundcover, shrubs, and trees.

<u>Prior to Engineering Plan Approval:</u>

Planning:

37. A final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC Chapter 18.13 should be submitted to the City for review and approval prior to engineering plan approval. Plants utilized will need to be per the approved City's Plant list and per the Camas Design Manual planting specifications and landscape notes. For plants not on the approved City list, a characteristic card should be submitted to the City for review and approval. Irrigation and landscaping should be installed or bonded for prior to final acceptance per CMC 17.19.030.F.3.

Engineering*:*

[Water]

38. The applicant shall submit revised water utility plans to include the following:
    a. The new 8-inch DI water main from NE 28th Street south throughout the development to the proposed cul-de-sacs on Street 'B' and Street 'C', and the proposed private streets in Street 'D' and Tract 'A'.
    b. The 8-inch DI water main in future Tract 'A' is to be extended to a blowoff valve assembly at the westernmost property line of the proposed development for the benefit of any future development on Parcel No. 173171000.

c. Dead-end blowoff valves are also required at the future cul-de-sacs on Street 'B' and Street 'C', and at the end of future private Street 'D' aka Tract D.
d. All water services are to be located perpendicular from the main to each lot.
e. A utility easement, over and under the water main in Tract A and Tract B is to be shown on the engineering plans and the final plat.

39. The applicant should submit revised water utility plans that show in addition to the proposed fire hydrants at the end of the future cul-de-sacs, an additional fire hydrant is to be located near the intersection of future Street 'A' and future Street 'B'.

40. The applicant should submit revised water utility plans and landscape plans showing the locations of all proposed irrigation services and the size of each proposed irrigation meter.

[Storm Drainage]

41. The applicant shall submit a complete set of stormwater plans for review and approval, per MR #1 of the TIR.

42. The applicant shall submit a revised stormwater plan for Lots 1-38. Said plans should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.

43. The applicant shall submit a revised utility plan/stormwater plans that locate the stormwater detention facility, treatment manhole, treatment vault, storm control manhole, etc. in its own stormwater Tract.

[Erosion Control]

44. The applicant shall be required to submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

[Sanitary Sewer Disposal]

45. The applicant shall be required to submit the following:
    a. Calculations verifying that the sanitary sewer force main is adequately sized for solids and effluent to be pumped up to the highest point in the conventional gravity sewer main.
    b. An odor control system is to be installed at the sanitary sewer manhole that allows for the transition from conventional gravity to sanitary force main.
    c. All sanitary sewer laterals are to be laid perpendicularly from the mains to the lots.
    d. Calculations verifying that the pressure sewer laterals, from the grinder pumps to the force main, are adequately sized for solids and effluent.
    e. Grinder pumps and laterals are to be per the Camas Design Standards Manual (CDSM).
    f. The 2-inch sanitary sewer force main in Tract 'A', private street, is to be extended to the eastern property line of Parcel No. 173171000 to allow for future developments.

[Existing wells, septic tanks, and septic drain fields]

46. Any existing wells, or septic systems are to be decommissioned, and documentation shall be provided to the city that said wells and/or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

Roads:
[Public Roads]

47. The street improvement plans and the grading plans, along NE 28th Street, are to provide the following:
    a. Sufficient design information for the tapers to the east and west of the frontage improvements to allow for vehicular transitions between unimproved and improved frontages.
    b. The 6-foot public utility easement (PUE) is to be located outside of the 10-foot landscape buffer. Neither are to be located within the new right-of-way.
48. The street improvement plans are to be submitted with the additional 4-feet of right-of-way on NE 28th Street and the street sections in accordance with CDSM Street Detail ST5 3 Lane Collector / Arterial.
49. The applicant is required to construct a 37-foot-wide full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk.
50. The site improvement plans are to be submitted with the minimum 35-foot curb radii on both sides of the access road at the intersection of Street 'A' and NE 28th Street.

[Interior Public Roads]:

51. The future street names, public and private, are to be revised in accordance to the street names as determined by the Building Official.
52. A complete set of street improvement plans are to be submitted for review and approval.
53. The site improvement plans are to be submitted with the minimum 25-foot curb radii on both sides of the road at the intersections of Street 'A' and Street 'B'; Street 'B' and Street 'C'; Street 'B' and Tract 'A'; Street 'B' and Tract B; and Street 'B' and Tract D.

[Private Roads]:

<u>Private Road - Tract A</u>

54. The street plans and the preliminary plat are to be revised to provide for a dead-end turnaround at future Lot 7 on the west end of Tract A. The applicant is to work with the Fire Marshal's Office and engineering staff to provide an acceptable dead-end turnaround at the west end of Tract A.

<u>Private Road - Tract D</u>

55. The applicant is to submit site improvement plans with private road, Tract D, meeting Private Street Standard C with a 42-foot-wide tract, 28-foot paved surface, a 5-foot-wide sidewalk and planter strip on one side. On-street parking is permitted on one side only.
56. The applicant is to submit site improvement plans with the minimum 25-foot radii on both sides of the dead-end turnaround on private road, Tract D.

<u>Private Roads</u>

57. The applicant shall provide a design for a 'No Parking and Towing' sign for review and approval. Said sign is to include contact information for a private towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.
58. Garbage and recycling containers for those Lots who take access via the private streets on Tract A, Tract C, and Tract D; are to be placed at the public right-of-way for pickup.

[Street lighting]

59. All streetlight locations are to be shown on the street, utility, and landscape plans. Any streetlights provided for private streets are required to be metered separately and are to be owned and maintained by the HOA / homeowners.

60. Prior to submitting electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street trees and Landscaping]:

61. The applicant is to show proposed driveway locations for each lot to ensure that street trees are not impacted.

62. The applicant is required to submit to the City for review and approval a final landscape plan consistent with the landscaping standards in CMC Chapter 18.13, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list.

[Storm Facility Landscaping]:

63. The applicant is to submit revised stormwater facility plans that provide for a minimum 6-foot-high black vinyl coated chain link fence with top rail installed along the stormwater facility located in Tract F where the tract abuts the end of the private road on Tract D. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the paved access road to the facility and a minimum 4-foot-wide man gate for inspection access.

[Traffic Impact Analysis:]

64. The corner sight-distance triangles/site vision clearance triangles, at the intersection of the future Street 'A' and NE 28th Street, are to be shown on the final engineering plans and landscaping plans.

Prior to Land-Disturbing Activities:

65. Prior to any land-disturbing activities, the applicant should be required to submit a revised SWPPP with the contractor and CESCL information.

66. Prior to any land-disturbing activities, pa copy of Ecology's NPDES GCSWP permit, the SWPPP with contractor information, and the financial security for erosion and sediment control are to be submitted to the city.

67. Prior to any land-disturbing activities, which includes tree cutting, clearing and grading, and an approved set of final engineering plans, including erosion prevention and sediment control measures is required.

Prior to Final Plat Approval:

Engineering:

68. Prior to final plat approval, a plat note addressing the proportionate share amount per Lot, payable to the city for the North Shore Sewer Transmission System (aka NUGA-STS) is warranted.

69. The applicant shall submit a revised utility plan/stormwater plans that locate the stormwater detention facility, treatment manhole, treatment vault, storm control manhole, etc. in its own stormwater Tract.

70. The following notes are to be added to the final plat.

a. The Stormwater facilities located on Tract F is to be owned and maintained by the homeowner's association / homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.

b. Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tract F.

71. Prior to final plat approval, the final plat is to be revised with the 6-foot public utility easement (PUE) located outside of the 10-foot landscape buffer. Neither are to be located within the new right-of-way.

72. Prior to final plat approval, the frontage improvements are to include the additional 4-foot right-of-way dedication along NE 28th Street that results in the 37-foot right-of-way, 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk.

73. The preliminary plat is to be revised with the minimum 35-foot curb radii on both sides of the access road at the intersection of Street 'A' and NE 28th Street.

74. The preliminary plat is to be revised with the final street names as determined by the Building Official.

75. The preliminary plat is to be revised with the minimum 25-foot curb radii on both sides of the road at the intersections of Street 'A' and Street 'B'; Street 'B' and Street 'C'; Street 'B' and Tract 'A'; Street 'B' and Tract B; and Street 'B' and Tract D.

76. The applicant is to submit revised preliminary plat plans with the minimum 25-foot radii on both sides of the dead-end turnaround on private road, Tract D.

77. A note is to be added to the plat stating the Tract A, Tract B, Tract C, and Tract D; are to be owned and maintained by the property owners and/or homeowners association (HOA).

78. A note is to be added to the plat stating that 'on-street parking is prohibited on both sides of Tract A, B, and C.

Prior to Final Acceptance:

Engineering:

79. The applicant is required to provide a design for a 'No Parking and Towing' sign for review and approval.
    a. Said sign is to include contact information for a towing company, as the city does not provide towing on private roads, nor does the city enforce no parking on private roads.
    b. The applicant shall be required to install the 'No Parking and Towing' sings prior to final acceptance.

80. Prior to final acceptance all landscaping shall be installed or bonded for and all proposed street trees and landscaping are to be per CDSM Landscape Standards Plant Materials List.

81. The applicant is required to pay the proportionate share amount of $34,199.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount. Planning:

82. Prior to final acceptance, a conservation covenant should be recorded with the County to ensure the long-term preservation of the critical areas and any associated buffers, including maintenance of any mitigation actions, per CMC 16.51.240.

83. Prior to final acceptance, the applicant will be required to post a mitigation bond in an amount deemed acceptable by the city to ensure the oak mitigation is fully functional per CMC 16.51.250.

Prior to Final Occupancy:

Planning:

84. Street trees adjacent to lots should be installed prior to final occupancy per CMC 17.19.030.F.4.

Proposed Plat Notes

1. A homeowner's association (HOA) will be required for this development. Copies of the C.C. & Rs shall be submitted and on file with the City of Camas.
2. Building permits will not be issued by the Building Department until all subdivision improvements are completed and Final Acceptance has been issued by the City.
3. Maximum building lot coverage for this subdivision is 50% for single-story homes and 55% for two-story homes.
4. The lots in this subdivision are subject to traffic impact fees, school impact fees, fire impact fees and park/open space impact fees. Each new dwelling will be subject to the payment of appropriate impact fees at the time of building permit issuance.
5. Tree topping is not permitted within this development, nor removal of more than 20 percent of a tree's canopy. Trees that are determined to be hazardous by a licensed arborist may be removed after approval by the City. Required street trees shall be promptly replaced with an approved species.
6. In the event any item of archaeological interest is uncovered during a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
7. At the time of building permit issuance, each Lot is subject to a $1,235.77 fee per Lot, as the proportionate share contribution for the North Shore Sewer Transmission System, previously known and approved as the 'North Urban Growth Area – Sewer Transmission System' or NUGA-STS. If the NUGA SDC fees are updated to include the proportionate share fee amount of $1,235.77 per Lot, the proportionate share fee will no longer be required.
8. The Stormwater facilities located on Tract F are to be owned and maintained by the homeowner's association / homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.
9. Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tract F.
10. Tract A, Tract B, Tract C, Tract D, Tract E, and Tract F; are to be owned and maintained by the property owners and/or homeowners association (HOA).
11. Tract A, Tract B, and Tract C: On-street parking is prohibited on both sides of the street.
12. Stormwater facilities located on Tracts B, D, and F are to be owned and maintained by the homeowner's association / homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.
13. Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tracts B, D, and E.

14. The private road ‘Tract C’ consists of a utility easement for access, maintenance, replacement, repair, or extension, over and under the sanitary sewer force main is to be conveyed to the city.

PROJECT NARRATIVE
For

RESERVE AT GREEN MOUNTAIN

A PRELIMINARY TYPE III SUBDIVISION

Submitted to the
CITY OF CAMAS

FOR
Pacific Lifestyle Homes
11815 NE 99th Street Suite 1200
Vancouver, WA 98682

May 2025

Table of Contents

General Information 2
Project Description 3
Title 16 – Environment 4
16.01 - SEPA 4
16.31 – Archaeological Resource Preservation 4
16.51 – Critical Areas - 16.53 Wetlands – 16.55 Critical Aquifer Recharge Areas - 16.61 Fish and Wildlife Habitat 4
Title 17 – Land Development 5
17.01.050 – Survey Content 5
17.11 – Subdivisions 5
17.11.030.D. - Criteria for Preliminary Plat Approval. 5
17.19.030 – Tract, block and lot standards 7
17.19.040 – Infrastructure Standards 8
Title 18 - Zoning 12
18.07 – Use Authorization 12
18.09 – Density and Dimensions 12
18.11 – Parking 14
18.13 – Landscaping 14
18.15 – Signs 14
18.17 – Supplemental Development Standards 14
18.55 – Administration and Procedures 14
Shoreline Master Program 15

General Information

Applicant:	**Pacific Lifestyle Homes** 11815 NE 99th Street Suite 1200 Vancouver, WA 98682 (360) 597-7098 NickE@buildplh.com
Owner:	**Marwan A Bahu** PO Box 744 San Clemente, CA 92672
Contact:	**PLS Engineering** **Contact: Jayson Taylor** 604 W Evergreen Blvd Vancouver, WA 98660 (360) 944-6519 pm@plsengineering.com

Location:	**SW 1/4 Section 21, T2N, R3E, WM**
Site Address:	**2625 NE Goodwin Rd. Camas, WA**
Project Size:	**11.31 acres (492,832 sf)**
Jurisdiction:	**Camas**
Zoning:	**R-7.5**
Comprehensive Plan:	**SFM**
Current Use:	**Single family residence**
Tax Lot Information:	**173192000**
School District:	**Evergreen**
Elementary:	**Harmony**
Middle:	**Pacific**
High:	**Union**
Water District:	**Camas**
Sewer District:	**Camas**
Fire District:	**Camas**
Camas Project Reference:	**PA24-1029**

Project Description

The Reserve at Green Mountain proposes to subdivide 11.31 acres into 38 single-family detached residential lots in the R-7.5 zone utilizing density transfer standards. One single-family will remain onsite.

The site is primarily field grass with landscaping and scattered trees. The site is bordered by NE Goodwin Road/NE 28th Street to the north, single-family residences to the east and west, and Camp Currie to the south.

Transportation and Utilities:
Primary access to the site is provided from NE Goodwin Road/NE 28th Street. Frontage improvements along this street will include additional right-of-way and pavement to meet the requirements for a 3-Lane Arterial. No lots will have direct vehicular access to NE Goodwin Road/NE 28th Street.

The internal public streets will be constructed according to standard detail number ST3. These streets will generally provide a 28'wide paved road within a 52' right-of-way with 5' sidewalks and 5' planter strips on each side.

A traffic study has been provided that shows the projected trip generations for the development. No offsite mitigation is required based on the study.

The City of Camas is the water and sewer purveyor for the site. Existing water and sewer lines run through NE Goodwin Road/NE 28th Street to the north. The applicant expects to utilize a grinder pump system for sanitary sewer service.

All onsite stormwater runoff will be routed to a stormwater detention facility prior to being released into a wetland to the south of the site. Stormwater from pollution generating surfaces will be treated prior to entering the detention facility.

Critical Areas:
The site contains a wetland on the west/southwest portion of the site, a seasonal non-fish bearing stream on southeast portion of the site, an Urban Conservancy Shoreline area associated with Lacamas Creek (located approximately 0.25 miles southwest of the site), Oregon white oaks, an archaeological site buffer and moderate-high and high probability and is within a Category 2 Recharge Area per Clark County GIS maps. In addition, WDFW maps cave or cave-rich areas however no caves or rock outcroppings are present onsite.

Buffer reduction, averaging, and enhancement are proposed for impacts to wetland buffers. All onsite oak trees are proposed to be retained. There are no direct impacts to the onsite wetland and associated shoreline.

Proposal & Code Compliance Discussion

Title 16 – Environment

16.01 - SEPA

The State Environmental Policy Act (SEPA) procedures require documentation of critical areas as well as discussion on earth, air, water, plants and animals, energy and natural resources, environmental health, noise, land and shoreline uses, aesthetics, recreation, historic and cultural preservation, transportation, and public services and utilities. A SEPA application is required and has been included with this application.

16.31 – Archaeological Resource Preservation

The site is located in an area of moderate to high and high probability for the presence of archaeological artifacts. The site is also within an Archaeological Site Buffer per Clark County GIS data. Archaeological Services, LLC (ASCC) provided an Archaeological Predetermination Survey for this site. The report dated April 11, 2025 states that no artifacts were found. ASCC documented a historic era home onsite. Given the negative results of the predetermination, ASCC recommended that no further archaeological work is needed.

16.51 – Critical Areas - 16.53 Wetlands – 16.55 Critical Aquifer Recharge Areas - 16.61 Fish and Wildlife Habitat

Per Clark County GIS, the property is mapped as having wetlands on the southwest end. A Critical Areas Report has been prepared by Ash Eco Solutions (AES). AES identified two Category II wetlands, one partially located onsite along the west parcel boundary and the second located just offsite to the southeast. A High Land Use Intensity (LUI) such as a subdivision establishes a 260’ wetland buffer for each wetland.

The Critical Areas Report also addresses several Oregon white oaks onsite as well as a non-fish bearing un-named stream in the southeast corner of the parcel.

All Oregon white oaks will be retained onsite. The site has been designed to avoid the oak canopy therefore no impacts are proposed to the oak habitat. The project proposes reduction of the 260’ High LUI wetland buffer to the 195’ Moderate LUI buffer by establishing 100’ minimum corridor between Category II wetlands and the onsite Oregon white oak priority habitat, as allowed in CMC 16.53.050.C.1.a.i-ii. After modifying the standard buffer from 260’ to 195’ and applying the above outlined avoidance and minimization measures to the onsite critical areas, the project will have unavoidable impacts to two portions of the outer 195’ wetland buffer: Lots 21-25 and the stormwater facility are located within a portion of the modified 195’ wetland buffer. A Buffer Mitigation Plan is included in the Critical Areas Report that provides onsite mitigation for critical area impacts. The project has been designed to avoid direct impacts to the wetlands, Oregon white oak habitat, and the highest functioning mature forested buffer habitat present onsite. Mitigation measures will include “extensive wetland buffer enhancement and Oregon white oak habitat restoration - including habitat corridor

connectivity between these historically separated habitats. Therefore, the unavoidable impacts will be offset with adequate mitigation onsite for no net loss of habitat function or values."

Title 17 – Land Development

17.01.050 – Survey Content

17.01.050.B.2 addresses tracts shown on a preliminary plat. Six tracts are shown on the preliminary plat. All tracts will all be privately owned by the future Homeowners Association unless the city would like to take ownership of the stormwater facility. The following details the proposed tracts:

Tract:	Size	Use
A	3,559 sf	Private Driveway
B	2,213 sf	Private Driveway
C	1,392 sf	Private Driveway
D	5,056 sf	Private Driveway
E	1,434 sf	Landscape Area
F	184,716 sf	Open Space Park and Stormwater Facility (Includes all onsite critical areas)
G	3,379	Frontage Landscape Tract

17.11 – Subdivisions

This project is subject to a Type III process for land division. The application will be subject to the development approval and application timelines of this chapter.

The applicant has submitted the required documents and information as required by this section of code. A Submittal Requirements checklist was thoroughly reviewed with this application prior to submittal.

17.11.030.D. - Criteria for Preliminary Plat Approval.

The following addresses how the plat meets the criteria for approval:

1. *The proposed subdivision is in conformance with the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan, and any other city adopted plans;*

   By complying with the zoning and allowed uses as well as development code, this proposal will meet the goals and objectives of the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan and other city adopted plans.

2. *Provisions have been made for water, storm drainage, erosion control and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual;*

   All future lots will be served by public water and sanitary sewer. A storm drainage and erosion control plan, and utility plan are submitted with this application demonstrating how the plan meets current standards as adopted in the Camas Design Standards Manual. See section *17.19.040 – Infrastructure Standards* further below in this narrative, and the proposed plans, for further details.

3. *Provisions have been made for road, utilities, street lighting, street trees and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans;*

   The applicant is proposing frontage improvements to NE Goodwin Road/NE 28th Street and new public internal streets to serve the site. The improvements meet the Camas Design Standard Manual. Please refer to the proposed plans and section *17.19.040 – Infrastructure Standards* further below in this narrative.

4. *Provisions have been made for dedications, easements and reservations;*

   Right-of-way will be dedicated for the roadway improvements and the appropriate easements will be recorded for each of the onsite utilities that are located outside of the roadway.

5. *The design, shape and orientation of the proposed lots are appropriate to the proposed use;*

   The lots proposed meet code with the exception of lot width; the lot width is proposed to be reduced utilizing density transfer standards. See section *18.09 – Density and Dimensions* further below in this narrative.

6. *The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;*

   This narrative shows that the application complies with the applicable land development and zoning codes.

7. *Appropriate provisions are made to address all impacts identified by the transportation impact study;*

   A transportation impact study has been prepared for this project. This study indicates that all existing roadway infrastructure that will be used to serve the site will operate at acceptable levels of service at the time of full buildout. The applicant will be required to contribute $34,199 toward City of Vancouver projects for trip impacts to multiple intersections.

8. *Appropriate provisions for maintenance of commonly owned private facilities have been made;*

The proposed park areas and the stormwater facility are proposed to be owned and maintained by a homeowner's association.

9. *Appropriate provisions, in accordance with RCW 58.17.110, are made for:*

    a. *The public health, safety, and general welfare and for such open spaces, drainage ways, streets, or roads, alleys or other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds and all other relevant facts, including sidewalks and other planning features that assure safe conditions at schools bus shelter/stops, and for students who walk to and from school, and*

    Open space is provided with the project which is in addition to the ample open space located adjacent to the site. Drainage systems have been designed to meet city requirements. Public streets are proposed for the subdivision that will provide access to all proposed lots. All lots will be connected to public water and sewer services. A park area with benches and picnic tables is provided within the development.

    It is not likely that potential students would walk to schools from this site. Harmony Elementary is 2.9 miles from the site. Pacific Middle School is 2.9 miles from the site. Union High School is 1.6 miles from the site.

    b. *The public use and interest will be served by the platting of such subdivision and dedication;*

    The proposal provides much needed housing within an urban area that can be efficiently served with public facilities. The general public's interest will be served by this proposed development.

10. *The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.*

The narrative and plans demonstrate how the project complies with the applicable codes and environmental regulations. A Critical Areas Report & Mitigation Plan is included to address environmentally sensitive lands.

17.19.030 – Tract, block and lot standards

A. Generally, the proposed lots do not contain critical areas or buffers. There are a few Oregon White Oak trees that will be retained and protected along the property line.

B. Blocks have been provided in the only manner allowed on constrained site. A stub street is provided to the east from this development. Adjacent homes, critical areas and park land do not allow for road circulation to the west or south.

C. The use is compatible with existing uses therefore buffering is not required.

D. All lots front on a public street except for lots 5-7 and 15-16 that have access from private tracts. Lot lines generally run at right angles to streets. Lots 1-4 will comply with provisions for double frontage lots: a 10' landscaped buffer is proposed to screen the rear yard from public view; the home is not proposed to front on NE Goodwin Road/NE 28th Street. Building envelopes are shown on the Preliminary Plans.

E. There is a segment of the T-29 trail mapped at the southernmost end of the site. A paved sidewalk is stubbed to the south end of the site for pedestrians to connect to a future trail.

F. Landscaping will be provided on each lot and within common areas as required by code. Please see section *18.13 – Landscaping* below as well as the Preliminary Landscape Plan which has been submitted with this application for reference.

G. A 6' public utility easement is proposed along the street frontage of all lots for electric lines and other public utilities not owned by the city.

H. There is a Category II wetland located on the west portion of the site as well as an offsite wetland in the southeastern portion of the site. A non-fish bearing stream is located in the southeast corner of the parcel. The site contains Oregon white oak habitat. A Critical Areas Report and Buffer Mitigation Plan are included with this application.

I. Street signs will be installed by the developer.

J. Street lighting is proposed for the development along the public street as required.

17.19.040 – Infrastructure Standards

NE Goodwin Road/NE 28th Street is an existing 3-lane arterial that abuts the site to the north. Half-width improvements are proposed as part of this project. A 37' half-width right-of-way will be provided with a 23' half-width paved roadway, 6' detached sidewalks and a 6' planter strip. No lots will directly access NE Goodwin Road/NE 28th Street.

Streets A, B and C are proposed 2-lane public local access roadways that will serve the development. These streets will provide a 52 right-of-way, 28' paved width, 5' detached sidewalks with 7' planter strips. Streets B and C will terminate in a cul-de-sac. Streetlights will be installed per code requirements.

Street D is a proposed private road that will provide access to lots 21-26.

Table 17.19.040-2 Minimum Public Street Standards			
Roadway Type	**ROW Width**	**Pavement Width**	**Sidewalk**
A. Street	52’	28'	5' detached both sides of the street with planter strip. No parking on one side.
C. Street (three-lane)	74’	46	6’ detached sidewalks required on both sides of the street, with planter strip, bike lanes, no on-street parking

Private tracts/shared driveways are proposed to serve lots 5-7, 15-16, and 25-26.

Circulation:
The block perimeter exceeds perimeter length therefore the site does not meet circulation standards. There are wetlands to the south and streams to the west that prevent roads expanding in either direction. To the east, the intersection between Streets A and B allows for future developments to meet circulation standards. To the west of the site, parcel 172546000 can feasibly have take direct access from Goodwin Road in a future development scenario. The same can be true for parcel 173171000, but the proposal does allow for the extension of the private access in tract A to serve this lot in a short plat scenario.

The proposed cul-de-sac street, Street B, has a dead-end length of 800’. The site to the south is not within the urban growth boundary and is also owned by Clark County. No vehicular circulation is shown extended to the south due to the presence of wetlands and shoreline. A pedestrian connection will extend to the east and west for a future trail alignment. A pedestrian connection also connects to each cul-de-sac.

Tract B will provide access to parcel 173206000 to the east. The existing driveway to parcel 173206000 will be removed during the development of this site, future access will be via the new subdivision and Tract B.

Turnarounds:
The proposed Streets B and C terminate in cul-de-sacs that can be utilized as a fire turnaround. The dead-end length of Street B as measured from the face of curb on Street A to the end of the cul-de-sac is 800’. The cul-de-sac has a 44’radius as measured to the back of sidewalk and complies with standard detail ST-36. The dead-end length of Street C is 269’.

Intersection Design:
The intersection of Street A with NE Goodwin Road/NE 28th Street has been designed as far east as possible to achieve sight distance given the curve west of the site along NE Goodwin Road/NE 28th Street.

Pedestrian/Bicycle Circulation:
All sidewalks, driveway aprons, and road intersections will comply with the American with Disabilities Act.

Parking:
The average lot size is less than 7,400 sf, therefore additional parking is required per CMC 17.19.040.B.10.e. The proposal provides 8 additional parking spaces to meet this requirement. See Section *18.11 – Parking* below for further details.

Traffic Study:
A Traffic Study has been prepared for this project by Lancaster Mobley and is included with this application. The following is a summary of the study as found on page 4 of the report:

> "1. The proposed Reserve at Green Mountain project will include the construction of a residential subdivision on a single property addressed at 2625 NE Goodwin Road in Camas, Washington. The proposal will include the construction of 38 single-family detached houses, maintaining 1 existing house for a net increase of 37 homes. Access to the site will be provided via a proposed street connection along NE Goodwin Road.
>
> 2. The trip generation calculations show that the proposed subdivision is projected to generate an additional 26 AM peak hour trips, 35 PM peak hour trips, and 348 average weekday trips.
>
> 3. The proposed development is projected to impact nine of the transportation facilities where proportionate share fees are being collected by the City of Vancouver. The proposed development application will need to contribute a proportionate share fee of $34,199 toward these transportation improvement projects.
>
> 4. No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.
>
> 5. Adequate intersection and stopping sight distances are available at the proposed site access intersection to allow for safe and efficient operation along NE 28th Street. No sight distance related mitigation is necessary or recommended.
>
> 6. Left-turn lanes, traffic signals, and all-way stop-control warrants are not projected to be met at any of the applicable study intersections under any analysis scenario through the 2027 site buildout year. Accordingly, no new turn lanes or revisions to traffic controls are necessary or recommended as part of the proposed Reserve at Green Mountain project.
>
> 7. The proposed development will reconstruct its associated street frontage with NE 28th Street to include pedestrian and bicycle facilities in accordance with City of Camas street standards. Additionally, appropriate pedestrian and bicycle facilities will be constructed within site internal streets to accommodate student pickup/drop-off via school bus. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Reserve at Green Mountain subdivision,

and no further mitigation to pedestrian and bicycle facilities are necessary and recommended.

8. All study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application.

9. The northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. However, this excess queue can be accommodated by the northeast bound through lane without extending back to any other public intersection or driveway along NE Goodwin Road. Limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur due to this queuing. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development."

Sewer and Water

The site will be served by the City of Camas for public sewer service. There is an 8" gravity main located in the north half of NE Goodwin Road/NE 28th Street. This gravity sewer will be extended into the site and will directly serve the lots 1-7 in the development. Due to the existing grade that slopes significantly away from NE 28th Street, the remining lots will be served by a grinder pump system. The applicant will also allow an easement over tract F for any future sanitary sewer improvement that the City has planned in the future.

City of Camas will provide public water service. There in an existing 12" water main located in the south half of NE 28th Street. The development will extend a new 8" water main through the site from NE 28th Street to serve the new lots. Four new fire hydrants are proposed within the development and an existing hydrant will be moved to expand 28th St. A separate irrigation service will be provided for the public landscape areas.

Stormwater and Erosion Control

Stormwater runoff from pollution generating surfaces is proposed to be treated using filter cartridges and then routed to a detention pond**.**

A preliminary stormwater plan has been submitted with this application. The preliminary technical information report (TIR) has also been submitted with this application which better explains the stormwater system and how it meets the applicable code.

Title 18 - Zoning

18.07 – Use Authorization

The site is designated as being within the R-7.5 zoning district, a single-family residential district. The applicant proposes to subdivide the site into 38 lots for the intended use of single-family detached dwellings. This use is permitted outright in the R-7.5 zone.

18.09 – Density and Dimensions

Lots in the R-7.5 zone are required to meet the requirements of Table 1 of CMC 18.09.040. The applicant proposes to utilize density transfer standards and is requesting smaller lot sizes and setbacks due to the open space dedication provided.

Density Calculation:
Total site area = 11.31 acres
Critical Areas and Open Space = 3.94 acres
Net area = 7.37 acres

38 units/7.37 acres = 5.15 = 5.2 units per acre

Table 1 CMC 18.09.040– Density and Dimensions for Single-family Residential Zones			
	R-7.5	**Density Transfer**	**Proposed**
Maximum density (dwelling units/net acre)	5.8	5.8	5.42
Average lot area (square feet)	7,500	-	**5,816***
Minimum lot size (square feet)	6,000	5,250	**4,541***
Maximum lot size (square feet)	12,000	9,000	8,581
Minimum lot width (feet)	70	60	**45***
Minimum lot depth (feet)	90	80	100
Maximum building lot coverage	40%	40%	**50% & 55%***
Maximum building height (feet)	35	35	35

*Additional flexibility requested per CMC 18.09.060.D

Table 2 CMC 18.09.040 – Building Setbacks for Single-family Residential Zones	
Minimum front yard or front porch setback	**20'***
Minimum side yard	5'
Minimum side yard flanking a street and corner lot rear yard	10'
Minimum rear yard	**25'***
Minimum lot frontage on a cul-de-sac or curve	30'

*Additional flexibility requested per CMC 18.09.060.D

The proposal qualifies to be reviewed under the density transfer standards due to the fact that the proposal includes critical areas and recreational area tracts within the land division. The open space tract is 3.9 acres in size and includes recreational amenities including trails and picnic benches. The sites' critical area including wetland areas, buffers and a grove of trees are proposed to be retained within the open space tract.

The density transfer code section in the Camas Municipal Code 18.09.060.D states:

> *"Where a tract under "C" above, includes one-half acre or more of contiguous area, the city may provide additional or negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards under CMC Section 18.09.040 Table 1 and 2. In no case shall the maximum density of the overall site be exceeded. A letter explaining the request for negotiated flexibility shall be submitted to the director for consideration."*

The proposed open space tract exceeds ½ acre of contiguous area, therefore the site qualifies for flexibility in regards to lot standards. Per Camas Municipal Code 18.09.060 the applicant is requesting flexibility in the following code requirements:

- Reduced average lot size of 5,816 sf
- Reduced minimum lot size of 4,500 sf
- Reduced minimum lot width of 45'
- Reduced minimum front or front porch setback of 15'
- Reduced minimum garage setback of 20'
- Reduced minimum rear setback of 15'
- Increased lot coverage of 50% for single-story homes and 55% for two-story homes

The proposed requests are reasonable, and the minimum required to attain the allowed density on this site while still providing a mix of marketable homes. The reductions stated above are proposed to replace the standards of Camas Municipal Code 18.09.040. In return for flexibility to lot standards the applicant will provide trails and picnic tables within the recreational open space. This area can be owned and maintained by a homeowner's association or by the city if desired. Pedestrian paths are proposed to connect the two proposed cul-de-sacs as well as stub to the east and west to be extended with future development. Attractive landscaping will be provided in the park area, and it will support a range of recreational activities. See the proposed Landscape Plan for details.

With the proposed open space and the standards of integration of various lot sizes within the community, we believe that the proposed subdivision meets the intent of the zoning code and would result in an overall benefit for the public and the future residents of the community. This proposal achieves the desired density for the area which will help meet housing goals for the City. Increased housing helps to provide affordable housing which is an on-going issue in the greater Clark County area.

18.11 – Parking

Single-family residential dwellings are required to provide 2 parking spaces per unit. Each home will have a 2-car garage plus driveway space for parking, meeting and exceeding the minimum requirement.

Per CMC 17.19.040.B.10.e one additional off-street parking space is required for every five units when the average lot size is less than 7400 sf. With 38 proposed lots, 8 off-street parking spaces are required. 8 total off-street parking spaces are proposed. These spaces are located on tract F adjacent to lot 20 and near the main park area. These parking spaces meet the standard space dimensions and have a width of 9’ and a depth of at least 18’.

18.13 – Landscaping

A Landscape, Tree and Vegetation Plan has been submitted with this application showing proposed landscaping, and all onsite trees proposed to be retained or removed.

A 20-unit/acre tree density per net acre is required per CMC 18.13.051. The site is 11.3 acres therefore 226 tree units are required. A total of 754 tree units are provided with this development between new proposed plantings and existing trees to be retained The tree density is met by providing street trees, and plantings withing the proposed tract areas. The proposed and adjacent uses are residential or open space, so specific landscape buffers are not required.

18.15 – Signs

No signs are proposed with this project at this time.

18.17 – Supplemental Development Standards

This application will need to comply with the standards found in this section. Some standards that will apply include:

- 18.17.030 - Corner lot vision clearance area: a 15’x15’ vision clearance area is required on all corner lots.
- 18.17.040 - Accessory structures: No accessory structures are proposed with this application. If accessory structures are proposed by individual lot owners, they will need to comply with this section.
- 18.17.050 - Fences and walls: fences will be limited to 6’.

18.55 – Administration and Procedures

This project is subject to a Type III process for land division. The application will be subject to the development approval and application timelines of this chapter.

A preapplication meeting is required per CMC 18.55.060. A preapplication conference was held on December 23, 2024 and a land use application was submitted within 180 days.

The applicant has submitted the required documents and information as required CMC 18.55.110.

Shoreline Master Program

The pre-application conference report stated that a Shoreline Substantial Development Permit may be required. The shoreline jurisdiction extends to the onsite wetland area in the SW corner of the site. There are no direct impacts proposed to the wetland or the shoreline jurisdiction therefore a Shoreline Substantial Development Permit is not required.

PRE-APPLICATION MEETING NOTES
PA24-1029

Meeting held via Zoom: Thursday, December 5, at 3:30 p.m.
Notes issued via email on December 23, 2024

Applicant:	PLS Engineering
City of Camas:	Robert Maul, Planning Manger Madeline Sutherland, Planner Anita Ashton, Engineering Brian Smith, Building Official Randy Miller, Fire Marshal
Location:	2625 NE Goodwin Rd Parcel Number: 173192000
Zoning:	Single-Family Residential (R-7.5)
Description:	To construct a PRD with 49 lots.

NOTICE: Notwithstanding any representation by City staff at a pre-application conference, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite all relevant applicable code requirements to an applicant shall not constitute a waiver of any standard or requirement by the City. [CMC 18.55.060(C)]. This pre-application conference shall be valid for a period of 180 days from the date of the meeting. If an application is not filed within 180 days of the conference or meeting, the applicant must schedule and attend another conference before the city will accept a permit application. [CMC 18.55.060 (D)] Any changes to the code or other applicable laws, which take effect between the pre-application conference and submittal of an application shall be applicable. [CMC 18.55.060 (D)] A link to the Camas Municipal Code (CMC) can be found on the City of Camas website, http://www.cityofcamas.us/ on the main page under "Business and Development".

PLANNING DIVISION **Madeline Sutherland | (360) 817-1568 | msutherland@cityofcamas.us**

Applicable codes for development include Shoreline Master Program, Title 16 Environment, Title 17 Land Development, and Title 18 Zoning, of the Camas Municipal Code (CMC), which can be found on the city website. Please note it remains the **applicant's responsibility** to review the CMC and address all applicable provisions. The following pre-application notes are based on application materials and site plan submitted to the City on November 11, 2024.

Shoreline Substantial Development Permit

The southwest portion of the parcel falls within the Urban Conservancy Shoreline Designation, therefore a Shoreline Substantial Development Permit is required. The Urban Conservancy Designation requires residential uses to be setback 100 feet from the Ordinary High Water Mark, with a maximum height of 35 feet per SMP Table 6-1. Density must comply with the underlying zoning requirements. According to the SMP *"shorelands shall include those lands extending two hundred (200) feet in all directions as measured on a horizontal plane from the ordinary high water mark (OHWM), floodways and contiguous floodplain areas landward two hundred feet from such floodways, associated wetlands, critical areas with associated buffer areas, river deltas associated with the streams, and lakes and tidal waters that are subject to the provisions of this program."*

Planned Residential Development (PRD)
"The purpose of this chapter is to promote the public health, safety and general welfare of the citizens of the City of Camas in accordance with state law and the city's comprehensive plan; to facilitate the innovative development of land…" A PRD is a Type III process where City Council renders the final decision. The criteria in CMC 18.23.100 must be addressed and met. The application requirements are in CMC 18.23.070.

Preliminary Subdivision Plat
A preliminary plat is a Type III permit process where the final decision is rendered by the Hearings Examiner. Preliminary plat requirements are in CMC 17.11.030.

The following comments are based on the materials submitted for the pre-application meeting:

- Lots 1-9 are considered double frontage lots and must meet CMC 17.19.030.D.6.
- CMC 17.19.040.B10.e: *"When the proposed development's average lot size is seven thousand four hundred square feet or less, one additional off-street parking space shall be required for every five units, notwithstanding the requirements of CMC Chapter 18.11. These spaces are intended to be located within a common tract."*

Critical Areas
Critical Area and Mitigation Reports: There are critical areas on site (i.e. wetlands, habitat conservation areas), therefore a critical area report is required. Additional reporting requirements for each critical area type are in SMP 5.3. A mitigation plan is required if there are impacts to critical areas or buffers.

State Environmental Policy Act (SEPA)
Due to critical areas on site, a SEPA checklist is required to be submitted per CMC 16.07.010.

Archaeological Review
An archaeological predetermination report is required if there are any known artifacts within a quarter mile per SMP 5.2.

ENGINEERING DIVISION **ANITA ASHTON | (360) 817-7231 | aashton@cityofcamas.us**

General Requirements:

1. Final engineering site improvement plans shall be prepared in accordance with the Camas Design Standards Manual (CDSM) and CMC 17.19.040, by a licensed Civil Engineer in Washington State.
2. ***Final civil construction plans are not to be submitted until after Planning issues the land-use decision.***
3. ***After the land-use decision is issued, the applicant is to submit the final civil construction plans via the online portal at www.cityofcamas.us/Permits under the 'Civil Construction Application'.***
4. CDev Engineering Dept. is responsible for plan review (PR) and construction inspection (CI) of the civil site improvements.
5. A 3% PR&CI fee is collected by engineering for all infrastructure improvements.
    a. A stamped preliminary engineer's estimate shall be submitted to the CDEV Engineering Dept. with submittal of plans for first review.
    b. Payment of the 1% plan review (PR) fee shall be due prior to the start of the first review.
    c. Payment of the 2% construction inspection (CI) fee shall be due prior to construction plan approval and release of approved plans to the applicant's consultant.

   d. Under no circumstances will the applicant be allowed to begin construction prior to engineering plan approval.
6. *Per CMC 17.21.060.H Except for one sales office or one model home, building applications will not be accepted until after Final Acceptance has been issued for all infrastructure improvements.*
7. *Final acceptance is issued by the Community Development Engineering Dept.*
8. Existing wells and septic tanks and septic drain fields shall be decommissioned in accordance with State and County guidelines per CMC 17.19.020 (A3).
9. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, and traffic control markings for the proposed development.
10. Work within the city right-of-way (ROW) will require submittal an encroachment permit and approval of a traffic control plan (TCP), prior to the start of any work.
11. Regulations for installation of public improvements, improvement agreements, bonding, final platting, and final acceptance can be found at CMC 17.21.
12. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, interior street/parking lighting, and associated appurtenances are installed.

Traffic/Transportation:

1. A transportation impact analysis (TIA) is required when a proposed development results in 199 vehicle trips per day (VPD) or more.
2. As proposed, the development will generate 480 ADTs, therefore a TIA will be required.
3. The Applicant will be required to have a traffic engineer analyze the following:
   a. Site distance access at applicants proposed access intersections.
   b. Vision clearance areas are to be addressed, per CMC 18.17.030.
   c. Left-turn pocket.
   d. A traffic circulation plan showing on-site ingress and egress, per CMC 17.19.040 (B.10.a).
   e. Address movement conflicts with existing nearby intersections; and
   f. Provide trip AM and PM Peak distribution to and from the site.
3. The City of Vancouver requires trip distributions to the following intersections for payment of proportionate share contributions:

Proportionate Share Project Name	Fee Rate	Number of Trips	Proportionate Share Cost
137th Ave – from NE 49th St to Fourth Plain Blvd	$3,000 per PM peak hour trip		
Fourth Plain Blvd & NE 152nd Ave	$333 per PM peak hour trip		
Leiser / St. Helens / MacArthur	$2,000 per PM peak hour trip		
SE 176th Ave & SE 20th St	$400 per PM peak hour trip		
NE 192nd Ave & NE 13th St	$400 per PM peak hour trip		
SE 192nd Ave & SE 34th St	$150 per PM peak hour trip		
192nd Ave & SR-14 ramp terminals	$2,000 per PM peak hour trip		
MacArthur Blvd & Andresen Rd Roundabout	$2,285 per PM peak hour trip		
MacArthur Blvd & Devine Rd Roundabout	$2,226 per PM peak hour trip		
Grove St / Columbia House Blvd / SR-14 WB off-ramp	$600 per **AM** peak hour trip		
NE 172nd Ave & NE 18th St	$300 per PM peak hour trip		
NE 179th Place & NE 18th St	$900 per PM peak hour trip		
NE 187th Ave & NE 18th St	$1,200 per PM peak hour trip		
NE 162nd Ave & NE 9th St	$1,500 per PM peak hour trip		
NE 172nd Ave & NE 9th St	$4,100 per PM peak hour trip		
NE 192nd Ave & NE 9th St	$1,100 per PM peak hour trip		
NE 187th Ave & SE 1st St	$ 1,100 per PM peak hour trip		
Total Proportionate Share Cost			**$XXXX**

Streets:

1. The proposed development is located along the south side of NE Goodwin Road and NE 28th Street.
2. Both NE Goodwin Road and NE 28th Street are classified as an existing 3-lane arterial per the City's 2016 Transportation Comp Plan.
3. Per CMC 17.19.040.B.1, the applicant will be required to construct full depth half-width street improvements from the **existing centerline** on NE Goodwin Road and NE 28th Street along the frontage of the proposed development on NE Goodwin Road and NE 28th Street.
4. Per CMC 17.19.040.B.5, the applicant will be required to dedicate sufficient right-of-way from the existing centerline for full half-width, full-depth street improvements along the proposed frontage on NE Goodwin and NE 28th Street.
    a. The existing right-of-way (ROW) width along the frontage of the proposed development is 60-feet wide.
    b. Future ROW width is to be a minimum 74-feet-wide.
    c. The applicant will be required to dedicate sufficient ROW to provide for a minimum 37-foot-wide ROW width from the existing centerline of NE Goodwin Road and NE 28th Street.

   d. Current ROW width from centerline is 30-feet.
5. Per CMC 17.19.040.B Street, public roads shall meet the requirements as shown on Table 17.19.040-2 'Minimum Public Street Standards'.
   a. The applicant has proposed to construct 4 public Roads as follows:
      i. 52-foot-wide right-of-way, 28-foot paved surface, 5-foot-wide detached sidewalks, and planter strips on both sides.
   b. As proposed, the new public roads meet the street standards for Local Road Section B.
6. Per CMC 17.19.040.B.10.b.ii Cul-de-sacs and permanent dead-end streets over three hundred feet in length may be denied unless topographic or other physical constraints prohibit achieving this standard.
   a. When cul-de-sacs or dead-end streets are permitted, a direct pedestrian or bicycle connection shall be provided to the nearest available street or pedestrian oriented use.
   b. The proposed cul-de-sac is approximately 461-feet in length as measured from the center of proposed NE Goodwin Road and NE 28th Street.
      i. The applicant will be required to extend the construction of sidewalk from its current location, north of lot 49 to the entrance of the site front of NE 28th Street.
   c. Per the 2022 Comprehensive Plan, the applicant will be required to construct that portion of the future T-29 trail across the southernmost property line.
      i. The future T-29 trail is to be placed with a Tract.
7. Street tree planting is required is accordance with CMC 17.91030 (F).
8. LED street lighting is to be installed along all street frontages within and adjacent to the proposed development, in accordance with CDSM.
9. Prior to start of construction, the Contractor will be required submit the General Encroachment for Development Projects. This packet is not online nor is it to be submitted via the online portal. Staff will provide to the Contractor prior to the pre-construction meeting. The packet includes:
   a. General Encroachment Permit for Development & Capital Projects.
   b. Erosion Sediment Control/Construction Debris Cleanup forms.
   c. Indemnification & Hold Harmless Agreement.
   d. A Certificate of Insurance, per the city's Insurance Requirements.

Stormwater:

1. The site of the proposed development is approximately 11.67 acres in size.
2. The applicant shall submit a preliminary stormwater report (PTIR) in accordance with CMC 14.02 Stormwater Control and the most current edition of Ecology's *Stormwater Management Manual for Western Washington* ***(latest edition 2024 SWMMWW*)**.
3. The Department of Ecology (DOE) issued the latest edition of the *Stormwater Management Manual for Western Washington* on August 1, 2024.
4. Stormwater treatment and detention shall be designed in accordance with the latest edition of Ecology's ***Stormwater Management Manual for Western Washington (2024 SWMMWW).***
5. Refer to Ecology's *Figure I-3.2 Flow Chart for Determining Requirements for Re-Development (Vol. I, Chapter 3, Page 90)*.
   a. As the project will result in 5,000 sf, or greater, of new plus replaced hard surface area; then all Minimum Requirements will apply.
6. Per CMC 17.19.040.C.3.a Stormwater facilities are to be placed in a Tract, with right-of-entry to the City for inspection purposes.
7. Per CMC 14.02.090 ownership and maintenance of onsite stormwater facilities will be the responsibility of the Owner/HOA, per CMC 17.19.040 (C3).
8. Public and private storm easements, if required, are to be shown on the final engineering plans.

9. Provisions are to be provided for roof downspout controls. Stormwater from downspouts is not to be directed onto adjoining parcels. Reference CMC 14.02 and 17.19.040.C for roof downspout controls.

Erosion Control

1. The site of the proposed development is approximately 11.67 acres in size.
2. Per CMC 17.21.030.B an erosion and sediment control (ESC) bond, in the amount 200% of the engineer's estimate for ESC measures, is to be submitted prior to any land-disturbing activities.
3. As the land-disturbing activities are greater than one acre, the applicant will be required to obtain an *NPDES Construction Stormwater General Permit* from Ecology, which includes the *Stormwater Pollution Prevention Plan (SWPPP)*. Copies of both are to be submitted to Engineering prior to any land-disturbing activities.
4. The applicant will be responsible for all erosion and sediment control measures to ensure that sediment laden water does not leave the site or impact adjacent parcels.
5. Mud tracking onto the road surface is discouraged and any mud tracking is to be cleaned up immediately.

Water:

1. There is an existing 12-inch ductile iron water main located in the south half of NE Goodwin Road and NE 28th Street.
2. Per CMC 17.19.040.C.4 Each lot within a proposed development shall be served by a water distribution system designed and installed in accordance with city design standards.
3. The applicant will be required to design and construct a minimum 8-inch ductile iron water main from NE Goodwin Road and NE 28th Street to serve the proposed development.
    a. The 8-inch water main is to be extended to the eastern and westernmost property lines for both the proposed dead-ends.
4. The applicant shall provide a minimum 1-inch water service, and water meter box to each of the single-family residential lots located within this development.
5. Landscaping in open space tracts must have a separate irrigation service, backflow prevention device, meter box, and irrigation meter.
    a. The owner of the tract is responsible for payment for all fees associated with the installation of the meter and the water usage.
    b. Irrigation meters are to be owned by the HOA.
6. There is an existing fire hydrant on the south side of NE 28th Street, near the intersection of the proposed development.
    a. The applicant will be required to provide new fire hydrants located within the new development, per FMO.
7. Trenching, backfill, and surface restoration on NE Goodwin Road and NE 28th Street will be required, per CDSM Detail G2 and G2A.
8. Applicant shall demonstrate that there are adequate fire flows available for the development.
9. The tap on the existing water main is to be performed by a tapping Contractor approved by the City's Water/Sewer Dept. Approved list of Contractor's provided below.
10. A 10-foot separation shall be maintained between water and sanitary sewer lines.

Sanitary Sewer:

1. There is an existing 8-inch gravity main on the north side of NE Goodwin Road and NE 28th Street.
2. The applicant will be required analyze the existing 8-inch gravity main in NE Goodwin Road and NE 28th Street as well as the Goodwin Road Pump Station to ensure that both systems can handle the additional inflow from proposed development.

3. Per CMC 17.19.040.C.2 The applicant will be required design and construct a sanitary sewer system to serve the proposed development.
    a. The applicant shall provide a separate sanitary lateral for each single-family residential lot located within the development.
4. The applicant is required to extend the sewer mains to the western and easternmost dead-ends and to provide a sanitary sewer easement over the proposed paths that run north-to-south and west-to-east for a future sanitary sewer main.
5. Due to the site sloping away from NE Goodwin Road and NE 28th Street, the proposed lots will require individual grinder pumps for each SFR that will be owned and maintained by the individual homeowners.
6. Trenching and surface restoration on NE Goodwin Road and NE 28th Street is to be per CDSM Details G2 and G2A.
7. A 10-foot separation is required, within the right-of-way and the private road serving the development, between the water service and sewer lateral.

City Approved Tapping Contractors:

1. A&A Drilling Services, Inc (water & pressure sewer):
   16734 SE Kens Ct. #B, Milwaukie, OR 97267, 800-548-3827,
   http://www.aadrilling.com
2. Ferguson Waterworks (water only):
   14103 NW 3rd Court, Vancouver, WA 98685, 360-896-8708,
   https://www.ferguson.com/branch/nw-3rd-ct-vancouver-wa-waterworks

Garbage and Recycling:

1. Garbage and recycling receptacles are to be placed at the city right-of-way for pickup.

Parks/Trails:

1. Per the 2022 Parks, Recreation, and Open Space (PROS) Comprehensive plan, there is a segment of the T-29 trail, shown to traverse west-to-east, at the southernmost limits of the proposed development.
    a. Applicant will be required to provide an easement that can encompass both the pedestrian access trail and the sewer easement.
2. The property to the south and east of the proposed development is owned by Clark County Parks.

Impact Fees & System Development Charges (SDCs):

1. This development is in the North District.
2. Impact fees and SDCs are collected at time of building permit issuance.
3. The impact fees and SDCs noted below are for informational purposes only.
4. **Impact fees and SDCs are adjusted on January 1st of each year.**

Impact Fees for 2025 (North District):

Single Family:

1. Traffic Impact Fees (TIF) - $10,633.00
2. School Impact Fees (SIF) – $6,432.62
3. Park/Open Space (PIF) – Residential Scaled by Square Footage
    a. 0 to 1,000 sf - $4,259.00
    b. 1,001 to 2,000 sf - $7,802.00
    c. 2,001 to 2,600 sf - $11,841.00
    d. 2,601 sf and above - $13,549.00
4. Fire (FIF) - $0.71 psf

System Development Charges (SDCs) – 2025 Charges:

1. Water –
    a. 3/4" meter - $9,337.00 + connection fee
    b. 1" meter - $15,560.00 + connection fee
2. Sewer – Residential
    a. Residential - $7,407.00

FIRE DIVISION **RANDY MILLER | (360) 834-6191 |** fmo@cityofcamas.us

1) Any existing structures scheduled for demolition may be considered for use as a fire department training burn. Contact DFM Randy Miller at the FMO for further information. 360-834-6191
2) NFPA 13D Residential Fire Sprinklers required in all new dwellings. Additionally, it is recommended to install fire sprinklers in all garages in consultation with your fire sprinkler contractor. Contact the FMO for further information. This may be a requirement option to mitigate noncompliance issues.
3) If a larger water meter is required to meet fire flow and the larger meter is not required for reasons of the international residential code from the building department, the SDC up-charges are waived and the minimal cost difference in the actual meter shall be paid.
4) A flow switch is optional but recommended to tie into the homes security system along with an outside bell.
5) If a PRV is needed for pressures over 80 PSI on the domestic supply, it shall be installed after the fire line supply. If the pressure is over 80 PSI a PRV may be needed on the toilet supply line supplied from the fire sprinkler system.
6) An inside bell or horn strobe is recommended (If system is not tied into a security system) Contact Randy Miller in the FMO for more information.
7) Water supply line from the meter into the structure shall be sized per the fire sprinkler contractors design calculations or a 2- inch line shall be installed.
8) Providing fire sprinklers in garages are optional but strongly encouraged. Please contact the FMO for further details.
9) At a minimum provide the installation of a fire hydrant at the entrance to the subdivision off of 28th St, a Fire Hydrant on the corner of lot 14, additional fire hydrants may be required and will be evaluated on construction submittals.
10) Witnessed hydrant flushing is required with the FMO on all new fire hydrant installations.
11) Access roads or flag lots to be a minimum 12-foot wide paved with a 20-foot wide clearance and a minimum 13.6-foot vertical clearance. These minimums may be greater per city of Camas engineering department, the stricter road standard applies.
12) Approved Fire Department turnaround required for dead end streets or access driveway over 150 ft. Measured from the center line of from the main road accessing the short plat.
13) Provide approved radiuses to access roads/driveways etc. that do not require fire engines to turn into oncoming traffic to accomplish the turn and to avoid rear tires of emergency vehicles from making contact with curbs/sidewalks.
14) Obstructed access plan required for all private roads, driveways, flag lots serving more than one home or access tracts. Towing signs are the recommended plan unless an alternate method is provided and approved.
15) Any discovered underground oil or fuel storage tank requires a decommissioning permit through the FMO.
16) A propane Permit is required with the Fire Marshals Office for any tanks over 124 gallons.
17) Approved address monument required on any flag lot where the access road leaves the main public or private road. Address monument and numbers shall be clearly visible and readable from all

directions. Contact the FMO for approval. Further discussion shall be required for one access serving two different street names/numbers and whether there is a way for this to be accomplished.

18) Permanent addresses on homes to be mounted so that a garage sconce or other light illuminates the numbers.
19) Temporary Addresses required at all times for each structure/lot until permanent address numbers are installed, please give attention to making the numbers extremely visible from the street and unlikely to be blocked by parked vehicles so emergency services can easily see and read.
20) Please do not hesitate to contact the FMO if you have any questions. 360-834-6191 or FMO@cityofcamas.us

lancaster mobley

Reserve at Green Mountain

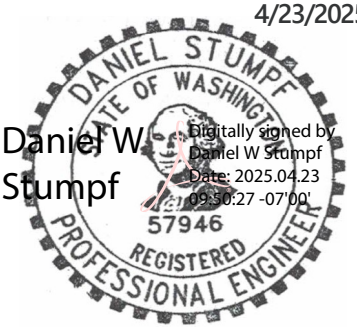
Transportation Impact Study
Camas, Washington

Date:
April 23, 2025

Prepared for:
Nick Edwards
Pacific Lifestyle Homes

Prepared by:
Daniel Stumpf, PE

4/23/2025



Daniel W Stumpf

Digitally signed by Daniel W Stumpf
Date: 2025.04.23 09:50:27 -07'00'

Table of Contents

Executive Summary 3

Project Description 4
- Introduction 4
- Location Description 4

Site Trips 8
- Trip Generation 8
- Trip Distribution 9
- Proportionate Share Contributions 9

Traffic Volumes 12
- Existing Conditions 12
- Background Conditions 12
- Buildout Conditions 13

Safety Analysis 17
- Crash History Review 17
- Sight Distance Evaluation 18
- Warrant Analysis 19
- Pedestrian and Bicycle Safety 21
- Access Spacing 22

Operational Analysis 23
- Intersection Capacity Analysis 23
- Intersection Queuing Analysis 25

Conclusions 27

List of Appendices

Appendix A – Site Plan
Appendix B – Trip Generation and Distribution
Appendix C – Traffic Volumes
Appendix D – Safety Analysis
Appendix E – Operation Analysis

List of Figures

Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth) 5
Figure 2: Vicinity Map 7
Figure 3: Trip Distribution and Assignment 11
Figure 4: Year 2025 Existing Conditions 14
Figure 5: Year 2027 Background Conditions 15
Figure 6: Year 2027 Buildout Conditions 16

List of Tables

Table 1: Vicinity Roadway Descriptions 5
Table 2: Study Intersection Descriptions 6
Table 3: Site Trip Generation Summary 8
Table 4: Existing On and Off-Site Trip Generation 9
Table 5: Proportionate Share Contributions 10
Table 6: Crash Type Summary 17
Table 7: Crash Severity and Rate Summary 18
Table 8: Capacity Analysis Summary 24
Table 9: Queuing Analysis Summary 25

Executive Summary

1. The proposed Reserve at Green Mountain project will include the construction of a residential subdivision on a single property addressed at 2625 NE Goodwin Road in Camas, Washington. The proposal will include the construction of 38 single-family detached houses, maintaining 1 existing house for a net increase of 37 homes. Access to the site will be provided via a proposed street connection along NE Goodwin Road.
2. The trip generation calculations show that the proposed subdivision is projected to generate an additional 26 AM peak hour trips, 35 PM peak hour trips, and 348 average weekday trips.
3. The proposed development is projected to impact nine of the transportation facilities where proportionate share fees are being collected by the City of Vancouver. The proposed development application will need to contribute a proportionate share fee of $34,199 toward these transportation improvement projects.
4. No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.
5. Adequate intersection and stopping sight distances are available at the proposed site access intersection to allow for safe and efficient operation along NE 28th Street. No sight distance related mitigation is necessary or recommended.
6. Left-turn lane, traffic signal, and all-way stop-control warrants are not projected to be met at any of the applicable study intersections under any analysis scenario through the 2027 site buildout year. Accordingly, no new turn lanes or revisions to traffic controls are necessary or recommended as part of the proposed Reserve at Green Mountain project.
7. The proposed development will reconstruct its associated street frontage with NE 28th Street to include pedestrian and bicycle facilities in accordance with City of Camas street standards. Additionally, appropriate pedestrian and bicycle facilities will be constructed within site internal streets to accommodate student pickup/drop-off via school bus. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Reserve at Green Mountain subdivision, and no further mitigation to pedestrian and bicycle facilities are necessary and recommended.
8. All study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application.
9. The northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. However, this excess queue can be accommodated by the northeast bound through lane without extending back to any other public intersection or driveway along NE Goodwin Road. Limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur due to this queuing. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development.

Project Description

Introduction

The proposed Reserve at Green Mountain project will include the construction of a residential subdivision on a single property addressed at 2625 NE Goodwin Road in Camas, Washington. The proposal will include the construction of 38 single-family detached houses, maintaining 1 existing house for a net increase of 37 homes. Access to the site will be provided via a proposed street connection along NE 28th Street.

Based on correspondence with City of Camas staff, the report conducts safety and capacity/level of service analyses at the following intersections:

1. NE Ingle Road at NE Goodwin Road (City of Camas)
2. Site Access at NE 28th Street (City of Camas)
3. NE 232nd Avenue at NE 28th Street (Clark County)
4. NE 242nd Avenue (SR-500) at NE 28th Street (WSDOT)

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses, and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The project site is located south of NE 28th Street, east of NE Ingle Road, and west of NE 232nd Avenue in Camas, Washington. The site consists of a single property (assessor parcel 173192000), which encompasses an approximate total of 11.67 acres. Located within a developing area of the City of Camas, the site is immediately surrounded by low-density residential uses to the east and west, and undeveloped/forested land to the north and south.

Figure 1 presents an aerial image of the nearby vicinity with the project site outlined in yellow.



Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)

Vicinity Streets

The study area is composed of five roadways near the site. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Street Name	Jurisdiction	Functional Classification	Speed (MPH)	On-Street Parking	Curbs & Sidewalks	Bicycle Lanes
NE Ingle Road	Camas	Collector	40	Not Permitted	Partial East Side	Partial Both Sides
NE Goodwin Road	Camas	Arterial	35/40	Not Permitted	Partial South Side	Partial Both Sides
NE 28th Street	Camas/Clark County	Arterial	40	Not Permitted	Partial North Side	Partial North Side
NE 232nd Avenue	Clark County	Arterial	45	Not Permitted	None	None
SR-500	WSDOT	Regionally Significant Highway	45	Not Permitted	None	None

Table Notes: Functional classification based on City of Camas Functional Classification Map

Study Intersections

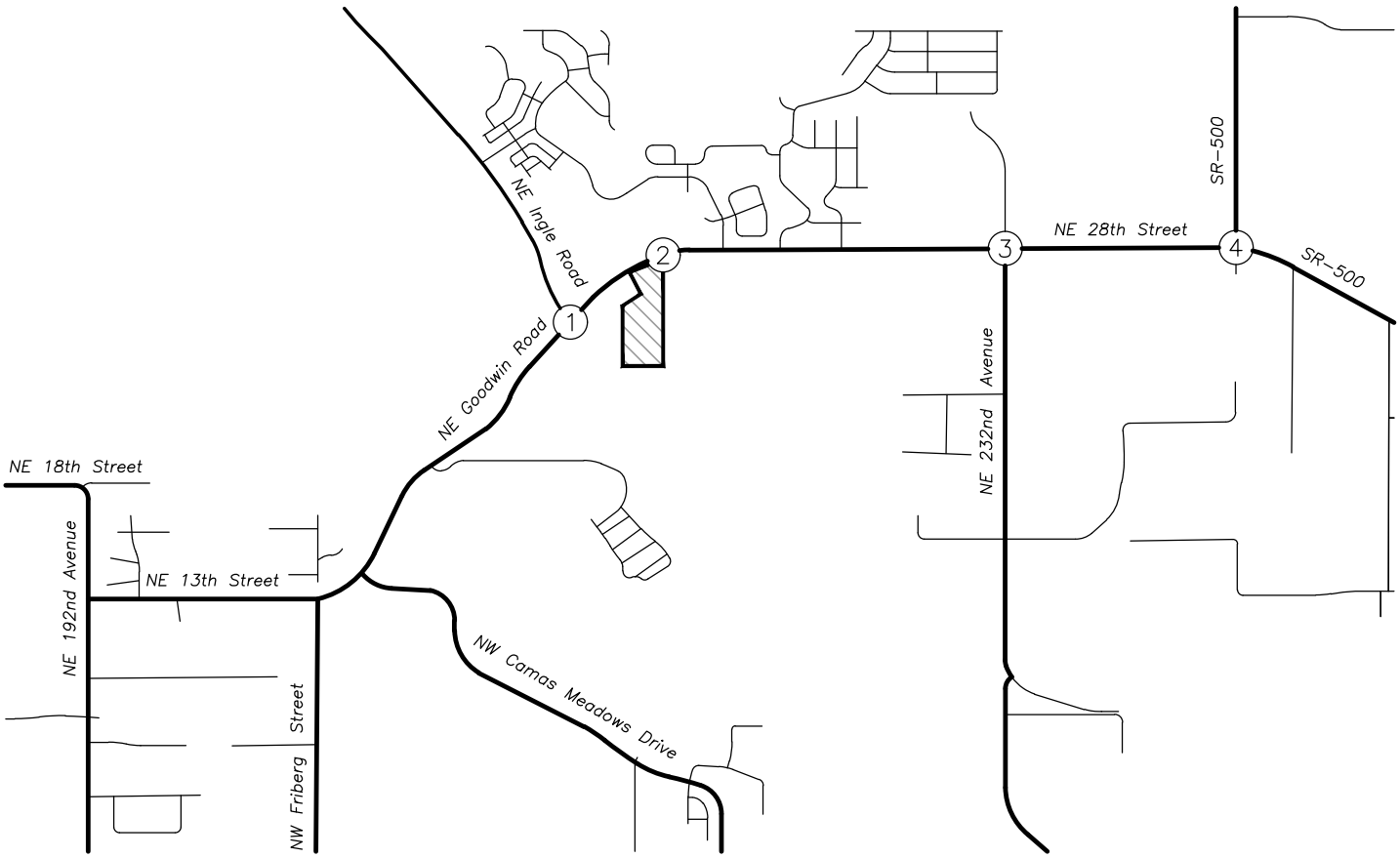
An analysis of four existing nearby intersections of significance was conducted. A summarized description of these study intersections under their existing lane configurations is provided in Table 2.

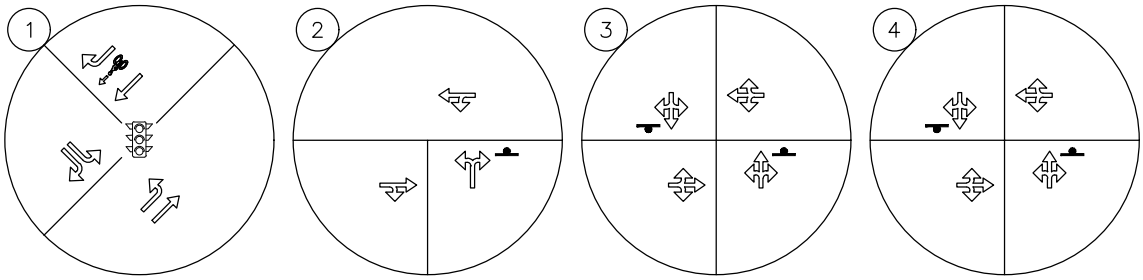
Table 2: Study Intersection Descriptions

Number	Intersection	Geometry	Traffic Control	Phasing/Stopped Approaches
1	NE Ingle Road at NE Goodwin Road	Three-Legged	Signal	FYA NEB Left-turn Lane
2	Site Access at NE 28th Street	Three-Legged	Stop-Controlled	NB Stop-Controlled Approach
3	NE 232nd Avenue at NE 28th Street	Four-Legged	Stop-Controlled	NB/SB Stop-Controlled Approaches
4	SR-500 at NE 28th Street	Four-Legged	Stop-Controlled	NB/SB Stop-Controlled Approaches

Table Notes: Flashing-Yellow-Arrow denoted as FYA.

A vicinity map showing the project site, vicinity streets, and study intersection configurations are shown in Figure 2.





no scale

lancaster mobley

VICINITY MAP

Figure 2

Reserve at Green Mount

4/23/2025

Site Trips

Trip Generation

Site Trip Generation

The proposed Reserve at Green Mountain subdivision will include the construction of 38 single-family detached houses, maintaining 1 existing house for a net increase of 37 homes. To estimate the number of trips that are and will be generated by the existing and proposed uses, trip rates from the *Trip Generation Manual, 11th Edition*.[1] were used. Data from the land use code 210, *Single-Family Detached Housing*, was used to estimate site trip generation based on the number of dwelling units.

The trip generation calculations show that the proposed subdivision is projected to generate an additional 26 AM peak hour trips, 35 PM peak hour trips, and 348 average weekday trips. The trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included in the technical appendix.

Table 3: Site Trip Generation Summary

ITE Land Use Code		Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Existing Conditions									
210	Single-Family Detached Housing	1 unit	0	1	1	1	0	1	10
Proposed Conditions									
210	Single-Family Detached Housing	38 units	7	20	27	23	13	36	358
Net Change In Site Trip Generation									
Net New Trips		**37 units**	**7**	**19**	**26**	**22**	**13**	**35**	**348**

Assessor Parcels 173206000 and 173173000 – Trip Generation

The proposed site access at NE 28th Street will be located along east side of the project site. The proposed access will replace an existing shared driveway which serves assessor parcels 173206000 and 173173000. Both parcels are developed with single-family detached houses, where two of these houses utilize the shared driveway. To estimate existing site trip generation at the access intersection, data from land use code 210 was referenced. For the purposes of simplicity and to provide an overly conservative evaluation of existing traffic operation at the driveway intersection, trips generated by the existing on-site single family house, as described in Table 3, were consolidated with the trips generated by the two off-site single-family houses.

The trip generation estimates associated with the three existing on-site and off-site houses are summarized in Table 4. Detailed trip generation calculations are included in the technical appendix.

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

Table 4: Existing On and Off-Site Trip Generation

ITE Land Use Code		Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Existing Site Trip Generation									
210	Single-Family Detached Housing	1 unit	0	1	1	1	0	1	10
Existing Off-Site Trip Generation									
210	Single-Family Detached Housing	2 units	0	1	1	1	1	2	18
Total Existing Trips Generated									
Total Trips		**3 units**	**0**	**2**	**2**	**2**	**1**	**3**	**28**

Trip Distribution

The trip distribution of the project site was derived using the Southwest Washington Regional Transportation Council (RTC) transportation system model. The project site is located in Transportation Analysis Zone (TAZ) #1829, for which a select zone analysis was run to determine the distribution of site trips entering and exiting the zone.

The following trip distribution is projected:

- Approximately 48% of site trips will travel to/from the southwest along NE Goodwin Road, southwest of NE Ingle Road.
- Approximately 21% of site trips will travel to/from the north along NE Ingle Road, north of NE Goodwin Road.
- Approximately 15% of site trips will travel to/from the south along NE 232nd Avenue, south of NE 28th Street.
- Approximately 9% of site trips will travel to/from the north along SR-500, north of NE 28th Street.
- Approximately 7% of site trips will travel to/from the east along SR-500, east of NE 28th Street.

The trip distribution and assignment for the site trips generated during the AM and PM peak hours are shown in Figure 3.

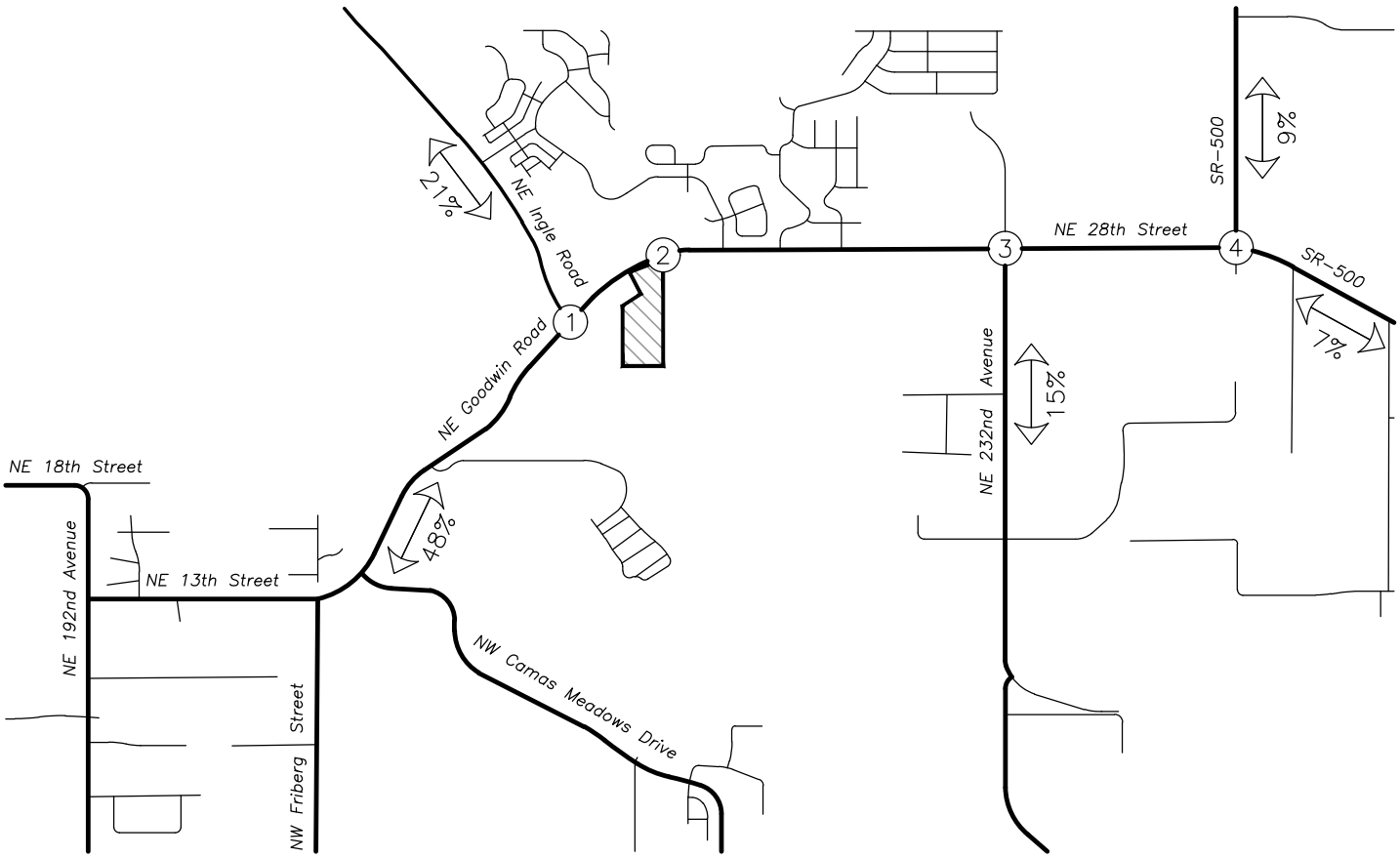
Proportionate Share Contributions

According to the project's Pre-Application Conference Report, proportionate share contributions are being collected for several transportation facilities throughout the City of Vancouver. Table 5 details these transportation improvement projects and the proportionate share fee contributions attributable to the proposed development.

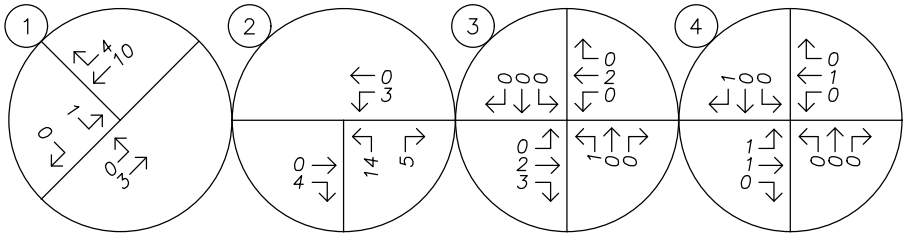
Table 5: Proportionate Share Contributions

Project Location	Unit Cost Per Trip		Percent of Site Trips Generated	Peak Hour Trip Impact		Proportionate Share Contribution
NE 137th Avenue (NE 49th Street to NE Fourth Plain Boulevard)	$3,000	PM	0.00%	0	PM	$0
NE Fourth Plain Boulevard at NE 152nd Avenue (Signal)	$333	PM	9.09%	3	PM	$999
S Lieser Road at MacArthur Boulevard/St Helens Avenue	$2,000	PM	0.00%	0	PM	$0
SE 176th Avenue at SE 20th Street	$400	PM	1.14%	0	PM	$0
NE 192nd Avenue at NE 13th Street	$400	PM	43.18%	15	PM	$6,000
SE 192nd Avenue at SE 34th Street	$150	PM	11.36%	4	PM	$600
SE 192nd Avenue at SR-14 Ramps	$2,000	PM	6.82%	2	PM	$4,000
SE 192nd Avenue at SE Columbia Palisades Drive (east/west legs only)	$830	PM	0.00%	0	PM	$0
MacArthur Boulevard at Andresen Road (Roundabout)	$2,285	PM	0.00%	0	PM	$0
MacArthur Boulevard at N Devine Road (Roundabout)	$2,226	PM	0.00%	0	PM	$0
Grove Street/SR-14 Off-Ramp at Columbia House Boulevard	$600	AM	0.00%	0	AM	$0
NE 172nd Avenue at NE 18th Street	$300	PM	9.09%	3	PM	$900
NE 179th Place at NE 18th Street	$900	PM	11.36%	4	PM	$3,600
NE 187th Avenue at NE 18th Street	$1,200	PM	13.64%	5	PM	$6,000
NE 162nd Avenue at NE 9th Street	$1,500	PM	0.00%	0	PM	$0
NE 172nd Avenue at NE 9th Street	$4,100	PM	0.00%	0	PM	$0
NE 192nd Avenue at NE 9th Street	$1,100	PM	28.41%	10	PM	$11,000
NE 187th Avenue at SE 1st Street	$1,100	PM	3.41%	1	PM	$1,100
Total Proportionate Share Contribution						**$34,199**

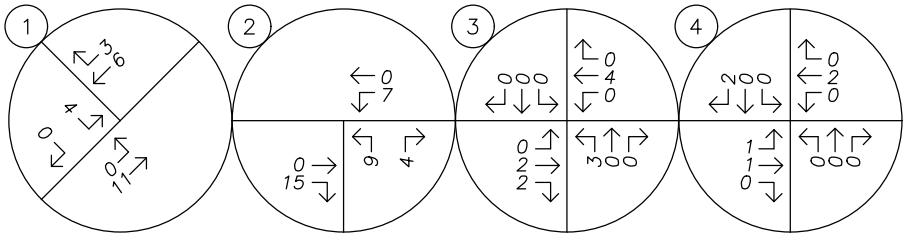
Per the RTC distribution modeling data and based on the calculated site trip generation, the proposed development is projected to impact nine of the transportation facilities where proportionate share fees are being collected. The proposed development application will need to contribute a proportionate share fee of $34,199 toward these transportation improvement projects.



AM PEAK HOUR



PM PEAK HOUR



LEGEND

XX% *PERCENT OF PROJECT TRIPS*

NET NEW TRIP GENERATION			
	IN	OUT	TOTAL
AM	7	19	26
PM	22	13	35

no scale

lancaster mobley

SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM & PM Peak Hours

Figure 3

Traffic Volumes

Existing Conditions

Traffic counts were conducted at the study intersections on Wednesday, March 12, 2025, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. Data was used from each intersection's respective AM and PM peak hours.

To estimate the existing year traffic volumes at the site access intersection, the following were conducted and assumed:

- Minor-street traffic volumes from the one existing on-site single-family detached house and two off-site houses, which currently utilize the driveway, were referenced from Table 4 and assigned to the intersection turning movements in a manner consistent with the methodologies detailed in the *Trip Distribution* section.
- Major-street volumes were balanced with those recorded at the intersection of NE Ingle Road at NE Goodwin Road.

Figure 4 shows the year 2025 existing traffic volumes at the study intersections during the AM and PM peak hours.

Background Conditions

Volume Growth

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. In order to approximate the future year 2027 traffic volumes at the study intersections, a compounding growth rate of two percent per year for an assumed buildout condition of two years was applied to the year 2025 existing traffic volumes.

In-Process Data

In addition to the traffic volume growth described above, there are several in-process developments that are currently approved/proposed for construction within the site vicinity that are expected to impact nearby study intersections. These in-process developments include the following:

- CJ Dens East Subdivision (Approximately 40% Built)
- Green Mountain Estates Phases 1-7 (Approximately 70% Built)
- Monte Verde Subdivision (Approximately 0% Built)
- 18th Avenue Subdivision (Approximately 0% Built)
- Fresenius Kidney Care Medical Office (aka Archery Pad 5, Approximately 0% Built)
- Camas Heights Subdivision (Approximately 0% Built)
- Camas Meadows Subdivision (Approximately 0% Built)
- Camas Woods Subdivision (Approximately 0% Built)
- Valley View Estates (Approximately 40% Built)

- Green Mountain Master Plan (Approximately 75% Built)
- Hood Street Subdivision (Approximately 0% Built)
- McIntosh Subdivision (Approximately 0% Built)
- Village at Camas Meadows (Approximately 50% Built)

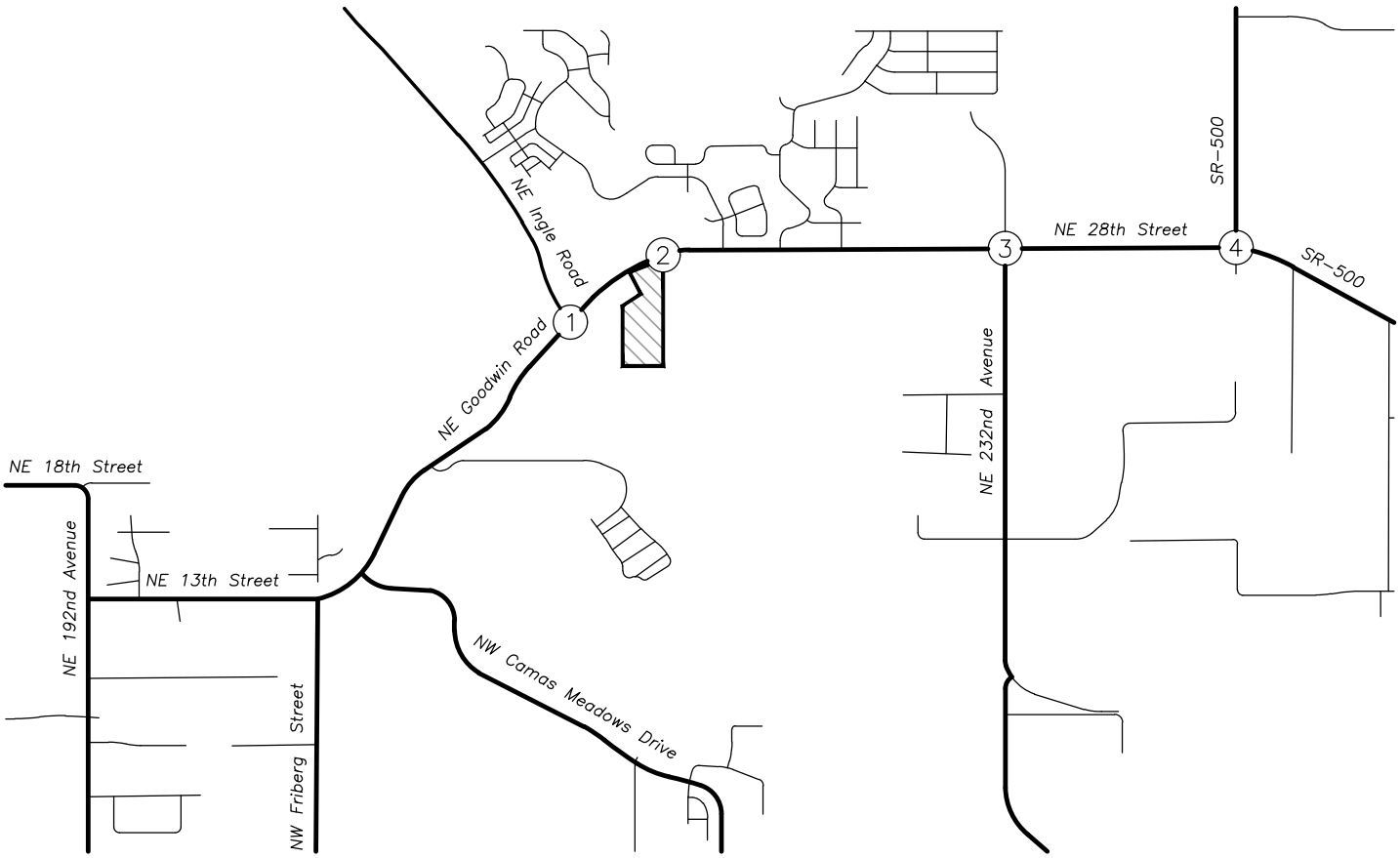
The in-process developments are not currently/fully contributing trips to the transportation system but may potentially be by the assumed 2027 buildout year of the site. Additional trips corresponding to each in-process development were added to the existing year traffic volumes in addition to the two years of traffic growth at each of the applicable study intersections. To maintain a conservative analysis of operation at the study intersections, all in-process developments were assumed to be constructed by year 2027. Figure A in the technical appendix shows the in-process development trips at the study intersections during the AM and PM peak hours.

Figure 5 shows the projected year 2027 background traffic volumes at the study intersections during the AM and PM peak hours.

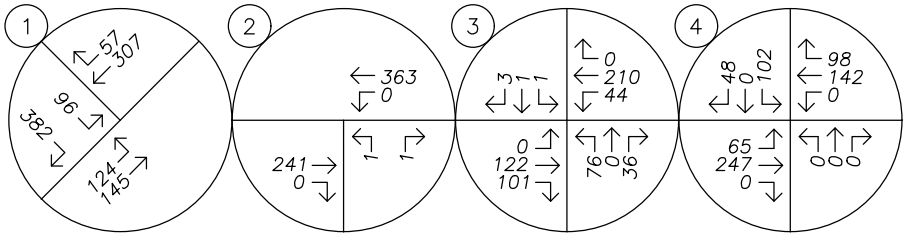
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2027 background traffic volumes to obtain the expected 2027 site buildout volumes.

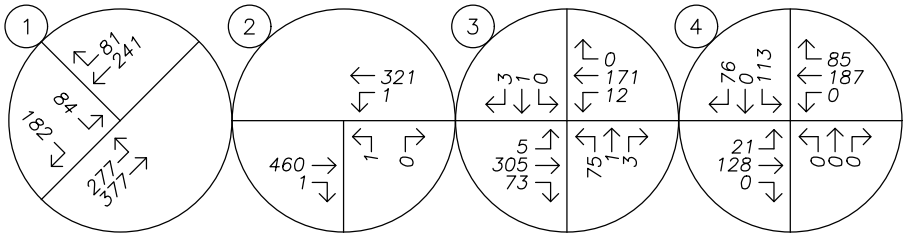
Figure 6 show the year 2027 buildout traffic volumes at the study intersections during the AM and PM peak hours.



AM PEAK HOUR



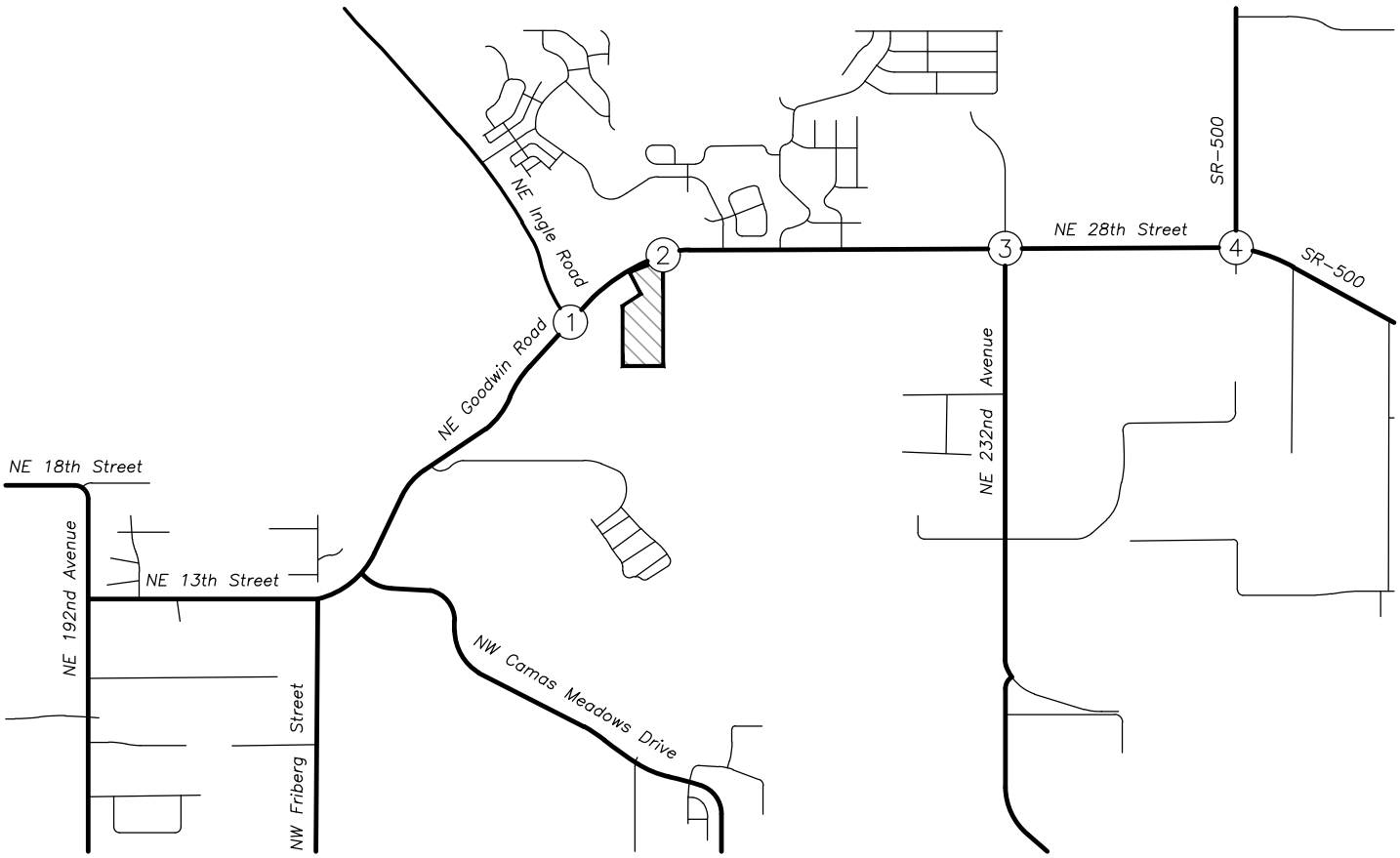
PM PEAK HOUR



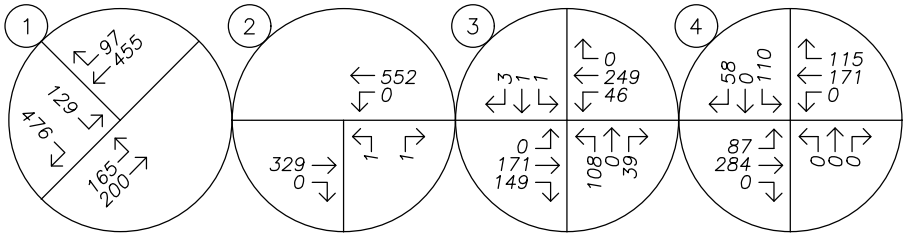
no scale

TRAFFIC VOLUMES
Year 2025 Existing Conditions
AM & PM Peak Hours

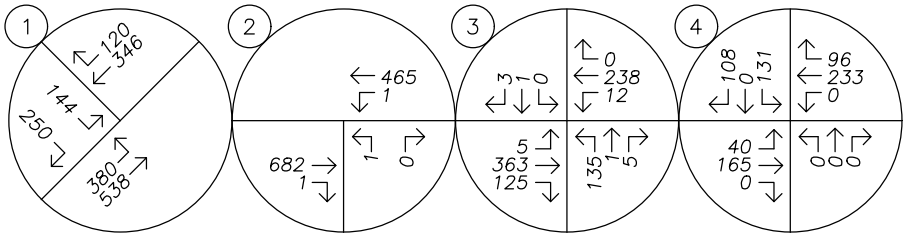
Figure 4



AM PEAK HOUR



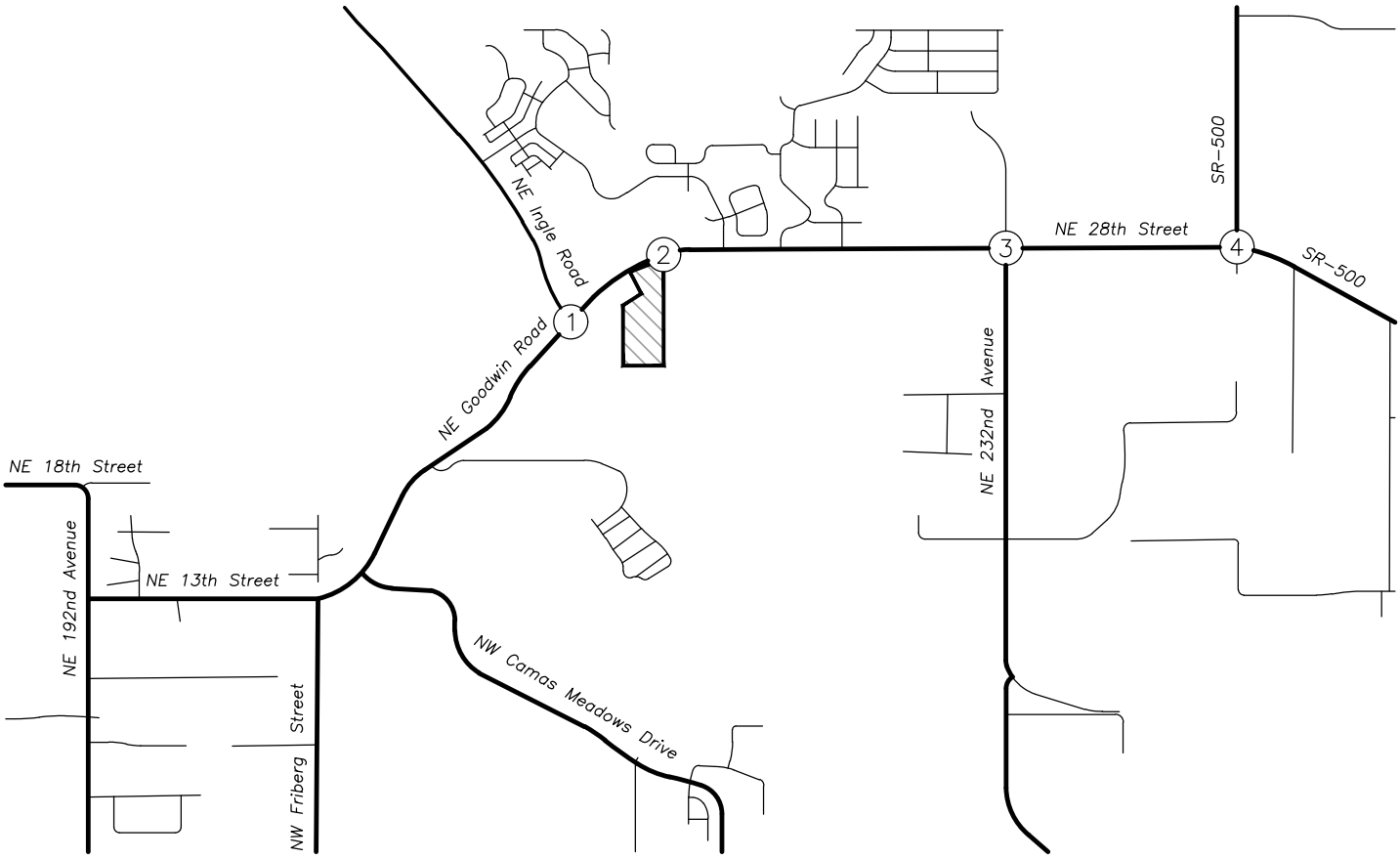
PM PEAK HOUR



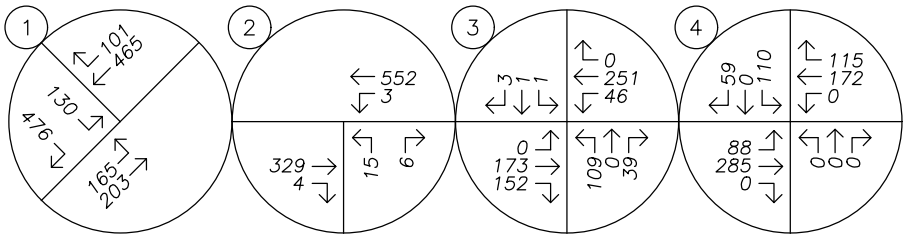
no scale

TRAFFIC VOLUMES
Year 2027 Background Conditions
AM & PM Peak Hours

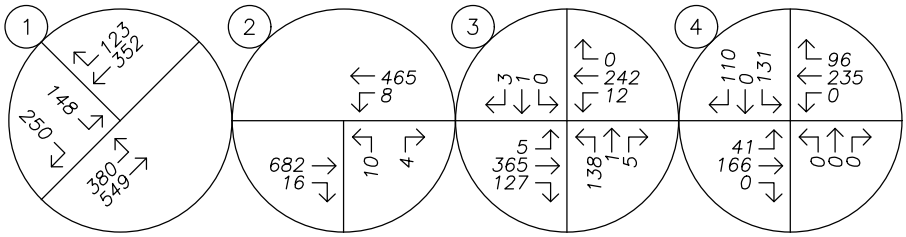
Figure 5



AM PEAK HOUR



PM PEAK HOUR



no scale

TRAFFIC VOLUMES
Year 2027 Buildout Conditions
AM & PM Peak Hours

Figure 6

Safety Analysis

Crash History Review

Using data obtained from the Washington Department of Transportation (WSDOT) Crash Data and Reporting Branch, a review of the most recent available five to six years of crash history (January 2019 to June 2024) at the non-site access study intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection.

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the PM peak hour represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection. Crash rates in excess of 1.00 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

With regard to crash severity, WSDOT classifies crashes in the following categories:

- *No Apparent Injury* (NA);
- *Possible Injury* (P);
- *Suspected Minor Injury* (SM);
- *Suspected Serious Injury* (SS); and
- *Fatality* or *Fatal Injury*.

Table 6 provides a summary of crash types while Table 7 summarizes crash severities and rates for each of the applicable study intersections. Crash data is included in the technical appendix to this report.

Table 6: Crash Type Summary

No.	Intersection	Crash Type							Total
		Rear End	Turn	Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	NE Ingle Road at NE Goodwin Road	0	7	0	0	0	1	0	8
3	NE 232nd Avenue at NE 28th Street	1	6	0	2	0	1	0	10
4	SR-500 at NE 28th Street	0	2	2	0	0	0	0	4

Table 7: Crash Severity and Rate Summary

No.	Intersection	Crash Severity					Total Crashes	AADT	Crash Rate
		NA	P	SM	SS	Unknown			
1	NE Ingle Road at NE Goodwin Road	4	1	3	0	0	8	12,420	0.32
3	NE 232nd Avenue at NE 28th Street	7	1	1	0	1	10	6,490	0.77
4	SR-500 at NE 28th Street	3	1	0	0	0	4	6,100	0.33

Per Table 6, two of the reported crashes at the study intersections involved bicyclists. The crashes include the following:

- One of the crashes occurred at the intersection of NE Ingle Road at NE Goodwin Road. The crash occurred when the driver of a northeast bound left-turning passenger car failed to yield right-of-way to a bicyclist at the intersection. One person involved in the collision was reported to have sustained injuries, where the crash was classified as *Suspected Minor Injury*.
- The second crash occurred at the intersection of NE 232nd Avenue at NE 28th Street. The crash occurred when the bicyclist conducted an improper turn/merge at the intersection and collided with a westbound traveling passenger car. The crash was classified as *No Apparent Injury*.

Based on a review of the crash history data, no significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.

Sight Distance Evaluation

Sight Distance Definitions and Methodologies

Intersection and stopping sight distances were measured at the proposed site access intersection along NE 28th Street. Sight distances were measured and evaluated at the intersection in accordance with standards established in *A Policy of Geometric Design of Highways and Streets*[2].

Intersection sight distance is an operational measure, intended to provide sufficient line of sight along the major-street so that a driver can enter the roadway without impeding the flow of through traffic. For intersection sight distance, the driver's eye is assumed to be 14.5 feet from the near-edge of the nearest travel lane (or traveled way) of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The oncoming vehicle driver's eye height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

[2] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.

Stopping sight distance is considered the minimum requirement to ensure safe operation of an intersection with respect to sight lines. This distance allows the driver of a vehicle traveling on the major-street to react to a turning vehicle or other object in the roadway and, if necessary, come to a complete stop to avoid a collision. To ensure safe operation, the extent of available intersection sight distance must at least equal the minimum required stopping sight distance. For stopping sight distance, the major-street approaching driver's eye height is 3.5 feet while an object height of 2 feet above the street pavement is used.

Based on a posted speed of 40 mph along NE 28th Street, the following minimum intersection and stopping sight distances are applicable to the proposed site access intersection:

- Intersection Sight Distance (Site Egress Left-turns): 445 feet to the east.
- Intersection Sight Distance (Site Egress Right-turns): 385 feet to the west.
- Stopping Sight Distance: 320 feet to the east, considering the major-street westbound approach grade is approximately 3.4% downhill over a 350-foot distance.
- Stopping Sight Distance: 305 feet to the west, considering the major-street eastbound approach grade is less than 3.0% over a 350-foot distance.

Sight Distance Measurements

Field measurements were conducted at the proposed site access location on Saturday, March 8, 2025. Sight distance to the east of the access location was measured to be in excess of 450 feet, while sight distance to the west was measured to be in excess of 500 feet to the west. Based on the sight distance analysis, adequate intersection and stopping sight distances are available at the proposed site access intersection to allow for safe and efficient operation along NE 28th Street. No sight distance related mitigation is necessary or recommended.

Warrant Analysis

Left-turn lane, preliminary traffic signal, and preliminary all-way stop-control warrants were examined for the study intersections where such treatments would be applicable.

Left-Turn Lane Warrants

Left-turn lane warrants were evaluated at the proposed site access intersection along NE 28th Street. A left-turn refuge lane is primarily a safety consideration for the major-street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants used were developed from the *National Cooperative Highway Research Project's* (NCHRP) *Report 457*. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through lanes.

Based on the analysis, left-turn lane warrants are not projected to be met at the site access intersection along NE 28th Street under the 2027 site buildout year. Accordingly, no new turn lanes are necessary or recommended as part of the proposed Reserve at Green Mountain project.

Preliminary Traffic Signal Warrants

Preliminary traffic signal warrants were examined for the unsignalized study intersections to determine whether the installation of a new traffic signal will be warranted at the intersections by the 2027 site buildout year. Based on the preliminary analysis following a review of Warrant 1 in the *Manual on Uniform Traffic Control Devices*, or MUTCD, traffic signal warrants are not projected to be met at any of the unsignalized study intersections by the 2027 site buildout year. Therefore, no new traffic signals are necessary or recommended as part of the proposed development application.

All-Way Stop-Control Warrants

To determine whether the installation of all-way stop-controls is warranted or nearing warrants at the applicable study intersections, the *Manual of Uniform Traffic Control Devices for Streets and Highways*[3] (MUTCD) was referenced. According to *Section 2B.12 All-Way Stop Control* of the MUTCD, installation of all-way stop controls may be considered at an intersection based on a review of the following warrants:

A. *All-Way Stop Control Warrant A: Crash Experience (see Section 2B.13)*

B. *All-Way Stop Control Warrant B: Sight Distance (see Section 2B.14)*

C. *All-Way Stop Control Warrant C: Transition to Signal Control or Transition to Yield Control at a Circular Intersection (see Section 2B.15)*

D. *All-Way Stop Control Warrant D: 8-Hour Volume (Vehicles, Pedestrians, Bicycles) (see Section 2B.16)*

E. *All-Way Stop Control Warrant E: Other Factors (see Section 2B.17)*

Note that according to the MUTCD, "[t]*he decision to install all-way stop control on site roadways open to public travel may be based on engineering judgment*" and "[w]*arrants are not a substitute for engineering judgment. The fact that a warrant for a particular traffic control device is met is not conclusive justification to install or not install all-way stop control.*"

Upon reviewing the aforementioned criteria, the following were concluded for each applicable warrant at the applicable unsignalized study intersections:

A. Three or less crashes over a 12-month period that could have been mitigated with the installation of all-way stop-controls were found at the study intersections via WSDOT crash data. Therefore, Warrant A is not met for any of the applicable study intersections.

B. Based on a preliminary review of intersection sight distances, no sight distance issues beyond the potential need to maintain foliage within the public right-of-way of applicable study intersections were found. Therefore, Warrant B is not met for any of the applicable study intersections.

C. Traffic signal warrants are not projected to be met at any of the applicable study intersections, whereby Warrant C is not met.

[3] Federal Highway Administration (FTA), American Traffic Safety Services Association (ATSSA), Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), 11th Edition, 2023.

D. Based on a preliminary review of the volume warrant at the applicable study intersections, Warrant D is not projected to be met by the 2027 site buildout year.

E. Neither the need to control left-turn conflicts or further accommodate current pedestrian/bicycle volumes at the study intersections is necessary. Additionally, the study intersections are not composed of two residential neighborhood collector roads of similar design. Therefore, Warrant E is not met for any of the applicable study intersections.

Based on the review of all-way stop-control warrants, the installation of all-way stop-controls at any of the applicable study intersections by the 2027 site buildout year is not necessary or recommended. Therefore, no all-way stop-control mitigation at the study intersections is recommended as part of the proposed development.

Pedestrian and Bicycle Safety

Intermittent sidewalks and bicycle lanes are in place along the site adjacent roadway of NE 28th Street. These facilities are generally provided along segments of the roadway where recent, higher density residential subdivision projects have been developed. As the area continues to redevelop with higher intensive uses, it is expected that segments of area roadways that do not currently have sidewalks or bicycle lanes will be reconstructed with such facilities overtime. Note that construction of these facilities is contingent on private development projects, such as the proposed Reserve at Green Mountain subdivision, which will redeveloped their associated half-street frontages. Since the proposed Reserve at Green Mountain subdivision will reconstruct its street frontage with NE 28th Street, no further mitigation to pedestrian and bicycle facilities are necessary and recommended as part of the development application.

Specific to safety related to students walking/biking between the project site and nearby schools, the nearest schools to the project site include the following:

- Union High School: An approximate 1.5 mile walking/biking distance to the southwest from the project site.
- Lacamas Lake Elementary School: An approximate 2 mile walking/biking distance to the southeast from the project site.
- Illahee Elementary School and Shahala Middle School: An approximately 2 mile walking/biking distance to the southwest from the project site.
- Harmony Elementary School: An approximate 2.5 mile walking/biking distance to the west from the project site.
- Skyridge Middle School: An approximate 2.5 mile walking/biking distance to the south from the project site.

Given the lengthy travel distances between the nearest schools and the project site, it is unlikely that students who reside at the Reserve at Green Mountain subdivision will walk or bike to school. Instead students may either travel to/from school via personal/family vehicles or will take a school bus, noting C-Tran does not currently offer transit services in the immediate site vicinity. School bus service to/from the project site will be coordinated with the applicable school districts. Based on the proposed site layout, school buses have the option of either stopping along NE 28th Street near the proposed site access intersection or enter the project site and circulate within the site internal streets. For either school bus service option, appropriate pedestrian and bicycle facilities will be constructed within site internal streets and along the project site's frontage with NE 28th Street. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Reserve at Green Mountain subdivision.

Access Spacing

According to Table 3 of the City of Camas' Engineering Design Standards[4], the minimum and maximum spacing standards for Arterial roadways (i.e. NE 28th Street) are 660 feet and 1,000 feet, respectively. The proposed site access intersection along NE 28th Street will be located approximately 1,330 feet east of the intersection of NE Ingle Road at NE Goodwin Road, and approximately 700 feet west of the intersection of N Boxwood Street at NE 28th Street (measured centerline-to-centerline). Therefore, the proposed site access will meet the City of Camas' access/intersection spacing standards, whereby no access related mitigation is necessary.

[4] City of Camas Washington, *Design Standards Manual*. 10 March 2025, https://www.cityofcamas.us/com-dev/page/camas-design-standards-manual.

Operational Analysis

Intersection Capacity Analysis

A capacity and delay analysis were conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM).[5]. Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

According to the City of Camas Engineering Design Standards, a minimum LOS C or better on minor and local streets, and LOS D on collector/arterials or better should be maintained for traffic operations.

According to Clark County's Unified Development Code, Title 40.350 – *Transportation and Circulation*, Clark County's performance standards require unsignalized intersections to operate at LOS E or better unless traffic signal warrants are met. If traffic signal warrants are met, the intersection is required to operate at LOS D or better. Individual movements at signalized intersections of regional significance are to operate with average delays of less than two cycle lengths or 240 seconds, whichever is less.

The study intersection along SR-500 operates under the jurisdiction of WSDOT. According to the Revised Code of Washington (RCW) 47.06.140(2):

> *The department of transportation, in consultation with local governments, shall set level of service standards for state highways and state ferry routes of statewide significance. Although the department shall consult with local governments when setting level of service standards, the department retains authority to make final decisions regarding level of service standards for state highways and state ferry routes of statewide significance. In establishing level of service standards for state highways and state ferry routes of statewide significance, the department shall consider the necessary balance between providing for the free interjurisdictional movement of people and goods and the needs of local communities using these facilities…*

Per WSDOT's online *Level of Service Standard* ArcGIS website.[6], the segment of SR-500 within the analysis area operates with an LOS C or better standard.

[5] Transportation Research Board, *Highway Capacity Manual 7th Edition*, 2022.

[6] WSDOT. (n.d.). *WSDOT - Level of Service Standard*. Map Viewer. https://wsdot.maps.arcgis.com/apps/mapviewer/index.html?layers=3f840aeeb1ba481c905270ca103cd1db

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 8 for the AM and PM peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

Table 8: Capacity Analysis Summary

Analysis Scenario	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1. NE Ingle Road at NE Goodwin Road (City of Camas)						
2025 Existing Conditions	A	9	-	A	7	-
2027 Background Conditions	B	12	-	A	9	-
2027 Buildout Conditions	B	13	-	A	9	-
2. Site Access at NE 28th Street (City of Camas)						
2025 Existing Conditions	B	12	<0.01	C	16	<0.01
2027 Background Conditions	B	14	<0.01	C	25	<0.01
2027 Buildout Conditions	C	17	0.07	C	24	0.08
3. NE 232nd Avenue at NE 28th Street (Clark County)						
2025 Existing Conditions	C	19	0.38	C	15	0.18
2027 Background Conditions	E	37	0.67	C	23	0.42
2027 Buildout Conditions	E	38	0.68	C	23	0.43
4. NE 242nd Avenue (SR-500) at NE 28th Street (WSDOT)						
2025 Existing Conditions	C	16	0.32	C	16	0.40
2027 Background Conditions	C	20	0.43	C	24	0.60
2027 Buildout Conditions	C	21	0.43	C	24	0.61

Based on the results of the operational analysis, all study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application.

Intersection Queuing Analysis

In accordance with the City of Camas Engineering Design Standards, a queuing analysis was conducted at the study intersections to determine whether sufficient storage is available at applicable turning movements to accommodate projected queues.

The queue lengths were projected based on the results of a Synchro/SimTraffic simulation, with the reported values representing the 95th percentile queue length. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

The projected 95th percentile queue lengths reported in the simulation are presented in Table 9 for the AM and PM peak hours. Note the reported queue lengths were rounded up to the nearest five feet. Available lane storages at applicable turning movements were rounded to the nearest five feet. Detailed queuing analysis worksheets are included in the technical appendix to this report.

Table 9: Queuing Analysis Summary

		Available Storage (ft)	AM Peak Hour 95th (ft)	PM Peak Hour 95th (ft)
1. NE Ingle Road at NE Goodwin Road				
2025 Existing Conditions	NEB LT	115	85	115
	NEB Through	-	70	95
	SWB Through	-	155	130
	SWB RT	100	50	60
	SEB LT	110	75	70
	SEB RT	-	140	75
2027 Background Conditions	NEB LT	115	115	**180**
	NEB Through	-	90	155
	SWB Through	-	265	180
	SWB RT	100	60	70
	SEB LT	110	105	110
	SEB RT	-	240	100
2027 Buildout Conditions	NEB LT	115	110	**175**
	NEB Through	-	100	145
	SWB Through	-	245	185
	SWB RT	100	55	70
	SEB LT	110	100	105
	SEB RT	-	230	105

Table Notes: ***BOLDED*** *text indicates queue length exceeds avaialble storage.*

Table 9: Queuing Analysis Summary (Continued)

		Available Storage (ft)	AM Peak Hour	PM Peak Hour
			95th (ft)	95th (ft)
2. Site Access at NE 28th Street				
2025 Existing Conditions	NB Lane	-	10	10
2027 Background Conditions	NB Lane	-	10	10
2027 Buildout Conditions	NB Lane	-	30	25
3. NE 232nd Avenue at NE 28th Street				
2025 Existing Conditions	NB Lane	-	75	65
	SB Lane	-	30	25
2027 Background Conditions	NB Lane	-	105	100
	SB Lane	-	25	35
2027 Buildout Conditions	NB Lane	-	110	90
	SB Lane	-	25	25
4. SR-500 at NE 28th Street				
2025 Existing Conditions	NB Lane	-	0	0
	SB Lane	-	80	90
2027 Background Conditions	NB Lane	-	0	0
	SB Lane	-	100	125
2027 Buildout Conditions	NB Lane	-	0	0
	SB Lane	-	110	130

Based on the queuing analysis, the northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. This extended queuing is projected to occur under the year 2027 analysis scenarios during the PM peak hour, with or without buildout of the proposed development. The maximum 95th percentile is projected to be approximately 180 feet, where the available striped storage area is approximately 115 feet. Although the 95th percentile queue may exceed the available striped storage area by approximately 65 feet (i.e., the length of 2 to 3 passenger cars), this excess queue can be accommodated by the northeast bound through lane, which experiences a 95th percentile queue of up to 155 feet for a total of 220 feet of queuing along the through lane. This 220-foot queue will not extend back to any other public intersection or driveway along NE Goodwin Road, whereby limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development.

Conclusions

The proposed development is projected to impact nine of the transportation facilities where proportionate share fees are being collected by the City of Vancouver. The proposed development application will need to contribute a proportionate share fee of $34,199 toward these transportation improvement projects.

No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.

Adequate intersection and stopping sight distances are available at the proposed site access intersection to allow for safe and efficient operation along NE 28th Street. No sight distance related mitigation is necessary or recommended.

Left-turn lane, traffic signal, and all-way stop-control warrants are not projected to be met at any of the applicable study intersections under any analysis scenario through the 2027 site buildout year. Accordingly, no new turn lanes or revisions to traffic controls are necessary or recommended as part of the proposed Reserve at Green Mountain project.

The proposed development will reconstruct its associated street frontage with NE 28th Street to include pedestrian and bicycle facilities in accordance with City of Camas street standards. Additionally, appropriate pedestrian and bicycle facilities will be constructed within site internal streets to accommodate student pickup/drop-off via school bus. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Reserve at Green Mountain subdivision, and no further mitigation to pedestrian and bicycle facilities are necessary and recommended.

All study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application.

The northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. However, this excess queue can be accommodated by the northeast bound through lane without extending back to any other public intersection or driveway along NE Goodwin Road. Limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur due to this queuing. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development.

Appendix A – Site Plan

Site Plan

Reserve at Green Mountain

Located in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

APPLICANT:
Pacific Lifestyle Homes
Contact: Nick Edwards
11815 NE 99th St., Ste 1200
Vancouver, WA 98682
(360) 597-7098
NickE@buildplh.com

OWNER:
Marwan Bahu
PO Box 774
San Clemente, CA 98607

PROJECT CONTACT:
PLS Engineering
Jayson Taylor, PE
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173192000
2625 NE Goodwin Road
Camas, WA 98607

LAND USE:
The applicant is proposing to subdivide approximately 11.67 acres into 38 single family detached lots, retaining the existing home one of the lots. The site is zoned R-7.5 zone with comprehensive plan designation of SFM. The development proposes to utilize density transfer with a request for additional flexibility request for lot area, width, and setbacks.

The applicant request the following minimum lot standards:
Minimum lot area = 4,500 sf
Minimum lot width = 45'
Minimum lot depth = 90'
Setbacks:
Front = 20'
Garage = 20' (same as general front setback)
Rear = 15'
Side = 5'
Street Side = 10'
Maximum building lot coverage = 50%
Maximum building lot coverage = 55% (single level home)

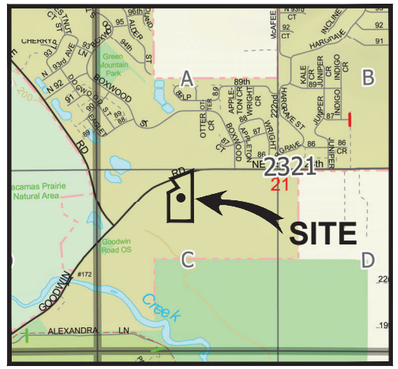
TRANSPORTAION:
Primary access to the site is provided from NE Goodwin Road/NE 28th Street. Frontage improvements along NE 28th Street will include additional right-of-way and pavement to meet the requirements for a 3-Lane Arterial. No lots will have direct vehicular access to NE 28th Street/Goodwin Road.

The internal public streets will be constructed according to standard detail number ST3. These streets will generally provide a 28' wide paved road within a 52' right-of-way with 5' sidewalks and 5' planter strips on each side.

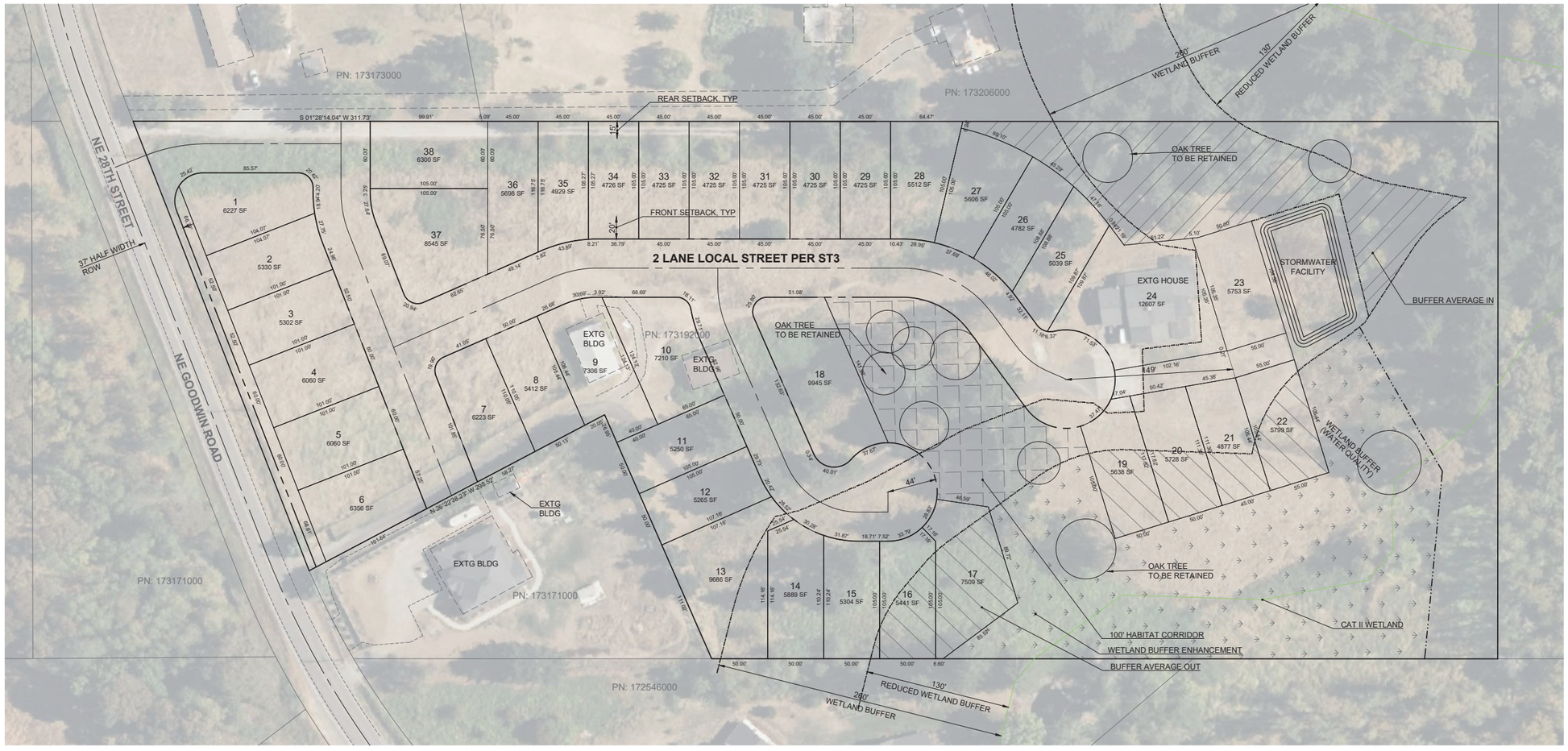
UTILITIES:
The City of Camas is the water and sewer purveyor for the site. Existing water and sewer lines run through NE 28th Street and NE Goodwin Road to the north. The applicant expects to utilize a grinder pump system for sanitary sewer service.

All onsite stormwater runoff will be routed to a stormwater detention facility prior to being released into a wetland to the south of the site. Stormwater from pollution generating surfaces will be treated prior to entering the detention facility.

CRITICAL AREAS:
A category II wetland is located at the south end of the site. An estimated boundary and buffer are shown on the site plan.



VICINITY MAP
NOT TO SCALE



Scale 1" = 50'
50 25 0 50

PLS ENGINEERING

Conceptual Plat For:

Reserve at Green Mountain

A Site Located in the City of Camas, WA

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6	

Project No.	3927
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	JMT
DRAFTED BY:	JMT
REVIEWED BY:	JMT

01
01

Appendix B – Trip Generation and Distribution

Trip Generation Calculations

RTC TAZ Data

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition
Site Trips - Existing Conditions

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	1

WARNING: Variable Quantity is less than Minimum Survey Size for Peak Hours

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	25%	75%	
Trip Ends	0	1	1

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	1	0	1

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	5	5	10

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	5	5	10

Source: Trip Generation Manual, 11th Edition

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition
Site Trips - Proposed Conditions

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	38

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	25%	75%	
Trip Ends	7	20	27

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	23	13	36

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	179	179	358

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	180	180	360

Source: Trip Generation Manual, 11th Edition

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition
Parcels 173206000 and 173173000

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	2

WARNING: Variable Quantity is less than Minimum Survey Size for Peak Hours

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	25%	75%	
Trip Ends	0	1	1

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	1	1	2

WEEKDAY

Trip Rate: 9.43

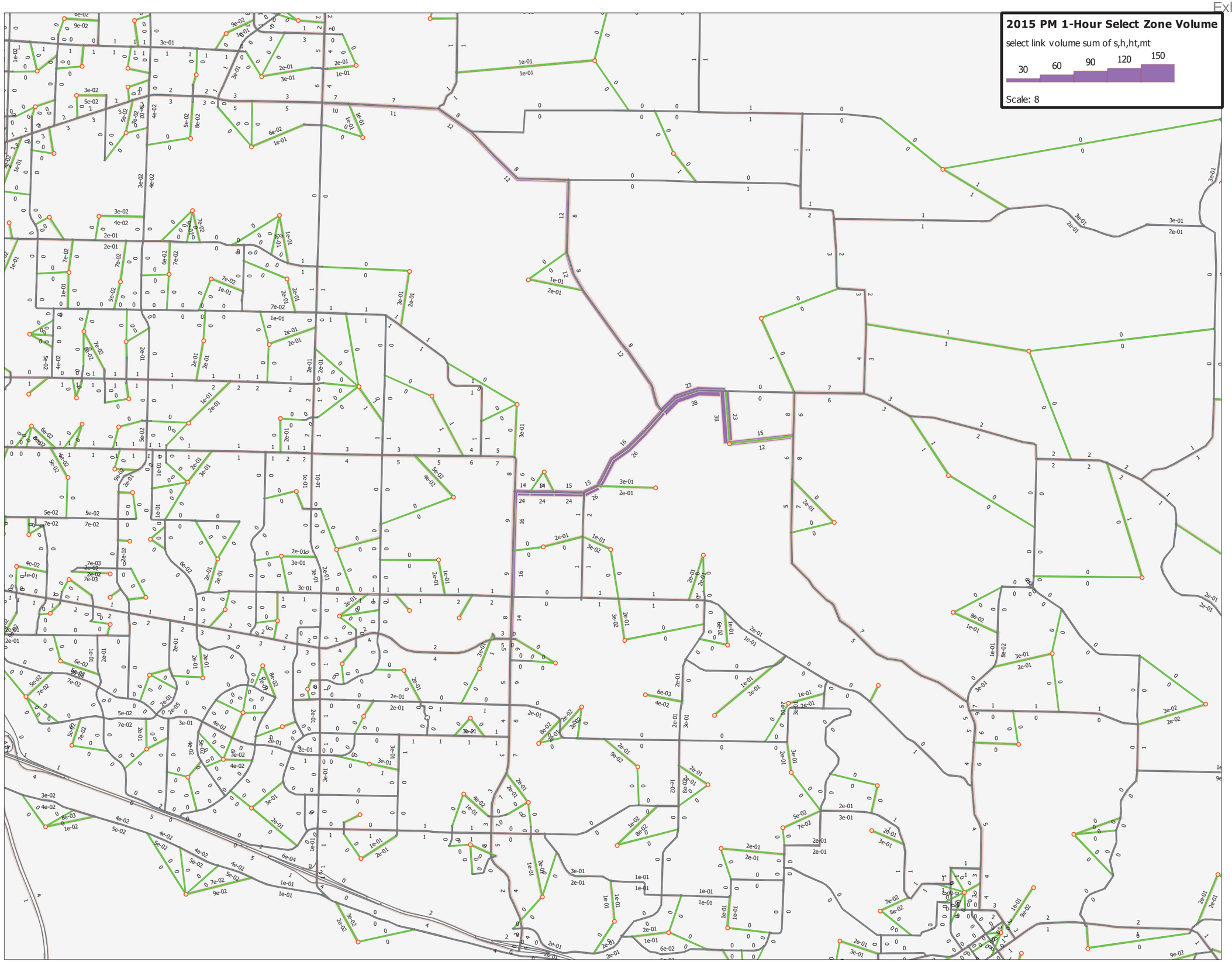
	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	9	9	18

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	9	9	18

Source: Trip Generation Manual, 11th Edition


2015 PM 1-Hour Select Zone Volume
select link volume sum of s,h,ht,mt
30
60
90
120
150
Scale: 8

Appendix C – Traffic Volumes

Traffic Counts

In-Process Trips

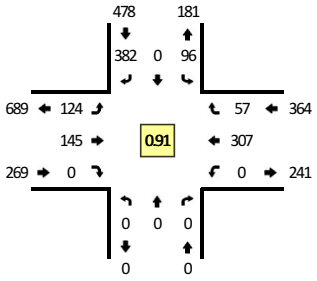
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

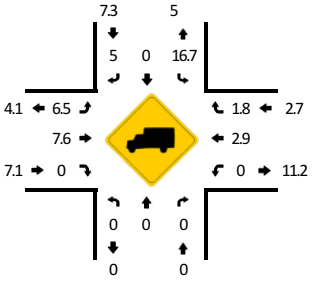
LOCATION: NE Ingle Rd -- NE Goodwin Rd/NE 28th St
CITY/STATE: Camas, WA

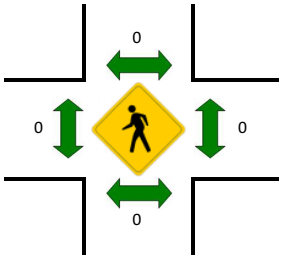
QC JOB #: 16956001
DATE: Wed, Mar 12 2025

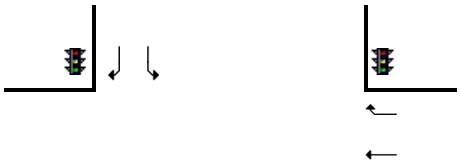
Peak-Hour: 7:50 AM -- 8:50 AM
Peak 15-Min: 8:35 AM -- 8:50 AM

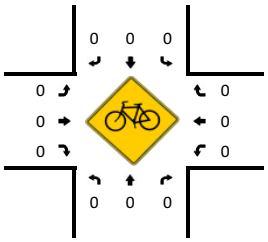


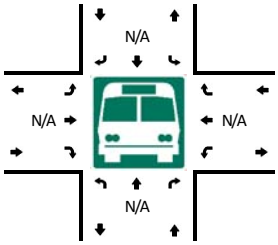




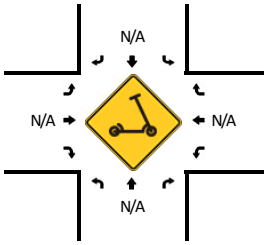












5-Min Count Period Beginning At	NE Ingle Rd (Northbound)				NE Ingle Rd (Southbound)				NE Goodwin Rd/NE 28th St (Eastbound)				NE Goodwin Rd/NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	9	0	15	0	6	8	0	0	0	10	6	0	54	
7:05 AM	0	0	0	0	3	0	15	0	6	7	0	0	0	12	7	0	50	
7:10 AM	0	0	0	0	9	0	9	0	7	8	0	0	0	20	1	0	54	
7:15 AM	0	0	0	0	3	0	12	0	7	6	0	0	0	15	6	0	49	
7:20 AM	0	0	0	0	6	0	19	0	6	10	0	0	0	14	3	0	58	
7:25 AM	0	0	0	0	9	0	20	0	8	8	0	0	0	20	4	0	69	
7:30 AM	0	0	0	0	7	0	25	0	8	7	0	0	0	19	8	0	74	
7:35 AM	0	0	0	0	11	0	22	0	5	7	0	0	0	35	6	0	86	
7:40 AM	0	0	0	0	6	0	35	0	8	10	0	0	0	24	4	0	87	
7:45 AM	0	0	0	0	12	0	31	0	3	15	0	0	0	33	4	0	98	
7:50 AM	0	0	0	0	8	0	39	0	6	23	0	0	0	23	4	0	103	
7:55 AM	0	0	0	0	5	0	31	0	4	12	0	0	0	24	5	0	81	863
8:00 AM	0	0	0	0	14	0	30	0	7	15	0	0	0	31	7	0	104	913
8:05 AM	0	0	0	0	7	0	25	0	13	12	0	0	0	27	5	0	89	952
8:10 AM	0	0	0	0	5	0	23	0	7	14	0	0	0	24	5	0	78	976
8:15 AM	0	0	0	0	6	0	36	0	4	5	0	0	0	20	4	0	75	1002
8:20 AM	0	0	0	0	6	0	32	0	7	10	0	0	0	23	9	0	87	1031
8:25 AM	0	0	0	0	13	0	45	0	17	7	0	0	0	22	4	0	108	1070
8:30 AM	0	0	0	0	2	0	38	0	10	12	0	0	0	18	1	0	81	1077
8:35 AM	0	0	0	0	9	0	45	0	10	11	0	0	0	37	3	0	115	1106
8:40 AM	0	0	0	0	8	0	20	0	12	9	0	0	0	30	7	0	86	1105
8:45 AM	0	0	0	0	13	0	18	0	27	15	0	0	0	28	3	0	104	1111
8:50 AM	0	0	0	0	5	0	21	0	11	15	0	0	0	25	3	0	80	1088
8:55 AM	0	0	0	0	8	0	13	0	9	12	0	0	0	15	4	0	61	1068

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	120	0	332	0	196	140	0	0	0	380	52	0	1220
Heavy Trucks	0	0	0		36	0	12		16	4	0		0	4	4		76
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

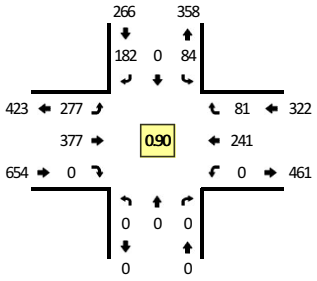
Type of peak hour being reported: Intersection Peak

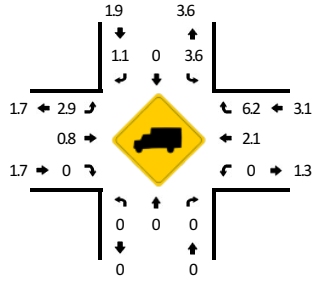
Method for determining peak hour: Total Entering Volume

LOCATION: NE Ingle Rd -- NE Goodwin Rd/NE 28th St
CITY/STATE: Camas, WA

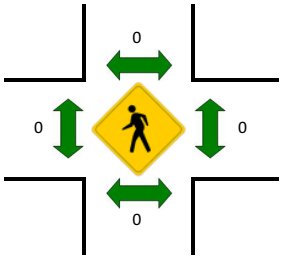
QC JOB #: 16956002
DATE: Wed, Mar 12 2025

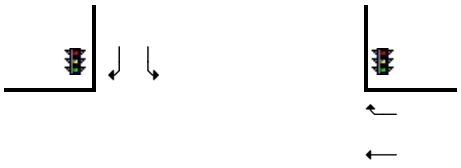
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

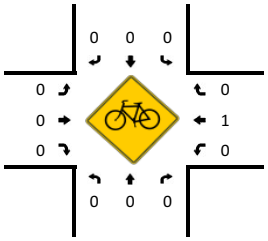


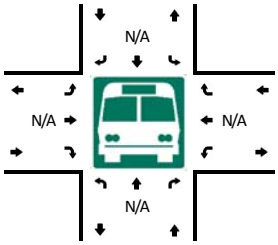


TRUE DATA TO IMPROVE MOBILITY

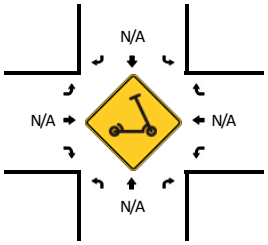












5-Min Count Period Beginning At	NE Ingle Rd (Northbound)				NE Ingle Rd (Southbound)				NE Goodwin Rd/NE 28th St (Eastbound)				NE Goodwin Rd/NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	10	0	8	0	17	34	0	0	0	11	9	0	89	
4:05 PM	0	0	0	0	12	0	9	0	13	24	0	0	0	17	7	0	82	
4:10 PM	0	0	0	0	10	0	12	0	26	29	0	0	0	21	9	0	107	
4:15 PM	0	0	0	0	6	0	17	0	25	27	0	0	0	15	3	0	93	
4:20 PM	0	0	0	0	12	0	17	0	23	22	0	0	0	15	3	0	92	
4:25 PM	0	0	0	0	7	0	15	0	34	24	0	0	0	16	4	0	100	
4:30 PM	0	0	0	0	5	0	12	0	28	29	0	0	0	18	15	0	107	
4:35 PM	0	0	0	0	4	0	11	0	12	27	0	0	0	23	4	0	81	
4:40 PM	0	0	0	0	7	0	20	0	19	25	0	0	0	26	11	0	108	
4:45 PM	0	0	0	0	4	0	15	0	18	36	0	0	0	22	8	0	103	
4:50 PM	0	0	0	0	6	0	18	0	21	31	0	0	0	23	3	0	102	
4:55 PM	0	0	0	0	11	0	12	0	16	29	0	0	0	15	3	0	86	1150
5:00 PM	0	0	0	0	6	0	10	0	19	50	0	0	0	21	6	0	112	1173
5:05 PM	0	0	0	0	3	0	18	0	29	24	0	0	0	21	4	0	99	1190
5:10 PM	0	0	0	0	9	0	14	0	29	28	0	0	0	13	5	0	98	1181
5:15 PM	0	0	0	0	13	0	21	0	32	36	0	0	0	15	8	0	125	1213
5:20 PM	0	0	0	0	8	0	23	0	23	32	0	0	0	18	7	0	111	1232
5:25 PM	0	0	0	0	8	0	8	0	31	30	0	0	0	26	7	0	110	1242
5:30 PM	0	0	0	0	5	0	17	0	19	18	0	0	0	14	6	0	79	1214
5:35 PM	0	0	0	0	6	0	16	0	27	34	0	0	0	15	8	0	106	1239
5:40 PM	0	0	0	0	10	0	15	0	23	32	0	0	0	18	4	0	102	1233
5:45 PM	0	0	0	0	14	0	11	0	13	31	0	0	0	17	7	0	93	1223
5:50 PM	0	0	0	0	5	0	20	0	19	20	0	0	0	26	3	0	93	1214
5:55 PM	0	0	0	0	9	0	13	0	15	28	0	0	0	20	9	0	94	1222

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	116	0	208	0	344	392	0	0	0	236	88	0	1384
Heavy Trucks	0	0	0		4	0	0		0	4	0		0	4	4		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

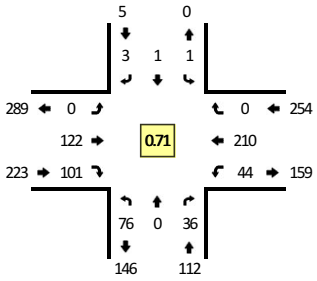
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

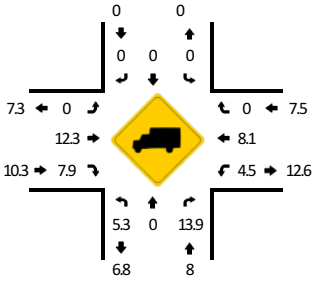
LOCATION: NE 232nd Ave -- NE 28th St
CITY/STATE: Fern Prairie, WA

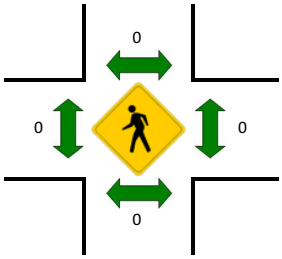
QC JOB #: 16956005
DATE: Wed, Mar 12 2025

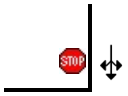
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

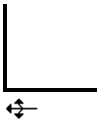


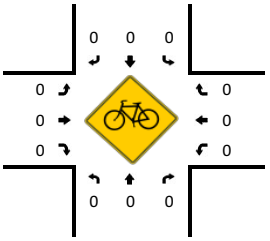


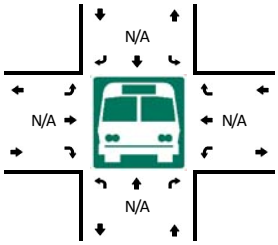


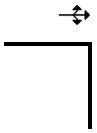


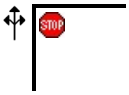


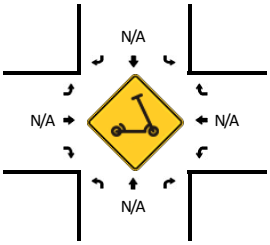












5-Min Count Period Beginning At	NE 232nd Ave (Northbound)				NE 232nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	0	0	0	0	0	0	0	0	7	9	0	1	11	2	0	32	
7:05 AM	2	0	0	0	0	0	0	0	0	6	3	0	0	9	0	0	20	
7:10 AM	3	0	2	0	0	0	0	0	0	8	0	0	1	9	1	0	24	
7:15 AM	1	0	0	0	0	0	0	0	0	5	1	0	0	12	0	0	19	
7:20 AM	2	0	0	0	0	0	0	0	0	8	3	0	2	7	0	0	22	
7:25 AM	1	0	0	0	1	0	1	0	0	7	8	0	2	29	0	0	49	
7:30 AM	5	0	0	0	0	0	0	0	0	8	0	0	1	16	0	0	30	
7:35 AM	1	0	0	0	0	0	0	0	0	2	9	0	7	18	0	0	37	
7:40 AM	2	0	0	0	0	0	0	0	0	11	5	0	6	16	0	0	40	
7:45 AM	4	0	6	0	1	0	0	0	0	9	8	0	6	15	0	0	49	
7:50 AM	4	0	4	0	0	0	0	0	0	10	20	0	18	18	0	0	74	
7:55 AM	14	0	8	0	0	0	0	0	0	15	13	0	7	12	0	0	69	465
8:00 AM	15	0	7	0	0	1	1	0	0	12	14	0	1	16	0	0	67	500
8:05 AM	9	0	6	0	0	0	0	0	0	14	9	0	0	20	0	0	58	538
8:10 AM	5	0	2	0	0	0	0	0	0	10	7	0	0	14	0	0	38	552
8:15 AM	6	0	1	0	0	0	0	0	0	4	5	0	0	18	0	0	34	567
8:20 AM	4	0	1	0	0	0	0	0	0	10	3	0	6	21	0	0	45	590
8:25 AM	1	0	0	0	0	0	0	0	0	10	5	0	3	19	0	0	38	579
8:30 AM	4	0	0	0	0	0	1	0	0	7	5	0	2	14	0	0	33	582
8:35 AM	4	0	1	0	0	0	1	0	0	9	4	0	1	17	0	0	37	582
8:40 AM	6	0	0	0	0	0	0	0	0	12	8	0	0	26	0	0	52	594
8:45 AM	2	0	3	0	0	0	0	0	0	15	5	0	0	16	0	0	41	586
8:50 AM	2	0	0	0	0	0	0	0	0	10	5	0	0	17	0	0	34	546
8:55 AM	3	0	1	0	0	0	0	0	0	11	6	0	0	13	0	0	34	511

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	132	0	76	0	0	4	4	0	0	148	188	0	104	184	0	0	840
Heavy Trucks	8	0	12		0	0	0		0	12	16		0	12	0		60
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

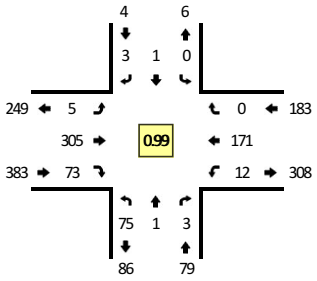
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

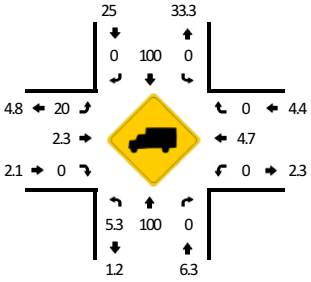
LOCATION: NE 232nd Ave -- NE 28th St
CITY/STATE: Fern Prairie, WA

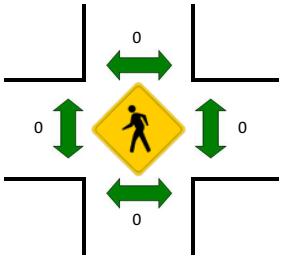
QC JOB #: 16956006
DATE: Wed, Mar 12 2025

Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 4:25 PM -- 4:40 PM

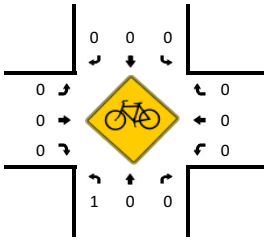


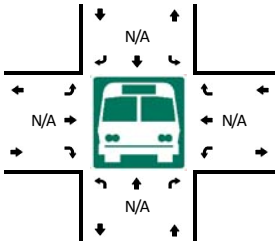




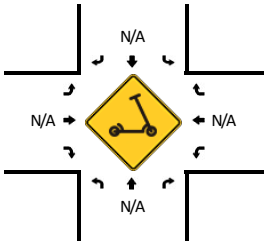












5-Min Count Period Beginning At	NE 232nd Ave (Northbound)				NE 232nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	0	1	0	0	0	0	0	0	27	8	0	1	8	0	0	50	
4:05 PM	8	0	0	0	0	0	0	0	0	30	6	0	1	14	0	0	59	
4:10 PM	8	0	0	0	0	0	0	0	1	22	7	0	1	15	0	0	54	
4:15 PM	3	0	1	0	0	0	1	0	0	20	6	0	0	13	0	0	44	
4:20 PM	1	0	0	0	0	0	0	0	0	24	6	0	0	11	0	0	42	
4:25 PM	7	1	1	0	0	0	1	0	1	27	6	0	0	9	0	0	53	
4:30 PM	8	0	1	0	0	0	0	0	0	24	7	0	0	18	0	0	58	
4:35 PM	6	0	0	0	0	0	1	0	0	24	3	0	0	19	0	0	53	
4:40 PM	5	0	0	0	0	0	1	0	0	18	6	0	1	18	0	0	49	
4:45 PM	8	0	0	0	0	0	0	0	2	27	4	0	3	17	0	0	61	
4:50 PM	4	0	0	0	0	0	0	0	0	30	3	0	2	10	0	0	49	
4:55 PM	4	0	0	0	0	0	0	0	0	20	7	0	2	13	0	0	46	618
5:00 PM	8	0	1	0	0	0	0	0	0	23	10	0	0	15	0	0	57	625
5:05 PM	6	0	0	0	0	0	0	0	1	36	3	0	0	14	0	0	60	626
5:10 PM	4	0	0	0	0	0	0	0	1	19	9	0	0	8	0	0	41	613
5:15 PM	9	0	0	0	0	1	0	0	0	31	9	0	1	12	0	0	63	632
5:20 PM	6	0	0	0	0	0	0	0	0	26	6	0	3	18	0	0	59	649
5:25 PM	6	0	1	0	0	0	0	0	0	21	8	0	0	12	0	0	48	644
5:30 PM	3	0	0	0	0	0	0	0	0	17	5	0	1	15	0	0	41	627
5:35 PM	5	0	1	0	0	0	0	0	1	30	3	0	0	13	0	0	53	627
5:40 PM	5	0	0	0	0	0	0	0	1	21	8	0	1	11	0	0	47	625
5:45 PM	6	0	0	0	0	0	1	0	0	21	12	0	2	15	0	0	57	621
5:50 PM	7	0	1	0	0	0	0	0	2	18	10	0	0	15	0	0	53	625
5:55 PM	7	0	0	0	0	0	0	0	0	25	0	0	1	11	0	0	44	623

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	84	4	8	0	0	0	8	0	4	300	64	0	0	184	0	0	656
Heavy Trucks	8	4	0		0	0	0		0	8	0		0	12	0		32
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	4	0	0		0	0	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

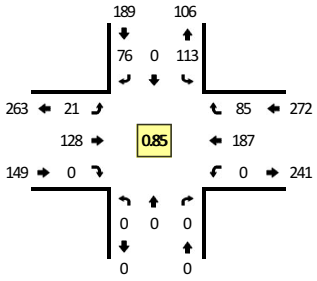
Type of peak hour being reported: Intersection Peak

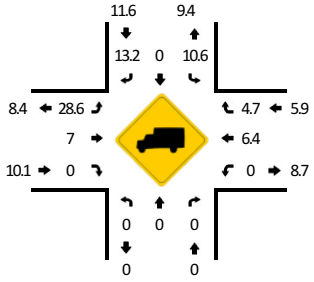
Method for determining peak hour: Total Entering Volume

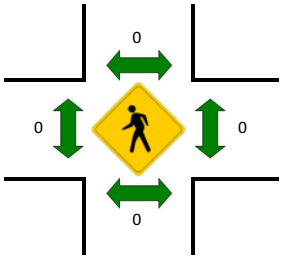
LOCATION: NE 242nd Ave -- NE 28th St
CITY/STATE: Fern Prairie, WA

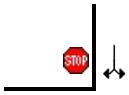
QC JOB #: 16956007
DATE: Wed, Mar 12 2025

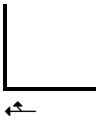
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:55 AM -- 8:10 AM

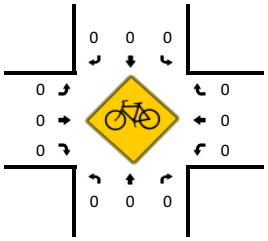


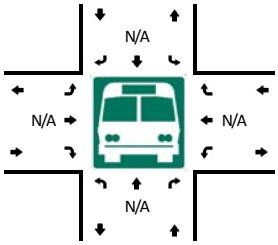


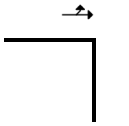




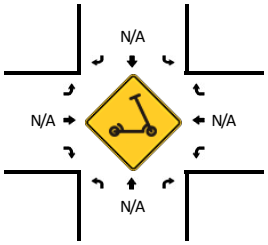












5-Min Count Period Beginning At	NE 242nd Ave (Northbound)				NE 242nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	3	0	3	4	0	0	0	10	2	0	23	
7:05 AM	0	0	0	0	4	0	3	0	0	6	0	0	0	6	6	0	25	
7:10 AM	0	0	0	0	0	0	3	0	2	8	0	0	0	10	7	0	30	
7:15 AM	0	0	0	0	4	0	5	0	1	4	0	0	0	10	10	0	34	
7:20 AM	0	0	0	0	7	0	3	0	1	7	0	0	0	9	13	0	40	
7:25 AM	0	0	0	0	8	0	8	0	1	7	0	0	0	17	7	0	48	
7:30 AM	0	0	0	0	8	0	7	0	0	8	0	0	0	13	10	0	46	
7:35 AM	0	0	0	0	9	0	5	0	1	0	0	0	0	18	4	0	37	
7:40 AM	0	0	0	0	10	0	11	0	0	13	0	0	0	15	7	0	56	
7:45 AM	0	0	0	0	4	0	10	0	2	12	0	0	0	13	6	0	47	
7:50 AM	0	0	0	0	4	0	14	0	2	14	0	0	0	21	5	0	60	
7:55 AM	0	0	0	0	15	0	6	0	3	19	0	0	0	12	8	0	63	509
8:00 AM	0	0	0	0	12	0	0	0	4	11	0	0	0	17	11	0	55	541
8:05 AM	0	0	0	0	10	0	6	0	3	21	0	0	0	16	6	0	62	578
8:10 AM	0	0	0	0	13	0	3	0	3	10	0	0	0	10	8	0	47	595
8:15 AM	0	0	0	0	12	0	2	0	1	3	0	0	0	16	7	0	41	602
8:20 AM	0	0	0	0	8	0	4	0	1	10	0	0	0	19	6	0	48	610
8:25 AM	0	0	0	0	7	0	6	0	2	5	0	0	0	15	4	0	39	601
8:30 AM	0	0	0	0	7	0	3	0	1	11	0	0	0	9	6	0	37	592
8:35 AM	0	0	0	0	6	0	3	0	3	7	0	0	0	18	10	0	47	602
8:40 AM	0	0	0	0	5	0	6	0	2	9	0	0	0	17	3	0	42	588
8:45 AM	0	0	0	0	10	0	3	0	2	12	0	0	0	16	11	0	54	595
8:50 AM	0	0	0	0	9	0	2	0	1	10	0	0	0	11	4	0	37	572
8:55 AM	0	0	0	0	8	0	3	0	1	10	0	0	0	9	4	0	35	544

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	148	0	48	0	40	204	0	0	0	180	100	0	720
Heavy Trucks	0	0	0		12	0	0		12	8	0		0	8	12		52
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

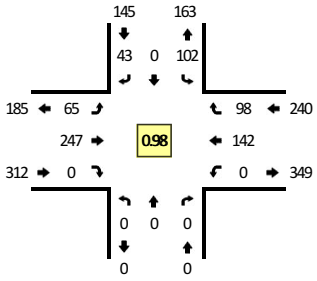
Type of peak hour being reported: Intersection Peak

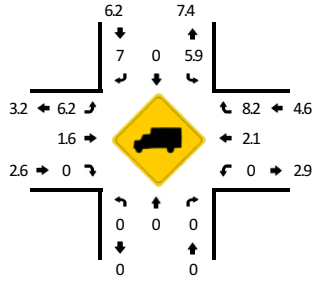
Method for determining peak hour: Total Entering Volume

LOCATION: NE 242nd Ave -- NE 28th St
CITY/STATE: Fern Prairie, WA

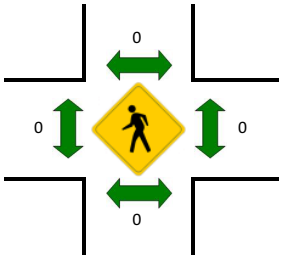
QC JOB #: 16956008
DATE: Wed, Mar 12 2025

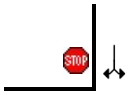
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

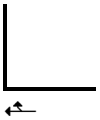


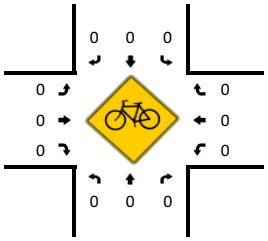


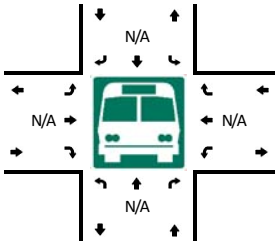


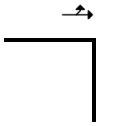




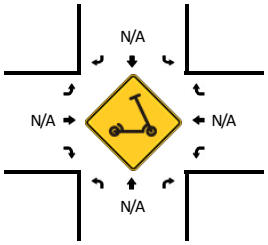












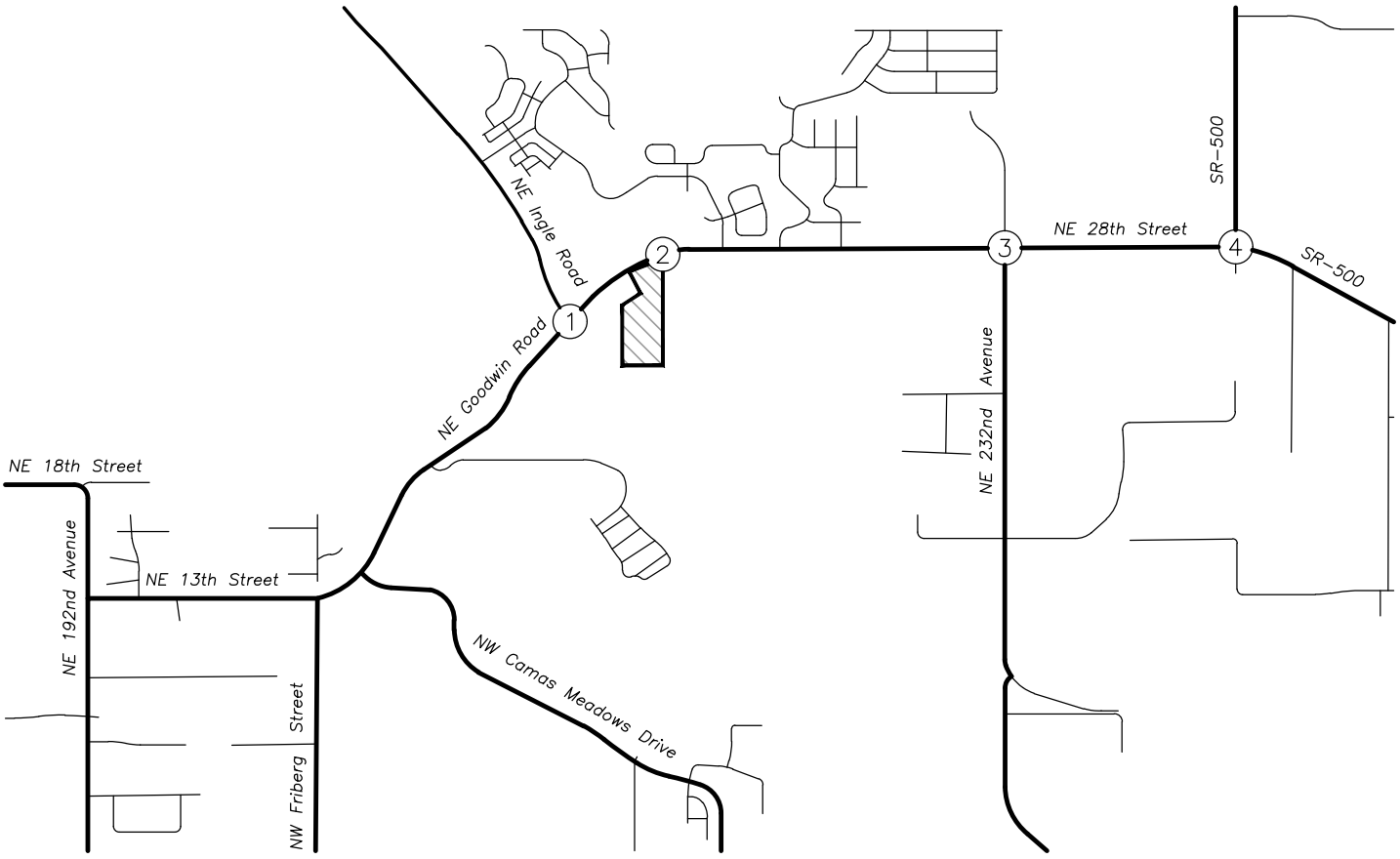
5-Min Count Period Beginning At	NE 242nd Ave (Northbound)				NE 242nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	9	0	1	0	5	18	0	0	0	6	8	0	47	
4:05 PM	0	0	0	0	5	0	3	0	6	29	0	0	0	12	6	0	61	
4:10 PM	0	0	0	0	9	0	6	0	6	14	0	0	0	11	11	0	57	
4:15 PM	0	0	0	0	6	0	1	0	4	19	0	0	0	10	8	0	48	
4:20 PM	0	0	0	0	6	0	3	0	4	18	0	0	0	7	9	0	47	
4:25 PM	0	0	0	0	6	0	4	0	5	26	0	0	0	8	9	0	58	
4:30 PM	0	0	0	0	9	0	5	0	5	21	0	0	0	13	9	0	62	
4:35 PM	0	0	0	0	8	0	1	0	4	17	0	0	0	17	8	0	55	
4:40 PM	0	0	0	0	8	0	8	0	6	12	0	0	0	14	9	0	57	
4:45 PM	0	0	0	0	9	0	3	0	10	19	0	0	0	13	9	0	63	
4:50 PM	0	0	0	0	5	0	2	0	8	24	0	0	0	10	6	0	55	
4:55 PM	0	0	0	0	10	0	4	0	2	13	0	0	0	10	7	0	46	656
5:00 PM	0	0	0	0	12	0	4	0	7	19	0	0	0	13	8	0	63	672
5:05 PM	0	0	0	0	11	0	2	0	10	26	0	0	0	10	7	0	66	677
5:10 PM	0	0	0	0	9	0	2	0	1	20	0	0	0	7	9	0	48	668
5:15 PM	0	0	0	0	4	0	2	0	3	26	0	0	0	13	7	0	55	675
5:20 PM	0	0	0	0	11	0	6	0	4	24	0	0	0	14	10	0	69	697
5:25 PM	0	0	0	0	10	0	5	0	5	18	0	0	0	5	8	0	51	690
5:30 PM	0	0	0	0	6	0	2	0	2	15	0	0	0	16	10	0	51	679
5:35 PM	0	0	0	0	8	0	2	0	8	20	0	0	0	11	7	0	56	680
5:40 PM	0	0	0	0	8	0	3	0	5	14	0	0	0	10	7	0	47	670
5:45 PM	0	0	0	0	11	0	3	0	4	19	0	0	0	11	10	0	58	665
5:50 PM	0	0	0	0	5	0	4	0	6	15	0	0	0	10	7	0	47	657
5:55 PM	0	0	0	0	6	0	1	0	6	16	0	0	0	12	3	0	44	655

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	128	0	32	0	72	260	0	0	0	120	96	0	708
Heavy Trucks	0	0	0		0	0	0		4	4	0		0	0	8		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

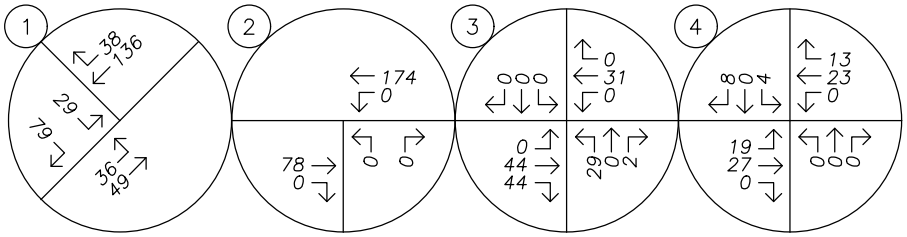
Comments:

Report generated on 3/18/2025 2:00 PM

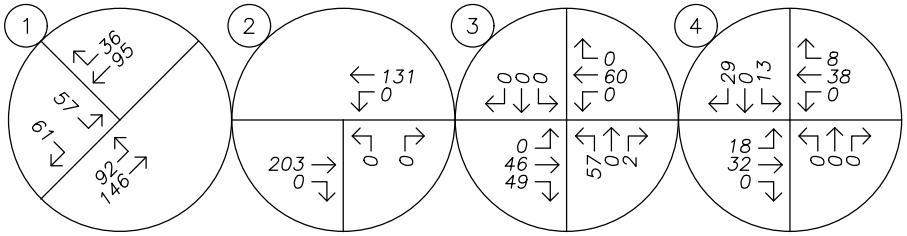
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212



AM PEAK HOUR



PM PEAK HOUR



no scale

TRAFFIC VOLUMES
In-Process Development Trips
AM & PM Peak Hours

Figure A
Reserve at Green Mountain
3/19/2025

Appendix D – Safety Analysis

Crash History Data

Left-Turn Lane Warrant Analysis

Preliminary Signal Warrant Analysis

Preliminary All-Way Stop-Control Warrant Analysis

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

CITY STREET INTERSECTIONS

Goodwin Rd @ Ingle Rd

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY INTERSECTING COUNTY ROAD MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY / SUSPENSE IND	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION
City Street	Clark	Camas	NE GOODWIN RD			0	NE INGLE RD						No	EA18227	02/18/2020	15:27	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight	Making Left Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	EF36498	11/01/2024	19:53	Suspected Minor Injury	1	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Dark-Street Lights On	Entering at angle	Making Right Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	EE09429	10/13/2023	13:05	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle	Making Left Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	EC98250	10/28/2022	15:07	Suspected Minor Injury	1	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car	At Intersection and Related	Raining	Wet	Daylight	Entering at angle	Making Left Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	ED96903	09/05/2023	11:15	Suspected Minor Injury	1	0	1	0	1	Passenger Car		At Intersection and Related	Clear	Dry	Daylight	Vehicle Strikes Pedalcyclist	Making Left Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	EB31078	05/10/2021	08:30	No Apparent Injury	0	0	2	0	0	Passenger Car	Truck (Flatbad,Van,etc)	At Intersection and Related	Clear	Dry	Daylight	Entering at angle	Making Left Turn
City Street	Clark	Camas	NE INGLE RD			2801	NE GOODWIN RD						No	EC42752	05/02/2022	17:00	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car	At Intersection and Related	Clear	Wet	Daylight	Entering at angle	Making Left Turn
City Street	Clark	Camas	NE INGLE RD			0	NE GOODWIN RD						No	E966064	09/20/2019	16:58	Possible Injury	2	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Overcast	Dry	Daylight	Entering at angle	Making Left Turn

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

CITY STREET INTERSECTIONS

Goodwin Rd @ Ingle Rd

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
Going Straight Ahead	West	North	East	West	Distractions Outside Vehicle			None									Lane of Primary Trafficway	1140563.25	118372.87
Going Straight Ahead	Northwest	Southwest	Northeast	Southwest	Did Not Grant RW to Vehicle			None									Intersecting Trafficway	1140562.72	118372.88
Going Straight Ahead	North	East	East	West	Disregard Traffic Sign and Signals			None									Lane of Primary Trafficway	1140562.72	118372.88
Going Straight Ahead	Northwest	Northeast	Northeast	Southwest	Did Not Grant RW to Vehicle			None									Lane of Primary Trafficway	1140562.72	118372.88
	South	West			Did Not Grant R/W to Non Motorist									None			Lane of Primary Trafficway	1140562.72	118372.88
Going Straight Ahead	North	East	East	West	Did Not Grant RW to Vehicle			None									Lane of Primary Trafficway	1140562.72	118372.88
Going Straight Ahead	Northwest	Northeast	Northeast	Southwest	Unknown Distraction			None									Lane of Primary Trafficway	1140562.72	118372.88
Going Straight Ahead	West	North	North	South	Did Not Grant RW to Vehicle			None									Lane of Primary Trafficway	1140563.26	118372.88

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

COUNTY ROAD INTERSECTIONS

28th St (Co Rd # 93350, mp 3.070 - 3.110) @ 232nd Ave (Co Rd # 30950, mp 2.870 - 2.890)

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY INTERSECTING COUNTY ROAD MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY / SUSPENSE IND	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION
County Road	Clark		30950	2.890			93350	3.090					No	EE81852	05/28/2024	14:30	No Apparent Injury	0	0	1	0	0	Truck & Trailer		At Intersection and Related	Overcast	Dry	Daylight	Utility Pole	Making Right Turn
County Road	Clark		93350	3.090			30950	2.890					No	E923671	05/23/2019	16:54	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - one left turn - one straight	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	EB42601	06/15/2021	18:31	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	Entering at angle	Making Right Turn
County Road	Clark		93350	3.090			30950	2.890					No	EA02765	12/20/2019	09:12	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	From same direction - one left turn - one straight	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	EB53840	07/20/2021	15:10	Suspected Minor Injury	3	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear	Dry	Daylight	Entering at angle	Making Left Turn
County Road	Clark		93350	3.090			30950	2.890					No	EB10619	02/28/2021	16:35	No Apparent Injury	0	0	1	0	1	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear	Dry	Daylight	Vehicle Strikes Pedalcyclist	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	EB69640	09/01/2021	11:59	No Apparent Injury	0	0	1	0	0	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear	Dry	Daylight	Utility Pole	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	EE74231	02/18/2024	15:52	Unknown	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Overcast	Unknown	Other	Entering at angle	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	ED64349	05/21/2023	16:55	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Overcast	Dry	Daylight	From same direction - one right turn - one straight	Going Straight Ahead
County Road	Clark		93350	3.090									No	EA84265	11/24/2020	15:25	Possible Injury	2	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	Driveway Related but Not at Driveway	Overcast	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

COUNTY ROAD INTERSECTIONS

28th St (Co Rd # 93350, mp 3.070 - 3.110) @ 232nd Ave (Co Rd # 30950, mp 2.870 - 2.890)

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
	West	South			None												Past the Outside Shoulder of Primary Trafficway	1145581.94	119082.99
Making Left Turn	East	West	East	South	Inattention	Follow Too Closely		None									Lane of Primary Trafficway	1145581.43	119082.29
Stopped at Signal or Stop Sign	West	South	South	West	Exceeding Reas. Safe Speed			None									Intersecting Trafficway	1145581.94	119082.99
Making Left Turn	East	West	East	South	Follow Too Closely			None									Lane of Primary Trafficway	1145581.43	119082.28
Going Straight Ahead	South	West	East	West	Did Not Grant RW to Vehicle	Unknown Distraction		None									Lane of Primary Trafficway	1145581.94	119082.99
	East	West			None									Improper Turn/Merge			Lane of Primary Trafficway	1145581.94	119082.99
	East	West			Other Contributing Circ Not Listed												Past the Outside Shoulder of Primary Trafficway	1145581.94	119082.99
Making Left Turn	West	East	South	Northwest	None			Unknown Distraction									Lane of Primary Trafficway	1145581.94	119082.99
Making Right Turn	West	East	West	South	Distracted by Adjusting Vehicle Cntrls			None									Lane of Primary Trafficway	1145581.94	119082.99
Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped	Follow Too Closely			None									Lane of Primary Trafficway	1145581.94	119082.99

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

STATE ROUTE INTERSECTIONS

SR 500 (aka 242nd Ave / Dresser Rd, mp 13.82 - 13.86) @ 28th St (Co Rd # 93350, mp 3.570 - 3.590)

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY INTERSECTING COUNTY ROAD MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY / SUSPENSE IND	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION
State Route	Clark		500	13.84									No	EF31345	10/28/2024	07:59	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Driveway within Major Intersection	Overcast	Wet	Daylight	From opposite direction - one left turn - one straight	Making Left Turn
State Route	Clark		500	13.84									No	E961000	09/04/2019	11:57	Possible Injury	2	0	2	0	0	Passenger Car	Truck Tractor & Semi-Trailer	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle	Going Straight Ahead
State Route	Clark		500	13.84									No	EB87073	11/06/2021	15:55	No Apparent Injury	0	0	2	0	0	Passenger Car	Passenger Car	At Driveway within Major Intersection	Raining	Wet	Daylight	Entering at angle	Starting in Traffic Lane
State Route	Clark		500	13.84									No	ED77436	07/04/2023	16:05	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle	Starting in Traffic Lane

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

STATE ROUTE INTERSECTIONS

SR 500 (aka 242nd Ave / Dresser Rd, mp 13.82 - 13.86) @ 28th St (Co Rd # 93350, mp 3.570 - 3.590)

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
Going Straight Ahead	North	East	South	North	Did Not Grant RW to Vehicle			None									Lane 1 Increasing Milepost	1148224.12	119052.38
Going Straight Ahead	North	South	East	West	Under Influence of Drugs			None									Lane 1 Decreasing Milepost	1148229.61	119051.46
Going Straight Ahead	North	South	East	West	Did Not Grant RW to Vehicle			None									Lane 1 Increasing Milepost	1148221.08	119048
Making Left Turn	West	East	West	North	Improper Turn/Merge			None									Lane 1 Increasing Milepost	1148221.08	119048

Left-Turn Lane Warrant Analysis

Project: Reserve at Green Mountain
Intersection: Site Access at NE 28th Street
Date: 3/19/2025
Scenario: 2027 Buildout Conditions - AM Peak Hour (WB)

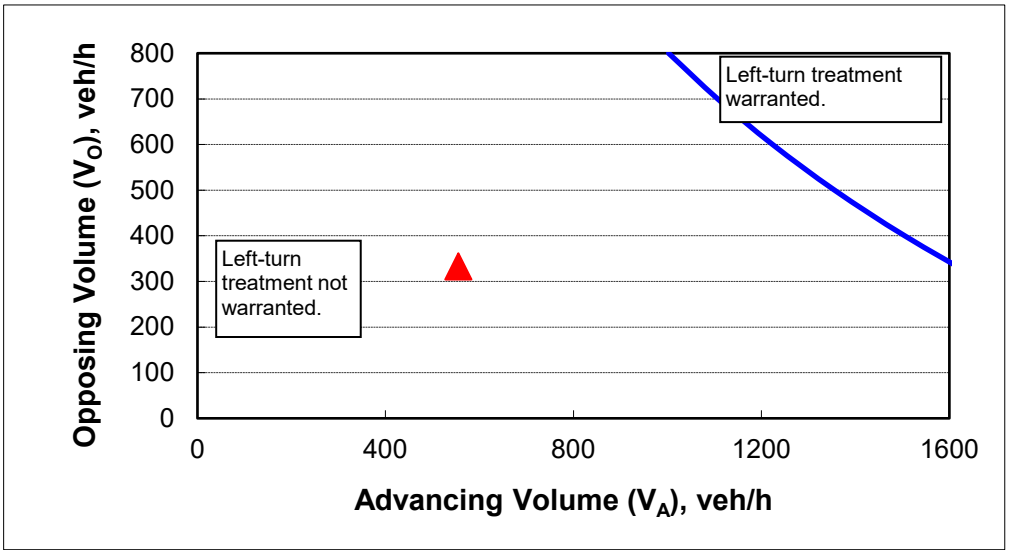
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	40
Percent of left-turns in advancing volume (V_A), %:	1%
Advancing volume (V_A), veh/h:	555
Opposing volume (V_O), veh/h:	333

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1617
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Reserve at Green Mountain
Intersection: Site Access at NE 28th Street
Date: 3/19/2025
Scenario: 2027 Buildout Conditions - PM Peak Hour (WB)

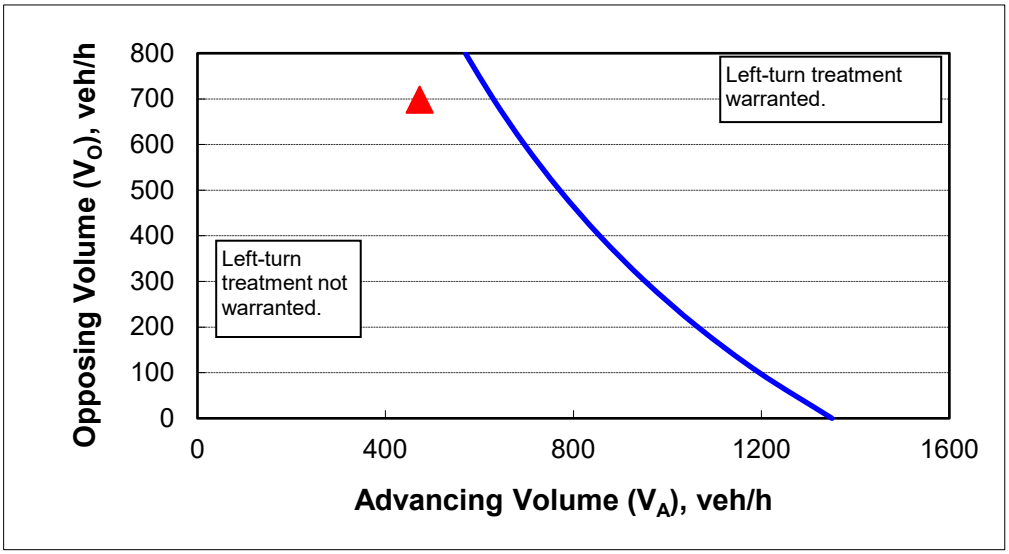
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	40
Percent of left-turns in advancing volume (V_A), %:	2%
Advancing volume (V_A), veh/h:	473
Opposing volume (V_O), veh/h:	698

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	631
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Traffic Signal Warrant Analysis

Project: Reserve at Green Mountain
Date: 3/19/2025
Scenario: 2027 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	Site Access
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	1171	PM Peak Hour Volumes:	13

Warrant Used:

_____ 100 percent of standard warrants used
X 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	11,710	6,200	
Minor Street*	130	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	11,710	9,300	
Minor Street*	130	950	**No**
Combination Warrant			
Major Street	11,710	7,440	
Minor Street*	130	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

Project: Reserve at Green Mountain
Date: 3/19/2025
Scenario: 2027 Buildout Conditions

	Major Street:	Minor Street:
	NE 28th Street	NE 232nd Avenue
Number of Lanes:	1	1
PM Peak Hour Volumes:	751	143

Warrant Used:

_____	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	7,510	6,200	
Minor Street*	1,430	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	7,510	9,300	
Minor Street*	1,430	950	**No**
Combination Warrant			
Major Street	7,510	7,440	
Minor Street*	1,430	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

Project: Reserve at Green Mountain
Date: 3/19/2025
Scenario: 2027 Buildout Conditions

Major Street:	NE 28th Street/SR-500	Minor Street:	SR-500 (North Leg)
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	538	PM Peak Hour Volumes:	214

Warrant Used:

_____ 100 percent of standard warrants used
X 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	5,380	6,200	
Minor Street*	2,140	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	5,380	9,300	
Minor Street*	2,140	950	**No**
Combination Warrant			
Major Street	5,380	7,440	
Minor Street*	2,140	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Multi-Way Stop Warrant Analysis

Project: Reserve at Green Mountain
Date: 3/19/2025
Scenario: 2027 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	Site Access
PM Peak Hour Volumes:	1172	PM Peak Hour Volumes:	14

Warrant Used:

_____	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	11,720	3,717	
Minor Street	140	2,478	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Multi-Way Stop Warrant Analysis

Project: Reserve at Green Mountain
Date: 3/19/2025
Scenario: 2027 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	NE 232nd Avenue
PM Peak Hour Volumes:	751	PM Peak Hour Volumes:	149

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	7,510	3,717	
Minor Street	1,490	2,478	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Multi-Way Stop Warrant Analysis

Project: Reserve at Green Mountain
Date: 3/19/2025
Scenario: 2027 Buildout Conditions

Major Street:	NE 28th Street/SR-500	Minor Street:	SR-500 (North Leg)
PM Peak Hour Volumes:	538	PM Peak Hour Volumes:	241

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	5,380	3,717	
Minor Street	2,410	2,478	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Appendix E – Operation Analysis

Level of Service Descriptions

Synchro Capacity Reports

SimTraffic Queuing Reports

LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	96	382	124	145	307	57
Future Volume (veh/h)	96	382	124	145	307	57
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1856	1856
Adj Flow Rate, veh/h	105	94	136	159	337	20
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	7	7	7	7	3	3
Cap, veh/h	236	210	565	991	522	442
Arrive On Green	0.14	0.14	0.11	0.55	0.28	0.28
Sat Flow, veh/h	1711	1522	1711	1796	1856	1572
Grp Volume(v), veh/h	105	94	136	159	337	20
Grp Sat Flow(s),veh/h/ln	1711	1522	1711	1796	1856	1572
Q Serve(g_s), s	1.6	1.6	1.3	1.3	4.6	0.3
Cycle Q Clear(g_c), s	1.6	1.6	1.3	1.3	4.6	0.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	236	210	565	991	522	442
V/C Ratio(X)	0.45	0.45	0.24	0.16	0.65	0.05
Avail Cap(c_a), veh/h	1211	1077	752	1891	1249	1058
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	11.5	5.4	3.2	9.1	7.6
Incr Delay (d2), s/veh	1.3	1.5	0.2	0.1	1.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.5	0.2	0.1	1.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	12.8	13.0	5.6	3.3	10.5	7.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	199			295	357	
Approach Delay, s/veh	12.9			4.3	10.3	
Approach LOS	B			A	B	

Timer - Assigned Phs		4		6	7	8
Phs Duration (G+Y+Rc), s		20.5		8.5	7.8	12.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		30.5		20.5	6.5	19.5
Max Q Clear Time (g_c+I1), s		3.3		3.6	3.3	6.6
Green Ext Time (p_c), s		0.8		0.5	0.1	1.5

Intersection Summary	
HCM 7th Control Delay, s/veh	8.8
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	241	0	0	363	1	1
Future Vol, veh/h	241	0	0	363	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	11	11	3	3	2	2
Mvmt Flow	265	0	0	399	1	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	265	0	664	265
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	399	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1293	-	426	774
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	678	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1293	-	426	774
Mov Cap-2 Maneuver	-	-	-	-	426	-
Stage 1	-	-	-	-	780	-
Stage 2	-	-	-	-	678	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	11.58
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	549	-	-	1293	-
HCM Lane V/C Ratio	0.004	-	-	-	-
HCM Ctrl Dly (s/v)	11.6	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	122	101	44	210	0	76	0	36	1	1	3
Future Vol, veh/h	0	122	101	44	210	0	76	0	36	1	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	10	10	10	8	8	8	8	8	8	0	0	0
Mvmt Flow	0	172	142	62	296	0	107	0	51	1	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	296	0	0	314	0	0	663	663	243	592	734	296
Stage 1	-	-	-	-	-	-	243	243	-	420	420	-
Stage 2	-	-	-	-	-	-	420	420	-	172	314	-
Critical Hdwy	4.2	-	-	4.18	-	-	7.18	6.58	6.28	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.272	-	-	3.572	4.072	3.372	3.5	4	3.3
Pot Cap-1 Maneuver	1221	-	-	1213	-	-	366	374	781	421	350	748
Stage 1	-	-	-	-	-	-	747	694	-	615	593	-
Stage 2	-	-	-	-	-	-	599	579	-	835	660	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1221	-	-	1213	-	-	341	351	781	370	328	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	341	351	-	370	328	-
Stage 1	-	-	-	-	-	-	747	694	-	578	557	-
Stage 2	-	-	-	-	-	-	558	544	-	781	660	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.41	18.84	12.12
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	416	1221	-	-	312	-	-	512
HCM Lane V/C Ratio	0.379	-	-	-	0.051	-	-	0.014
HCM Ctrl Dly (s/v)	18.8	0	-	-	8.1	0	-	12.1
HCM Lane LOS	C	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	1.7	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	65	247	0	0	142	98	0	0	0	102	0	48
Future Vol, veh/h	65	247	0	0	142	98	0	0	0	102	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	3	3	3	5	5	5	0	0	0	6	6	6
Mvmt Flow	66	252	0	0	145	100	0	0	0	104	0	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	245	0	0	252	0	0	530	630	252	580	580	195
Stage 1	-	-	-	-	-	-	385	385	-	195	195	-
Stage 2	-	-	-	-	-	-	145	245	-	385	385	-
Critical Hdwy	4.13	-	-	4.15	-	-	7.1	6.5	6.2	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Follow-up Hdwy	2.227	-	-	2.245	-	-	3.5	4	3.3	3.554	4.054	3.354
Pot Cap-1 Maneuver	1315	-	-	1296	-	-	463	401	792	420	421	836
Stage 1	-	-	-	-	-	-	642	614	-	798	732	-
Stage 2	-	-	-	-	-	-	863	707	-	630	604	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1315	-	-	1296	-	-	410	378	792	395	396	836
Mov Cap-2 Maneuver	-	-	-	-	-	-	410	378	-	395	396	-
Stage 1	-	-	-	-	-	-	605	578	-	798	732	-
Stage 2	-	-	-	-	-	-	812	707	-	593	569	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.64	0	0	16.12
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	375	-	-	1296	-	-	476
HCM Lane V/C Ratio	-	0.05	-	-	-	-	-	0.322
HCM Ctrl Dly (s/v)	0	7.9	0	-	0	-	-	16.1
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	1.4

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	84	182	277	377	241	81
Future Volume (veh/h)	84	182	277	377	241	81
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1856	1856
Adj Flow Rate, veh/h	93	29	308	419	268	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	3	3
Cap, veh/h	194	172	688	1074	445	369
Arrive On Green	0.11	0.11	0.18	0.57	0.24	0.24
Sat Flow, veh/h	1781	1585	1781	1870	1856	1539
Grp Volume(v), veh/h	93	29	308	419	268	26
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1856	1539
Q Serve(g_s), s	1.4	0.5	3.1	3.5	3.6	0.4
Cycle Q Clear(g_c), s	1.4	0.5	3.1	3.5	3.6	0.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	194	172	688	1074	445	369
V/C Ratio(X)	0.48	0.17	0.45	0.39	0.60	0.07
Avail Cap(c_a), veh/h	1129	1004	1033	2173	1176	975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	11.5	5.3	3.3	9.6	8.4
Incr Delay (d2), s/veh	1.8	0.5	0.5	0.2	1.3	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.3	0.1	1.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	13.7	11.9	5.8	3.5	10.9	8.4
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	122			727	294	
Approach Delay, s/veh	13.3			4.5	10.7	
Approach LOS	B			A	B	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			20.8		7.6	9.5	11.3
Change Period (Y+Rc), s			4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s			33.0		18.0	10.5	18.0
Max Q Clear Time (g_c+I1), s			5.5		3.4	5.1	5.6
Green Ext Time (p_c), s			2.5		0.2	0.4	1.2

Intersection Summary	
HCM 7th Control Delay, s/veh	7.0
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	460	1	1	321	1	0
Future Vol, veh/h	460	1	1	321	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	511	1	1	357	1	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	512	0	871	512
Stage 1	-	-	-	-	512	-
Stage 2	-	-	-	-	359	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1048	-	322	562
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1048	-	321	562
Mov Cap-2 Maneuver	-	-	-	-	321	-
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	706	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.03	16.24
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	321	-	-	6	-
HCM Lane V/C Ratio	0.003	-	-	0.001	-
HCM Ctrl Dly (s/v)	16.2	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	305	73	12	171	0	75	1	3	0	1	3
Future Vol, veh/h	5	305	73	12	171	0	75	1	3	0	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	4	4	4	6	6	6	25	25	25
Mvmt Flow	5	308	74	12	173	0	76	1	3	0	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	382	0	0	553	552	345	516	589	173
Stage 1	-	-	-	-	-	-	355	355	-	197	197	-
Stage 2	-	-	-	-	-	-	197	197	-	319	392	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.16	6.56	6.26	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Follow-up Hdwy	2.218	-	-	2.236	-	-	3.554	4.054	3.354	3.725	4.225	3.525
Pot Cap-1 Maneuver	1404	-	-	1166	-	-	438	436	689	435	391	815
Stage 1	-	-	-	-	-	-	654	623	-	755	697	-
Stage 2	-	-	-	-	-	-	795	730	-	647	568	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1404	-	-	1166	-	-	428	429	689	425	385	815
Mov Cap-2 Maneuver	-	-	-	-	-	-	428	429	-	425	385	-
Stage 1	-	-	-	-	-	-	651	620	-	746	689	-
Stage 2	-	-	-	-	-	-	782	722	-	640	566	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.1	0.53	15.14	10.69
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	434	23	-	-	118	-	-	637
HCM Lane V/C Ratio	0.184	0.004	-	-	0.01	-	-	0.006
HCM Ctrl Dly (s/v)	15.1	7.6	0	-	8.1	0	-	10.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	21	128	0	0	187	85	0	0	0	113	0	76
Future Vol, veh/h	21	128	0	0	187	85	0	0	0	113	0	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	10	10	10	6	6	6	0	0	0	12	12	12
Mvmt Flow	25	151	0	0	220	100	0	0	0	133	0	89

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	320	0	0	151	0	0	420	520	151	470	470	270
Stage 1	-	-	-	-	-	-	200	200	-	270	270	-
Stage 2	-	-	-	-	-	-	220	320	-	200	200	-
Critical Hdwy	4.2	-	-	4.16	-	-	7.1	6.5	6.2	7.22	6.62	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Follow-up Hdwy	2.29	-	-	2.254	-	-	3.5	4	3.3	3.608	4.108	3.408
Pot Cap-1 Maneuver	1196	-	-	1406	-	-	547	463	901	487	477	745
Stage 1	-	-	-	-	-	-	806	739	-	714	668	-
Stage 2	-	-	-	-	-	-	787	656	-	779	717	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1196	-	-	1406	-	-	471	453	901	476	466	745
Mov Cap-2 Maneuver	-	-	-	-	-	-	471	453	-	476	466	-
Stage 1	-	-	-	-	-	-	788	723	-	714	668	-
Stage 2	-	-	-	-	-	-	693	656	-	762	701	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.14	0	0	15.68
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	254	-	-	1406	-	-	557
HCM Lane V/C Ratio	-	0.021	-	-	-	-	-	0.399
HCM Ctrl Dly (s/v)	0	8.1	0	-	0	-	-	15.7
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	1.9

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	129	476	165	200	455	97
Future Volume (veh/h)	129	476	165	200	455	97
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1856	1856
Adj Flow Rate, veh/h	142	235	181	220	500	45
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	7	7	7	7	3	3
Cap, veh/h	365	325	447	1011	637	540
Arrive On Green	0.21	0.21	0.11	0.56	0.34	0.34
Sat Flow, veh/h	1711	1522	1711	1796	1856	1572
Grp Volume(v), veh/h	142	235	181	220	500	45
Grp Sat Flow(s),veh/h/ln	1711	1522	1711	1796	1856	1572
Q Serve(g_s), s	2.9	5.8	2.4	2.5	9.7	0.8
Cycle Q Clear(g_c), s	2.9	5.8	2.4	2.5	9.7	0.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	365	325	447	1011	637	540
V/C Ratio(X)	0.39	0.72	0.41	0.22	0.79	0.08
Avail Cap(c_a), veh/h	829	738	539	1406	945	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	14.7	7.8	4.4	11.9	8.9
Incr Delay (d2), s/veh	0.7	3.0	0.6	0.1	2.6	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.5	0.4	3.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	14.2	17.8	8.4	4.5	14.5	9.0
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	377			401	545	
Approach Delay, s/veh	16.4			6.3	14.1	
Approach LOS	B			A	B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	27.1	13.1	8.8	18.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	19.5	6.5	20.5
Max Q Clear Time (g_c+I1), s	4.5	7.8	4.4	11.7
Green Ext Time (p_c), s	1.2	0.9	0.1	2.1

Intersection Summary	
HCM 7th Control Delay, s/veh	12.4
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	329	0	0	552	1	1
Future Vol, veh/h	329	0	0	552	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	11	11	3	3	2	2
Mvmt Flow	362	0	0	607	1	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	362	0	968	362
Stage 1	-	-	-	-	362	-
Stage 2	-	-	-	-	607	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1192	-	282	683
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	544	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1192	-	282	683
Mov Cap-2 Maneuver	-	-	-	-	282	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	544	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	14.08
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	399	-	-	1192	-
HCM Lane V/C Ratio	0.006	-	-	-	-
HCM Ctrl Dly (s/v)	14.1	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	171	149	46	249	0	108	0	39	1	1	3
Future Vol, veh/h	0	171	149	46	249	0	108	0	39	1	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	10	10	10	8	8	8	8	8	8	0	0	0
Mvmt Flow	0	241	210	65	351	0	152	0	55	1	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	351	0	0	451	0	0	827	826	346	721	931	351
Stage 1	-	-	-	-	-	-	346	346	-	480	480	-
Stage 2	-	-	-	-	-	-	481	480	-	241	451	-
Critical Hdwy	4.2	-	-	4.18	-	-	7.18	6.58	6.28	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.272	-	-	3.572	4.072	3.372	3.5	4	3.3
Pot Cap-1 Maneuver	1165	-	-	1079	-	-	284	301	684	345	269	697
Stage 1	-	-	-	-	-	-	658	625	-	571	558	-
Stage 2	-	-	-	-	-	-	555	544	-	767	575	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1165	-	-	1079	-	-	260	278	684	294	249	697
Mov Cap-2 Maneuver	-	-	-	-	-	-	260	278	-	294	249	-
Stage 1	-	-	-	-	-	-	658	625	-	528	516	-
Stage 2	-	-	-	-	-	-	509	504	-	705	575	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.33	36.89	13.58
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	311	1165	-	-	281	-	-	426
HCM Lane V/C Ratio	0.666	-	-	-	0.06	-	-	0.017
HCM Ctrl Dly (s/v)	36.9	0	-	-	8.6	0	-	13.6
HCM Lane LOS	E	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	4.5	0	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	87	284	0	0	171	115	0	0	0	110	0	58
Future Vol, veh/h	87	284	0	0	171	115	0	0	0	110	0	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	3	3	3	5	5	5	0	0	0	6	6	6
Mvmt Flow	89	290	0	0	174	117	0	0	0	112	0	59

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	290	0	0	642	759	290	701	701	233
Stage 1	-	-	-	-	-	-	467	467	-	233	233	-
Stage 2	-	-	-	-	-	-	174	292	-	467	467	-
Critical Hdwy	4.13	-	-	4.15	-	-	7.1	6.5	6.2	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Follow-up Hdwy	2.227	-	-	2.245	-	-	3.5	4	3.3	3.554	4.054	3.354
Pot Cap-1 Maneuver	1264	-	-	1255	-	-	390	338	754	348	358	796
Stage 1	-	-	-	-	-	-	580	565	-	761	704	-
Stage 2	-	-	-	-	-	-	832	675	-	568	555	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1264	-	-	1255	-	-	331	310	754	319	328	796
Mov Cap-2 Maneuver	-	-	-	-	-	-	331	310	-	319	328	-
Stage 1	-	-	-	-	-	-	531	518	-	761	704	-
Stage 2	-	-	-	-	-	-	770	675	-	521	508	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.89	0	0	20.42
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	422	-	-	1255	-	-	402
HCM Lane V/C Ratio	-	0.07	-	-	-	-	-	0.426
HCM Ctrl Dly (s/v)	0	8.1	0	-	0	-	-	20.4
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	2.1

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	144	250	380	538	346	120
Future Volume (veh/h)	144	250	380	538	346	120
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1856	1856
Adj Flow Rate, veh/h	160	57	422	598	384	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	3	3
Cap, veh/h	243	216	661	1151	528	438
Arrive On Green	0.14	0.14	0.21	0.62	0.28	0.28
Sat Flow, veh/h	1781	1585	1781	1870	1856	1539
Grp Volume(v), veh/h	160	57	422	598	384	40
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1856	1539
Q Serve(g_s), s	3.1	1.2	5.1	6.5	6.8	0.7
Cycle Q Clear(g_c), s	3.1	1.2	5.1	6.5	6.8	0.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	243	216	661	1151	528	438
V/C Ratio(X)	0.66	0.26	0.64	0.52	0.73	0.09
Avail Cap(c_a), veh/h	885	788	810	1704	922	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.8	14.0	6.6	3.9	11.7	9.5
Incr Delay (d2), s/veh	3.0	0.6	1.2	0.4	1.9	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.9	0.6	2.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	17.9	14.7	7.8	4.3	13.6	9.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	217			1020	424	
Approach Delay, s/veh	17.0			5.7	13.2	
Approach LOS	B			A	B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	26.8	9.4	12.0	14.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	33.0	18.0	10.5	18.0
Max Q Clear Time (g_c+I1), s	8.5	5.1	7.1	8.8
Green Ext Time (p_c), s	3.8	0.5	0.5	1.6

Intersection Summary	
HCM 7th Control Delay, s/veh	9.1
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	682	1	1	465	1	0
Future Vol, veh/h	682	1	1	465	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	758	1	1	517	1	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	759	0	1277	758
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	519	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	848	-	184	407
Stage 1	-	-	-	-	463	-
Stage 2	-	-	-	-	597	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	848	-	183	407
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	463	-
Stage 2	-	-	-	-	596	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.02	24.76
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	183	-	-	4	-
HCM Lane V/C Ratio	0.006	-	-	0.001	-
HCM Ctrl Dly (s/v)	24.8	-	-	9.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	363	125	12	238	0	135	1	5	0	1	3
Future Vol, veh/h	5	363	125	12	238	0	135	1	5	0	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	4	4	4	6	6	6	25	25	25
Mvmt Flow	5	367	126	12	240	0	136	1	5	0	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	240	0	0	493	0	0	705	705	430	642	768	240
Stage 1	-	-	-	-	-	-	440	440	-	265	265	-
Stage 2	-	-	-	-	-	-	265	265	-	377	503	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.16	6.56	6.26	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Follow-up Hdwy	2.218	-	-	2.236	-	-	3.554	4.054	3.354	3.725	4.225	3.525
Pot Cap-1 Maneuver	1326	-	-	1060	-	-	346	356	617	357	306	745
Stage 1	-	-	-	-	-	-	588	571	-	693	650	-
Stage 2	-	-	-	-	-	-	731	682	-	600	505	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1326	-	-	1060	-	-	337	350	617	346	301	745
Mov Cap-2 Maneuver	-	-	-	-	-	-	337	350	-	346	301	-
Stage 1	-	-	-	-	-	-	585	568	-	684	641	-
Stage 2	-	-	-	-	-	-	718	673	-	591	502	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.08	0.4	22.78	11.67
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	343	17	-	-	86	-	-	544
HCM Lane V/C Ratio	0.416	0.004	-	-	0.011	-	-	0.007
HCM Ctrl Dly (s/v)	22.8	7.7	0	-	8.4	0	-	11.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	40	165	0	0	233	96	0	0	0	131	0	108
Future Vol, veh/h	40	165	0	0	233	96	0	0	0	131	0	108
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	10	10	10	6	6	6	0	0	0	12	12	12
Mvmt Flow	47	194	0	0	274	113	0	0	0	154	0	127

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	387	0	0	194	0	0	562	675	194	619	619	331
Stage 1	-	-	-	-	-	-	288	288	-	331	331	-
Stage 2	-	-	-	-	-	-	274	387	-	288	288	-
Critical Hdwy	4.2	-	-	4.16	-	-	7.1	6.5	6.2	7.22	6.62	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Follow-up Hdwy	2.29	-	-	2.254	-	-	3.5	4	3.3	3.608	4.108	3.408
Pot Cap-1 Maneuver	1129	-	-	1355	-	-	440	378	852	387	392	689
Stage 1	-	-	-	-	-	-	724	677	-	662	628	-
Stage 2	-	-	-	-	-	-	736	613	-	698	656	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1129	-	-	1355	-	-	342	360	852	369	373	689
Mov Cap-2 Maneuver	-	-	-	-	-	-	342	360	-	369	373	-
Stage 1	-	-	-	-	-	-	690	646	-	662	628	-
Stage 2	-	-	-	-	-	-	600	613	-	666	625	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.62	0	0	23.71
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	351	-	-	1355	-	-	467
HCM Lane V/C Ratio	-	0.042	-	-	-	-	-	0.602
HCM Ctrl Dly (s/v)	0	8.3	0	-	0	-	-	23.7
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	3.9

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	130	476	165	203	465	101
Future Volume (veh/h)	130	476	165	203	465	101
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1856	1856
Adj Flow Rate, veh/h	143	245	181	223	511	47
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	7	7	7	7	3	3
Cap, veh/h	374	333	438	1013	647	549
Arrive On Green	0.22	0.22	0.11	0.56	0.35	0.35
Sat Flow, veh/h	1711	1522	1711	1796	1856	1572
Grp Volume(v), veh/h	143	245	181	223	511	47
Grp Sat Flow(s),veh/h/ln	1711	1522	1711	1796	1856	1572
Q Serve(g_s), s	2.9	6.2	2.4	2.6	10.2	0.8
Cycle Q Clear(g_c), s	2.9	6.2	2.4	2.6	10.2	0.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	374	333	438	1013	647	549
V/C Ratio(X)	0.38	0.74	0.41	0.22	0.79	0.09
Avail Cap(c_a), veh/h	783	696	510	1396	966	818
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.8	15.0	8.0	4.5	12.1	9.0
Incr Delay (d2), s/veh	0.6	3.2	0.6	0.1	2.7	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.5	0.5	3.4	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	14.4	18.2	8.6	4.6	14.7	9.1
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	388			404	558	
Approach Delay, s/veh	16.8			6.4	14.3	
Approach LOS	B			A	B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	27.8	13.5	8.9	18.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	32.1	18.9	6.1	21.5
Max Q Clear Time (g_c+I1), s	4.6	8.2	4.4	12.2
Green Ext Time (p_c), s	1.2	0.9	0.1	2.2

Intersection Summary	
HCM 7th Control Delay, s/veh	12.6
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	329	4	3	552	15	6
Future Vol, veh/h	329	4	3	552	15	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	11	11	3	3	2	2
Mvmt Flow	362	4	3	607	16	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	366	0	977	364
Stage 1	-	-	-	-	364	-
Stage 2	-	-	-	-	613	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1187	-	278	681
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	540	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1187	-	277	681
Mov Cap-2 Maneuver	-	-	-	-	277	-
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	538	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.04	16.59
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	334	-	-	10	-
HCM Lane V/C Ratio	0.069	-	-	0.003	-
HCM Ctrl Dly (s/v)	16.6	-	-	8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	173	152	46	251	0	109	0	39	1	1	3
Future Vol, veh/h	0	173	152	46	251	0	109	0	39	1	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	10	10	10	8	8	8	8	8	8	0	0	0
Mvmt Flow	0	244	214	65	354	0	154	0	55	1	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	354	0	0	458	0	0	835	834	351	727	941	354
Stage 1	-	-	-	-	-	-	351	351	-	483	483	-
Stage 2	-	-	-	-	-	-	484	483	-	244	458	-
Critical Hdwy	4.2	-	-	4.18	-	-	7.18	6.58	6.28	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.272	-	-	3.572	4.072	3.372	3.5	4	3.3
Pot Cap-1 Maneuver	1162	-	-	1072	-	-	281	297	679	342	265	695
Stage 1	-	-	-	-	-	-	654	622	-	569	556	-
Stage 2	-	-	-	-	-	-	553	543	-	764	571	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1162	-	-	1072	-	-	257	275	679	291	245	695
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	275	-	291	245	-
Stage 1	-	-	-	-	-	-	654	622	-	526	514	-
Stage 2	-	-	-	-	-	-	507	502	-	703	571	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.33	38.35	13.66
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	307	1162	-	-	279	-	-	423
HCM Lane V/C Ratio	0.679	-	-	-	0.06	-	-	0.017
HCM Ctrl Dly (s/v)	38.3	0	-	-	8.6	0	-	13.7
HCM Lane LOS	E	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	4.6	0	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	88	285	0	0	172	115	0	0	0	110	0	59
Future Vol, veh/h	88	285	0	0	172	115	0	0	0	110	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	3	3	3	5	5	5	0	0	0	6	6	6
Mvmt Flow	90	291	0	0	176	117	0	0	0	112	0	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	293	0	0	291	0	0	646	763	291	705	705	234
Stage 1	-	-	-	-	-	-	470	470	-	234	234	-
Stage 2	-	-	-	-	-	-	176	293	-	470	470	-
Critical Hdwy	4.13	-	-	4.15	-	-	7.1	6.5	6.2	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Follow-up Hdwy	2.227	-	-	2.245	-	-	3.5	4	3.3	3.554	4.054	3.354
Pot Cap-1 Maneuver	1263	-	-	1254	-	-	387	336	753	346	356	795
Stage 1	-	-	-	-	-	-	578	563	-	760	704	-
Stage 2	-	-	-	-	-	-	831	674	-	566	553	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1263	-	-	1254	-	-	328	308	753	317	326	795
Mov Cap-2 Maneuver	-	-	-	-	-	-	328	308	-	317	326	-
Stage 1	-	-	-	-	-	-	529	515	-	760	704	-
Stage 2	-	-	-	-	-	-	768	674	-	518	506	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.9	0	0	20.58
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	425	-	-	1254	-	-	401
HCM Lane V/C Ratio	-	0.071	-	-	-	-	-	0.43
HCM Ctrl Dly (s/v)	0	8.1	0	-	0	-	-	20.6
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	2.1

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	148	250	380	549	352	123
Future Volume (veh/h)	148	250	380	549	352	123
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1856	1856
Adj Flow Rate, veh/h	164	57	422	610	391	41
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	3	3
Cap, veh/h	247	220	655	1151	534	443
Arrive On Green	0.14	0.14	0.21	0.62	0.29	0.29
Sat Flow, veh/h	1781	1585	1781	1870	1856	1539
Grp Volume(v), veh/h	164	57	422	610	391	41
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1856	1539
Q Serve(g_s), s	3.2	1.2	5.1	6.8	7.0	0.7
Cycle Q Clear(g_c), s	3.2	1.2	5.1	6.8	7.0	0.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	247	220	655	1151	534	443
V/C Ratio(X)	0.66	0.26	0.64	0.53	0.73	0.09
Avail Cap(c_a), veh/h	875	779	800	1685	912	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.0	14.1	6.7	4.0	11.8	9.6
Incr Delay (d2), s/veh	3.0	0.6	1.3	0.4	2.0	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.9	0.6	2.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	18.0	14.7	7.9	4.4	13.7	9.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	221			1032	432	
Approach Delay, s/veh	17.2			5.8	13.4	
Approach LOS	B			A	B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				27.1		9.6	12.0	15.0
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				33.0		18.0	10.5	18.0
Max Q Clear Time (g_c+I1), s				8.8		5.2	7.1	9.0
Green Ext Time (p_c), s				3.9		0.5	0.5	1.6

Intersection Summary	
HCM 7th Control Delay, s/veh	9.3
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	682	16	8	465	10	4
Future Vol, veh/h	682	16	8	465	10	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	758	18	9	517	11	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	776	0	1301	767
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	534	-
Critical Hdwy	-	-	4.13	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.227	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	836	-	178	402
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	588	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	836	-	175	402
Mov Cap-2 Maneuver	-	-	-	-	175	-
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	579	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.16	23.64
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	209	-	-	30	-
HCM Lane V/C Ratio	0.075	-	-	0.011	-
HCM Ctrl Dly (s/v)	23.6	-	-	9.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	365	127	12	242	0	138	1	5	0	1	3
Future Vol, veh/h	5	365	127	12	242	0	138	1	5	0	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	4	4	4	6	6	6	25	25	25
Mvmt Flow	5	369	128	12	244	0	139	1	5	0	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	244	0	0	497	0	0	712	712	433	648	776	244
Stage 1	-	-	-	-	-	-	443	443	-	269	269	-
Stage 2	-	-	-	-	-	-	269	269	-	379	507	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.16	6.56	6.26	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Follow-up Hdwy	2.218	-	-	2.236	-	-	3.554	4.054	3.354	3.725	4.225	3.525
Pot Cap-1 Maneuver	1322	-	-	1057	-	-	342	353	614	353	303	741
Stage 1	-	-	-	-	-	-	586	569	-	689	647	-
Stage 2	-	-	-	-	-	-	728	680	-	598	503	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1322	-	-	1057	-	-	333	346	614	343	297	741
Mov Cap-2 Maneuver	-	-	-	-	-	-	333	346	-	343	297	-
Stage 1	-	-	-	-	-	-	583	566	-	680	638	-
Stage 2	-	-	-	-	-	-	714	671	-	589	500	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.08	0.4	23.39	11.72
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	339	17	-	-	85	-	-	540
HCM Lane V/C Ratio	0.429	0.004	-	-	0.011	-	-	0.007
HCM Ctrl Dly (s/v)	23.4	7.7	0	-	8.4	0	-	11.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	166	0	0	235	96	0	0	0	131	0	110
Future Vol, veh/h	41	166	0	0	235	96	0	0	0	131	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	10	10	10	6	6	6	0	0	0	12	12	12
Mvmt Flow	48	195	0	0	276	113	0	0	0	154	0	129

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	389	0	0	195	0	0	568	681	195	625	625	333
Stage 1	-	-	-	-	-	-	292	292	-	333	333	-
Stage 2	-	-	-	-	-	-	276	389	-	292	292	-
Critical Hdwy	4.2	-	-	4.16	-	-	7.1	6.5	6.2	7.22	6.62	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Follow-up Hdwy	2.29	-	-	2.254	-	-	3.5	4	3.3	3.608	4.108	3.408
Pot Cap-1 Maneuver	1127	-	-	1354	-	-	436	375	851	384	389	686
Stage 1	-	-	-	-	-	-	721	675	-	660	626	-
Stage 2	-	-	-	-	-	-	734	612	-	695	653	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1127	-	-	1354	-	-	337	357	851	365	370	686
Mov Cap-2 Maneuver	-	-	-	-	-	-	337	357	-	365	370	-
Stage 1	-	-	-	-	-	-	686	642	-	660	626	-
Stage 2	-	-	-	-	-	-	596	612	-	662	622	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.65	0	0	24.17
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	357	-	-	1354	-	-	464
HCM Lane V/C Ratio	-	0.043	-	-	-	-	-	0.611
HCM Ctrl Dly (s/v)	0	8.3	0	-	0	-	-	24.2
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	4

Queuing and Blocking Report
2025 Existing Conditions - AM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	89	165	105	83	184	62
Average Queue (ft)	36	78	46	32	89	22
95th Queue (ft)	72	137	85	68	155	50
Link Distance (ft)	627	627	636	636	1260	1260
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Site Access & NE 28th Street

Movement	NB
Directions Served	LR
Maximum Queue (ft)	19
Average Queue (ft)	1
95th Queue (ft)	9
Link Distance (ft)	662
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	16	80	96	31
Average Queue (ft)	1	13	38	6
95th Queue (ft)	11	51	72	27
Link Distance (ft)	1506	2563	694	478
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2025 Existing Conditions - AM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	62	4	97
Average Queue (ft)	16	0	44
95th Queue (ft)	49	3	76
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2025 Existing Conditions - PM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	84	98	145	123	155	63
Average Queue (ft)	34	40	66	49	67	27
95th Queue (ft)	67	73	113	94	126	56
Link Distance (ft)	627	627	636	636	1260	1260
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Site Access & NE 28th Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	11	16
Average Queue (ft)	0	1
95th Queue (ft)	6	7
Link Distance (ft)	1320	662
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	22	44	79	46
Average Queue (ft)	1	4	34	4
95th Queue (ft)	10	24	61	25
Link Distance (ft)	1506	2563	694	478
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	63	113
Average Queue (ft)	7	52
95th Queue (ft)	35	88
Link Distance (ft)	2563	567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2027 Background Conditions - AM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	138	293	140	107	304	71
Average Queue (ft)	52	137	66	44	158	29
95th Queue (ft)	103	239	113	88	261	60
Link Distance (ft)	627	627	636	636	1260	1260
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Site Access & NE 28th Street

Movement	NB
Directions Served	LR
Maximum Queue (ft)	16
Average Queue (ft)	1
95th Queue (ft)	8
Link Distance (ft)	662
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	4	99	160	31
Average Queue (ft)	0	19	51	5
95th Queue (ft)	4	59	103	24
Link Distance (ft)	1506	2563	694	478
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2027 Background Conditions - AM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	126	9	126
Average Queue (ft)	29	0	53
95th Queue (ft)	80	4	96
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2027 Background Conditions - PM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	133	119	216	190	216	77
Average Queue (ft)	59	55	105	80	108	38
95th Queue (ft)	107	96	178	151	180	69
Link Distance (ft)	627	627	636	636	1260	1260
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Site Access & NE 28th Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	40	14
Average Queue (ft)	1	1
95th Queue (ft)	15	6
Link Distance (ft)	1320	662
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	21	56	132	53
Average Queue (ft)	1	5	53	6
95th Queue (ft)	12	28	98	31
Link Distance (ft)	1506	2563	694	478
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2027 Background Conditions - PM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	88	11	154
Average Queue (ft)	18	0	69
95th Queue (ft)	59	7	122
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2027 Buildout Conditions - AM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	117	277	124	121	283	63
Average Queue (ft)	51	132	63	47	145	28
95th Queue (ft)	100	228	108	99	241	54
Link Distance (ft)	627	627	636	636	1260	1260
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Site Access & NE 28th Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	22	44
Average Queue (ft)	1	11
95th Queue (ft)	11	30
Link Distance (ft)	1320	662
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	8	80	150	31
Average Queue (ft)	0	18	55	5
95th Queue (ft)	6	60	109	23
Link Distance (ft)	1506	2563	694	478
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2027 Buildout Conditions - AM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	72	4	146
Average Queue (ft)	23	0	53
95th Queue (ft)	61	3	109
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2027 Buildout Conditions - PM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	130	123	210	173	208	88
Average Queue (ft)	58	57	103	79	112	37
95th Queue (ft)	105	101	175	144	181	69
Link Distance (ft)	627	627	636	636	1260	1260
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: Site Access & NE 28th Street

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	66	30
Average Queue (ft)	5	8
95th Queue (ft)	30	25
Link Distance (ft)	1320	662
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	38	45	110	45
Average Queue (ft)	2	4	51	5
95th Queue (ft)	20	24	88	25
Link Distance (ft)	1506	2563	694	478
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	65	10	168
Average Queue (ft)	13	0	70
95th Queue (ft)	47	7	127
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

TRUE NORTH
GEOTECHNICAL

Pacific Lifestyle Homes
Geotechnical Engineering Evaluation

Reserve at Green Mountain (Formerly Bahu Property)
2625 NE Goodwin Road
Camas, Washington

True North Project No. 24-0368-2

April 2025 (revised May 2025)

April 18, 2025 (revised May 22, 2025)

Pacific Lifestyle Homes (PLH)
11815 NE 99th Street, Suite 1200
Vancouver, WA 98682
Attn: Nick Edwards
Email: nicke@buildplh.com

Subject: Geotechnical Engineering Evaluation
Reserve at Green Mountain Subdivision (Formerly Bahu Property)
2625 NE Goodwin Road
Camas, Clark County, Washington
Clark County Parcel No. 173192000
True North Project # 24-0368-2

True North Geotechnical Services (True North) is pleased to submit our finalized Geotechnical Engineering Evaluation for the project noted above. This report was prepared in accordance with "True North Geotechnical - General Services Agreement (GSA) P24-0368-2" dated March 18, 2025, which was authorized by Samantha Zimmer with PLH on March 20, 2025. This report is intended to build off our conclusions summarized in our previously issued report, "Preliminary Geotechnical Engineering Evaluation – Goodwin Road (Bahu)", dated December 3, 2024. This report summarizes the entirety of our work accomplished and provides our geotechnical recommendations for development of the property with the proposed Reserve at Green Mountain development.

PROJECT UNDERSTANDING

Our current understanding of the project is based on the information provided to True North by Pacific Lifestyle Homes (PLH) and their project civil engineer, PLS Engineering. We have been provided the following document related to the proposed project:

- **A one-page drawing, titled "Reserve at Green Mountain PRD", undated, prepared by PLS Engineering**. This pre-application drawing shows the proposed layout of the development, including 49 single-family lots, a network of 2-lane local streets, and the proposed stormwater facility. The proposed development is overlain on the site's existing conditions and includes a wetland buffer for the mapped potential wetland in the southern quarter of the site.

Briefly, we understand that the subdivision will be developed with 49 single-family residential lots with concrete driveways. The remainder of the property will be developed with asphalt paved roads, associated utilities, landscape/hardscape, and stormwater infiltration facilities. The south of the site includes proposed recreational open space, including passive areas (wetland and buffer), and active open space for public recreation.

We understand this project is in the preliminary planning stages. As such, we have not been provided any structural drawings or foundation loads other than an indication that the single-family residences will be 1- or 2-story buildings. Preliminarily, we have assumed that maximum building loads will on the order of be 4 kips per linear foot for continuous wall footings, 25 kips per isolated column footing, and 150 psf for floor slabs on grade. As the site is generally flat, or gently sloped, we anticipate cuts and fills no greater than 2 to 4 feet, with the exception of utility trenches, and assuming the proposed new residences are not planned to have basements. Finally, we have assumed that the proposed development will be constructed in accordance with the provisions of the 2021 International Building Code (IBC) as well as any jurisdictional code requirements.

SCOPE OF SERVICES

The purpose of our services was to explore the site surface and subsurface conditions in order to provide geotechnical recommendations for the proposed development. The following describes our specific scope of services:

- **Geologic Map Review**: We reviewed relevant available geologic maps of the site for information regarding geologic conditions and hazards at or near the site.
- **Subsurface Explorations**: We excavated a total of 9 test pits (TP-1 through TP-9) to depths ranging between 4.5 and 11 feet below existing ground surface (bgs) across the proposed development area, at the locations shown on Figure 2. Soil samples were collected from the major strata encountered in each test pit.
- **Infiltration Testing:** Infiltration testing was attempted, but due to shallow groundwater and unsuitable soils, could not be performed.
- **Laboratory Testing:** All samples were returned to our office and select samples were subjected to additional laboratory testing, that included: in-situ moisture content and fines content testing.
- **Engineering Analyses:** All data collected during the subsurface exploration, literature research, and laboratory testing was evaluated and used to develop geotechnical design and construction recommendations.
- **Geotechnical Engineering Evaluation:** This document summarizes our geotechnical engineering evaluation services, and includes:
  - A site vicinity map and site plan showing the approximate locations of our explorations.
  - A discussion of subsurface conditions encountered including pertinent soil and rock properties as well as the encountered groundwater conditions.
  - Geotechnical related recommendations for foundation design including allowable bearing capacity and estimated settlements.
  - Seismic design parameters in accordance with ASCE 7-16.
  - The results of our infiltration testing.
  - Structural fill recommendations, including an evaluation of whether the in-situ soils can be used as structural fill.
  - Floor slab support recommendations.

- General retaining wall design parameter recommendations, including earth pressures, backfill, and drainage.
- Flexible and rigid pavement design recommendations.
- General comments regarding site grading and drainage.
- Discussions on other geotechnical issues that may impact the project.

SITE CONDITIONS

Surface Description

The proposed development is an 11.67-acre lot, located at 2625 NE Goodwin Road, Camas, Clark County, Washington; Clark County Parcel # 173192000. The site is bound to the north by NE Goodwin Road and to the east and west by similarly rural single-family residences. The parcel to the south is maintained as an open park space by Clark County Parks.

The current development at the site consists of one single-family residence and attached garage, two outbuildings, a concrete well house, a paved driveway, and all utilities associated with the residence (including a septic tank to the east of the existing residence and a power vault to the north of the residence). It is our understanding that the single-family residence will remain while the existing outbuildings, well house, and driveway on site will be demolished as part of development activities.

There is significant variation in vegetation over the ground surface of the lot. The northern third of the site, abutting NE Goodwin Road, generally consists of an open pasture. Vegetation in this area consists of thick, hummocky, knee-high grasses, tall weeds, and blackberry bushes along the existing fence lines. The existing outbuildings and well house are located in the central third of the site, which is largely characterized by mature evergreen trees, significant stands of blackberry bushes (especially around the southern outbuilding, well house, and along the east and west property lines), and maintained lawn along the existing driveway. The existing residence is located in the southern third of the site, which is largely made up of a field of maintained, low grass transitioning to wetland vegetation in the southwest and southern extents of the site.

In terms of topography, the northeastern corner of the property is located at 234 feet AMSL (above median sea level), and the site descends at a gentle 0 to 10 percent gradient to the southwestern corner of the property, which is located at 196 feet AMSL. Within the proposed development area, the ground surface is locally flatter and approximately terraced, with an approximate 0 to 5 percent gradient descending to the south. The existing residence sits at the southern extent of this terrace, and south of the existing residence, the local slopes are slightly steeper as they descend into the wetland and proposed open space, with a 5 to 10 percent gradient.

Geologic Setting

The map area lies on the eastern margin of the Portland Basin, which is part of the Puget-Willamette Lowland that separates the Cascade Range from the Oregon Coast Range. Since late Eocene time,

the Cascade Range has been the locus of an episodically active volcanic arc associated with underthrusting of oceanic lithosphere beneath the North American continent along the Cascadia Subduction Zone.

The underlying geologic unit at the subject property is mapped by the Washington Geologic Information Portal as “QTc – Quaternary-Tertiary continental sedimentary rocks and deposits – conglomerate with sandy and silty facies. Quaternary-Miocene pebble, cobble, and boulder gravel. Pleistocene-Pliocene gravel, sand, silt, and clay; deposits of the ancestral Columbia River.”

According to the USDA Soil Survey, there are a number of surficial soils mapped at the site.

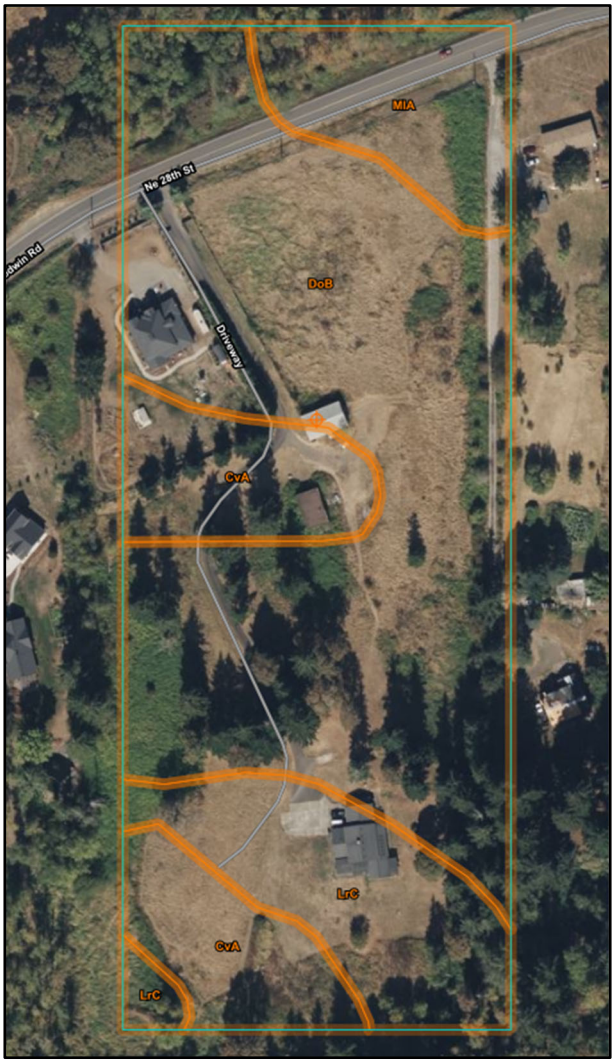


Exhibit 1: USDA mapped surficial soils at the site

In the northeastern corner of the site, surface soils are mapped as the “MIA: McBee silt loam, coarse variant, 0 to 3 percent slopes”. The McBee series consists of somewhat poorly drained soils that permeate at a moderately high to high rate. These soils formed in alluvium and are found in

depressions and drainageways. In the area of the existing outbuildings in the center of the site and in the southwestern corner of property, surface soils are mapped as “CvA: Cove silty clay loam, 0 to 3 percent slopes”. The Cove series is poorly drained, with moderately low to moderately high permeability, and are generally encountered within flood plains. Both the McBee and Cove series are characterized as hydric soils, which have shallow depths to the water table and experience regular or extended flooding or ponding.

Additional soil types mapped at the site include “DoB: Dollar loam, 0 to 5 percent slopes”, and “LrC: Lauren gravelly loam, cemented substratum, 3 to 15 percent slopes”. Both the Dollar and Lauren series are moderately well drained, with very low to high permeability.

Subsurface Conditions

On November 4, 2024, we visited the site to excavate five exploratory test pits (TP-1 through TP-5), as part of our preliminary evaluation of the site. On March 21, 2025 we returned to excavate four additional test pits (TP-6 through TP-9). In all, we excavated a total of 9 test pits to depths ranging between 4.5 and 11 feet below existing ground surface (bgs) across the proposed development area. Soil samples were collected from the major strata encountered in each test pit and were returned to our office for examination and index testing. See Figure 2 - Site & Exploration Plan for the locations of our explorations.

As indicated above, the subsurface conditions at the site are highly variable and the conditions encountered in our explorations appear consistent with the soil types indicated in regional soil maps. Descriptions of field and lab procedures and the exploration logs are included in Appendix A. The following is a highly generalized description of the subsurface units encountered:

FILL:

At the ground surface of TP-2, we encountered 2 feet of soft, silt with clay, undocumented fill, overlying 6 inches of crushed gravel. As this material will be removed as part of development activities, we did not perform any laboratory testing on this layer.

SILT:

At the ground surface in all the explorations except TP-2, we encountered dark brown to red-brown soft to medium stiff SILT with Clay and Clayey SILT. At TP-2, we first encountered this layer beneath the undocumented fill, at 2.5 feet bgs. In TP-1 and TP-2, in the northeast portion of the site, these soft to medium stiff, fine-grained soils extended to depths of 6 to 9 feet. Over the remainder of our explorations these surficial fine-grained soils extended to 1.5 to 5 feet bgs.

Laboratory tests conducted on soil samples collected from this layer returned moisture contents ranging from 21 to 32 percent, and fines contents ranging from 54 to 77 percent.

SAND:

Underlying the silt material found at TP-1, TP-4, TP-6 and TP-8, we encountered medium dense to very dense SAND with varying amounts of fines (clay and gravel). This layer extended to depths ranging between 2 and 9 feet bgs.

Laboratory testing conducted on this layer returned moisture contents ranging between 19 and 41 percent and fines contents ranging between 39 and 49 percent..

GRAVEL (WEATHERED BEDROCK):

Underlying the silt or sand material found in all test pits except TP-3 and TP-4, we encountered dense to very dense GRAVEL with varying amounts of clay, extending to the termination depth of those explorations where it was encountered explorations. This material was interpreted to be weathered bedrock at depths.

Laboratory tests conducted on soil samples collected from these layers returned moisture contents ranging from 19 to 55 percent, and a fines content of 25 percent.

As previously mentioned, the subsurface conditions at the site exhibited significant variation, consistent with the multiple mapped USDA soil types within the property. The above generalized descriptions are a rough overview of the encountered conditions. More detailed information of subsurface conditions can be found in the attached Test Pit Logs in Appendix A.

Groundwater

Groundwater was encountered at TP-1, TP-2, TP-3, TP-6, TP-8, and TP-9, at depths of 5, 8.5, 6, 3.5, 1.5, and 3 feet bgs, respectively. TP-1 and TP-6 were excavated near mapped hydric soils in the southeast corner of the site, while TP-2, TP-4, TP-8 and TP-9 were excavated in non-hydric soils. Data published on Clark County MapsOnline indicates that groundwater at the site is between 0 to 10 feet bgs, which agrees with groundwater conditions observed in our explorations.

Depending on the time of year of construction, it may be possible that groundwater could be an issue during shallow foundation construction. Additionally, utility trenches may encounter perched water and infiltration facilities will need to be located at a shallow enough depth that adequate vertical spacing is provided between the bottom of the facility and seasonal high groundwater. Groundwater elevations can fluctuate depending on the time of year of construction and changes in land use.

Infiltration Testing/Feasibility

Based on the presence of shallow groundwater at most of our explorations and the lack of suitable soils above the groundwater table for infiltration, infiltration testing could not be reliably completed at the property. It is our opinion that subsurface infiltration is not a feasible method of stormwater management at this site.

Geologic Hazards Review

The following provides a geologic hazards review for the subject site in accordance with CCC 40.430. The geologic hazard review is based on our site reconnaissance and explorations, as well as a review of publicly available published literature and maps.

Mapped Hazards: As a part of our due diligence, we reviewed the Clark County Property Information Center - MapsOnline website (https://gis.clark.wa.gov/gis/property) for information on geologic hazards present at this property. No geologic hazards are mapped on this property. The site is mapped as having an NEHRP site class C and very low liquefaction susceptibility. We address the applicable sections of CCC 40.430 below:

Liquefaction: As stated above, the area to be developed is mapped as having a very low liquefaction susceptibility. This corresponds to the conditions observed in our explorations where dense soils with a significant coarse material percentage (eg, sand, gravel, cobbles, or boulders) were encountered at relatively shallow depths ranging between 1.5 and 9 feet bgs. Dense, large-grained soils below the water table (encountered at 5 feet bgs at the shallowest) have a very low potential for liquefaction.

Ground Motion Amplification: In accordance with ASCE 7-16, we recommend a Site Class C (dense soil and soft rock soil profile with an average N-value greater than 50) for this site when considering the average of the upper 100 feet of bearing material beneath the foundations. This recommendation is based on the results of our subsurface investigation as well as our understanding of the local geology. Inputting our recommended Site Class as well as the site latitude and longitude into the ACSE 7 website (ASCE 7 Hazard Tool), we obtained the seismic design parameters shown in Table 1 below. Note that the values for F_a and F_v in Table 2 were obtained from ASCE's Supplement 3 dated November 5, 2021 and issued for ASCE 7-16 to correct some seismic design issues in the original publication.

Table 1. 2021 IBC (ASCE 7-16, Supplement 3) Seismic Design Parameters

Location	Short Period	1-Second
Maximum Credible Earthquake Spectral Acceleration	S_s = 0.797 g	S_1 = 0.351 g
Site Class	C	
Site Coefficient	F_a = 1.2	F_v= 1.5
Adjusted Spectral Acceleration	S_{MS} = 0.957 g	S_{M1} = 0.527 g*
Design Spectral Response Acceleration Parameters	S_{DS} = 0.638 g	S_{D1} = 0.351 g
MCE_G Peak Ground Acceleration	MCE_G PGA = 0.357 g	
Site Amplification Factor at PGA	F_{PGA} = 1.2	
Site Modified Peak Ground Acceleration	PGA_M = 0.429 g	

g – acceleration due to gravity, * See note below.

The return interval for the ground motions reported in the table above is 2 percent probability of exceedance in 50 years.

CONCLUSIONS AND RECOMMENDATIONS

Geotechnical Design and Construction Considerations

Based on the results of our Geotechnical Engineering Evaluation, development of the site with the proposed development is feasible provided the recommendations in this report are included in the project design and implemented during construction.

The primary geotechnical concerns associated with the project are:

1. **Presence of soft surficial soils.** As noted above, we encountered variable depths of fill and/or soft surficial soils across the site, ranging in thickness between 0.5 and 2.5 feet below existing ground surface (bgs). The fill encountered in TP-2 extended to about 2.5 feet bgs and consisted of 2 feet of soft silt with clay underlain by 6 inches of ¾" minus gravel. During mass grading we expect much of the surficial soils will be removed from the site or stockpiled for use in landscape areas. Once the subgrade has been approved by True North, mass grading may begin using suitable onsite material or imported structural/engineered fill. We expect that foundations will generally bear on properly placed and compacted structural/engineered fill.

2. **Presence of shallow groundwater and seepage.** As stated above, we encountered shallow groundwater in several of our explorations across the site, in both mapped hydric soils areas, and outside of these areas. We do not anticipate that generally groundwater will become an issue for mass grading and shallow foundation construction. However, given that groundwater was encountered at 1.5 feet bgs at TP-8, it is more likely that groundwater may present an issue during mass grading and shallow foundation construction in the north of the site, and particularly during the wet winter months.

   Additionally, utility trenches and other embedded structure excavations will likely encounter groundwater during development of the site. The contractor will need to be prepared for this condition.

   Finally, due to the presence of shallow groundwater across the site, it is our opinion that the subsurface conditions are not conducive to the use of infiltration for stormwater management for the proposed project.

In summary, provided the recommendations in this report are adhered to, we do not foresee any major issues that would preclude the proposed development. The above-mentioned factors are listed to draw the attention of the reader to the issues to address during design and construction.

Moisture Sensitive Soils/Weather Related Concerns

The fine-grained soils at this site are considered moisture sensitive. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

Given the depth of the soft surficial soils encountered across this site, the contractor may need to consider the construction of temporary haul roads depending on the time of year construction takes place. True North can provide more detailed wet weather recommendations if needed. Stormwater should not be allowed to collect on prepared subgrades.

Site Preparation

Site preparation will include clearing, grubbing, etc. to remove the upper organic and fill soils to expose the underlying, native, medium dense silty sand and/or very dense, silty gravel and cobbles. Once the stripping has been approved we recommend proofrolling the site with a fully loaded, tandem axle dump truck to identify any excessively soft spots under the observation of the Geotechnical Engineer during various phases of construction to ensure proper fill placement. Areas not able to be adequately proofrolled (or where not practical) will be evaluated by the Geotechnical Engineer using a ½-inch diameter steel probe rod. Any soft spots identified should be over excavated to expose firm and unyielding soils and replaced with compacted structural fill.

Any utilities present beneath the proposed construction will need to be located and rerouted as necessary and any abandoned pipes or utility conduits should be removed to inhibit the potential for subsurface erosion. Utility trench excavations should be backfilled with properly compacted structural fill in accordance with the structural fill recommendations in this report.

It should be noted that, due to the soft surficial soils observed over much of the site, construction traffic on these upper soils may have a difficult time moving around on site. We recommend consideration be given to constructing haul roads depending on site conditions at the time of construction.

Subgrade Verification

Following site preparation, including removal of all topsoil/till zone and compaction of the exposed subgrade and prior to placing aggregate base for the foundations, building pad, or pavement section, the exposed subgrade should be evaluated. The subgrades should be evaluated by qualified True North personnel using a steel foundation probe. Unsuitable areas identified during the field evaluation should be re-compacted to or be excavated to firm ground and replaced with structural fill.

Excavations

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document and subsequent updates were issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

Depending on the time of year, and the depth of the excavation, groundwater may be encountered at shallow depths. If groundwater is encountered during excavation, the soils encountered in our subsurface explorations should be classified as Type C soil according to the most recent OSHA regulations. If groundwater is not encountered or dewatering is accomplished in advance of excavation, the soils may be classified as Type B soil. In our opinion, excavations should be safely sloped or shored.

If groundwater is encountered during excavation, positive groundwater control will be required, including the possibility of wells extending below the depth of excavation. Groundwater levels will be lowest in the dry season, and construction during that time will minimize groundwater control problems. The groundwater conditions at the time of construction and the contractor’s ability to control these conditions will control the degree of inclination of temporary slopes. In our opinion, temporary excavation slopes can be constructed as steep as 1.5H:1V, if groundwater levels are maintained at least 2 feet below the bottom of the excavation. Slopes should be flattened if significant seepage or running soils are encountered.

If slopes of this inclination, or flatter, cannot be constructed, or if excavations greater than four feet in depth are required, temporary shoring may be necessary. This shoring would help protect against slope or excavation collapse and would provide protection to workmen in the excavation.

We are providing this information solely as a service to our client. True North does not assume responsibility for construction site safety or the contractor's compliance with local, state, and federal safety or other regulations.

Construction Dewatering

The results of our subsurface investigations indicate that the groundwater seepage at the site is located some 3 to 5 feet below the ground surface, and will fluctuate in response to seasonal precipitation. Excavations that extend below the groundwater level may result in caving, heaving, or running soils, especially if excavations extend into the sandy clay soils encountered in our explorations. The contractor should consider the use of a network of ditches and sumps, into which water can flow to be pumped out of the excavation.

The depth and dewatering time will need to be determined at the time of construction and adjusted depending on site conditions. Unprotected working should not be allowed near temporary un-shored excavations until groundwater levels have been stabilized and shoring, such as trench shields or bracing, has been installed.

Structural Fill

Structural fill should be granular, free of organics or other deleterious materials, have a maximum particle size less than 3 inches, be relatively well graded, and have a liquid limit less than 45 and plasticity index less than 25. In our professional opinion, we anticipate the surficial fine-grained soils stripped from this site may be used only in landscape areas. These soils are moisture sensitive and could be difficult (depending on time of year of construction) to properly moisture condition and place. As such, the contractor will need to account for the need to import material to raise site grades. We recommend crushed rock structural fill be placed beneath footings, slabs, or other structural elements to allow for uniform load distribution, to provide protection from the elements, and to create a clean working surface.

We recommend all structural fill be moisture conditioned to within 3 percentage points below and 2 percentage points above optimum moisture as determined by ASTM D1557 (modified proctor). If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying.

Fill should be placed in relatively uniform horizontal lifts on the prepared subgrade which has been stripped of deleterious materials (i.e. topsoil and fill) and approved by the Geotechnical Engineer or his representative. Each loose lift should be about 1-foot thick. The type of compaction equipment used will ultimately determine the maximum lift thickness. Structural fill should be compacted to at least 95 percent of modified proctor maximum dry density as determined by ASTM D1557. Each lift of compacted engineered fill should be tested by a representative of the Geotechnical Engineer prior to placement of subsequent lifts.

Utility Trench Backfill

Trench backfill for the utility pipe base and pipe zone should consist of well-graded granular material with a maximum particle size of ¾ inch and less than 8 percent by weight passing the U.S. Standard No. 200 Sieve. The material should be free of roots, organic matter, and other unsuitable materials.

Trench backfill should be compacted to at least 90 percent of the maximum dry density at depths greater than 4 feet below finished grade and to 95 percent of the maximum dry density within 4 feet of finished grade. Compaction is based on ASTM D1557/AASHTO T-180, the modified proctor test, or as recommended by the pipe manufacturer.

Foundation Recommendations

Once the site has been properly prepared as discussed above, the planned construction can be supported on a conventional shallow foundation system. All foundations should bear on native, undisturbed, medium stiff clayey silt, or, heavily recompacted, native, sandy clay, or, atop compacted granular crushed rock structural fill placed atop the approved subgrade soils. Spread footings for building columns and continuous footings for bearing walls supported on the above-mentioned materials can be designed for an allowable soil bearing pressure of 2,000 psf based on dead load plus design live load and can be increased by one-third when including short-term wind or seismic loads. The above allowable soil bearing pressures can be increased by one-third when including short-term wind or seismic loads. Construction shall be accomplished in accordance with the 2021 International Building Code (IBC).

Lateral frictional resistance between the base of footings and the subgrade can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.33 for concrete foundations bearing directly on the subgrade soils described above or on compacted structural fill placed atop that strata In addition, lateral loads may be resisted by passive earth pressures based on an equivalent fluid pressure of 250 pounds per cubic foot (pcf) for footings poured “neat” against the above-mentioned soil/rock strata. These are ultimate values—we recommend a factor of safety of 1.5 be applied to the equivalent fluid pressure, which is appropriate due to the amount of movement required to develop full passive resistance.

Exterior footings and foundations in unheated areas should be located at a depth of at least 18 inches below the final exterior grade to provide adequate frost protection. If the construction takes place during the winter months and the foundation soils will likely be subjected to freezing temperatures after foundation construction, then the foundation soils should be adequately protected from freezing. Otherwise, interior foundations can be located at nominal depths compatible with architectural and structural considerations.

The foundation excavations should be observed by a representative of the Geotechnical Engineer prior to steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Unsuitable soil zones encountered at the bottom of the foundation excavations should be removed and replaced with properly compacted structural fill as directed by the Geotechnical Engineer.

The fine-grained soils at this site are moisture sensitive. As such, they should be kept to as close to their in-situ moisture content. This should be accomplished during construction by covering the

soil subgrade the same day it is exposed with crushed rock structural fill. Surface run-off water should be drained away from the excavations and not be allowed to pond.

Based on the known subsurface conditions we anticipate that properly designed and constructed foundations supported on the above-mentioned materials could experience maximum total settlement on the order of 1-inch and differential settlement on the order of 1/2-inch over 30 horizontal feet.

Granular Pads: Granular pads should be used if unsuitable foundation conditions are encountered at the proposed foundation subgrade elevations. Granular pads should extend 6 inches horizontally beyond the margins of the footings for each foot of the pad thickness or to the depth of firm, undisturbed native soil. The granular pads should be a minimum of 6 inches thick, however if embedded structures are encountered in the foundation areas, the embedded structure should be removed down to a minimum 24-inches below the base of footing, and granular pads should be thickened accordingly.

The granular pads should consist of ¾-inch minus crushed rock that is fairly well graded between coarse and fine, contains no organic matter or other deleterious materials, and has less than 5 percent passing the U.S. Standard No. 200 Sieve. The imported crushed rock should be compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D 698.

Retaining Walls

We were not provided any construction drawings that would indicate if site retaining walls are necessary to complete the grading of the site. True North is available to provide a separate retaining wall design for any planned walls. We provide the following recommendations for use by the Structural Engineer in the event additional stem walls or other concrete structural walls are required for the homes.

The foundations for the proposed walls should be designed in accordance with foundation recommendations above. Lateral earth pressures on walls, which are not restrained at the top, may be calculated on the basis of an “active” equivalent fluid pressure of 35 pcf for level backfill, and 60 pcf for sloping backfill with a maximum 2H:1V slope. Lateral earth pressures on walls that are restrained from yielding at the top (i.e. stem walls) may be calculated on the basis of an “at-rest” equivalent fluid pressure of 55 pcf for level backfill, and 90 pcf for sloping backfill with a maximum 2H:1V slope. The stated equivalent fluid pressures do not include surcharges, such as foundation, vehicle, equipment, etc., behind walls, hydrostatic pressure buildup, or earthquake loading.
For seismic loading on retaining walls with level backfill, new research indicates that the seismic load is to be applied at 1/3 H of the wall instead of 2/3 H, where H is the height of the wall. We recommend that a Mononobe-Okabe earthquake thrust per linear foot of 4.8 psf* H^2 be applied at 1/3 H, where H is the height of the wall measured in feet. For a maximum 2H:1V slope we recommend 8.5 psf*H^2. This assumes a combination of soil and granular backfill retained by the walls within the active wedge.

All backfill for retaining walls should be select granular material, such as sand or crushed rock with a maximum particle size between ¾ and 1 ½ inches, having less than 5 percent material passing the No. 200 sieve. Because of their silt content, the native soils do not meet this requirement, and it will be necessary to import material to the project for wall backfill. Silty soils can be used for the last 18 to 24 inches of backfill, thus acting as a seal to the granular backfill. All backfill behind retaining walls should be moisture conditioned to within ± 2 percent of optimum moisture content and compacted to a minimum of 90 percent of the material's maximum dry density as determined in accordance with ASTM D1557. Fill materials should be placed in layers that, when compacted, do not exceed about 8 inches. Care in the placement and compaction of fill behind retaining walls must be taken in order to ensure that undue lateral loads are not placed on the walls. An adequate subsurface drain system will need to be designed and installed behind retaining walls to prevent hydrostatic buildup.

Slab-on-grade Floors

Support for lightly loaded floor slabs can be obtained on the undisturbed native soil or on engineered structural fill. A minimum 4-inch-thick layer of imported granular material should be placed and compacted over the prepared subgrade to assist as a capillary break and provide uniform load distribution.

A subgrade modulus of 150 pounds per cubic inch may be used to design floor slabs. Imported granular material should be crushed rock or crushed gravel and sand that is well-graded between coarse and fine, contain no deleterious materials, have a maximum particle size of 1½ inches, and have less than 5% by weight passing the U.S. Standard No. 200 Sieve. The imported granular material may be placed in one lift and should be compacted until well-keyed, about 95% of the maximum dry density as determined by ASTM D1557 (AASHTO T-180).

Pavement

The following pavement design recommendations are based on our experience with similar facilities and subgrade conditions.

For automobile parking areas, we recommend a pavement section consisting of 3 inches of asphaltic concrete (AC) over 8 inches of crushed rock base (CRB) or 5 inches of Portland Cement concrete (PCC) over 5 inches of crushed rock base (CRB). For truck traffic areas, the pavement section should consist of 4 inches of AC over 12 inches of CRB or 6 inches of PCC over 8 inches of CRB. These recommended pavement sections are based on the assumption that the subgrade consists of firm structural fill or compacted native subgrade and that the pavement will be constructed during the dry summer months. Proofrolling should be used to evaluate pavement subgrade. Any soft areas disclosed by proofrolling will likely need to be reworked. Some contingency should be provided for the repair of any soft areas. If pavement construction is scheduled for the wet season, it will be necessary to increase the above-recommended base course sections.

AC and CRB materials should conform to WSDOT specifications. All CRB should be compacted to at least 95 percent of the modified proctor ASTM D-1557 laboratory test standard.

Drainage: Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as around stormwater catch basins. Effective means to prevent saturation of the base course including installing weep holes in the sidewalls to catch basins.

Geotextile Separation Fabric: A geotextile separation fabric will be required at the interface of the native soil and imported subgrade material beneath the proposed roadways. The separation fabric should meet the specificiation provided in WSS 9-33.2(1) – Geotextile Properties (Table 3) for soil separation. The geotextile should be installed in conformance with the specifications provided in WSS 2-12 – Construction Geosynthetic.

Stabilization Material: In the case of unsuitable or unstable pavement subgrade conditions, stabilization material consisting of pit- or quarry-run rock or crushed rock should be placed below the above-described pavement sections. The material should have a maximum particle size of 6-inches and less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve, have at least two mechanically fractured faces, and be free or organic matter or other deleterious material. Material meeting the specification provided in WSS 9-27.3(6) – Stone is generally acceptable for use. Stabilization material should be placed in lifts between 12 and 18 inches thick and compacted to a firm condition with a smooth-drum roller without using vibratory action.

Drainage and Groundwater Considerations

The Contractor should be made responsible for temporary drainage of surface water and groundwater as necessary during construction to prevent standing water and/or erosion at the site.

As a matter of good construction practice, we recommend that perimeter drains be installed for all buildings. Perimeter drains should consist of perforated drainpipe embedded in a zone of free draining fill that is wrapped in a non-woven geotextile filter. The pipe should be connected to a tightline drainpipe leading to storm drain facilities. Foundation and crawl space drainage should be sloped to drain to a sump or low point drain outlet. Water should not be allowed to pond within crawl spaces. Roof drains should be connected to a tightline drainpipe leading to storm drain outlet facilities.

Water should not be allowed to collect in the foundation excavations or on prepared subgrades for the foundations/slabs/roadway during construction. Positive site drainage should be maintained throughout construction activities. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff.

The site grading plan should be developed to provide rapid drainage of surface water away from the building areas and to inhibit infiltration of surface water around the perimeter of the buildings and beneath the floor slabs. The grades should be sloped away from the building area. We anticipate stormwater will be routed to the storm system (infiltration facility) to be constructed as part of this development.

Soil Erosion

Site-specific erosion control measures should be implemented to address the maintenance of slopes or exposed areas. This may include silt fence, bio-filter bags, straw wattles, or other suitable methods. During construction, all exposed areas should be well compacted and protected from erosion. Temporary slopes or exposed areas may be covered with straw, crushed aggregate, or rip in localized areas to minimize erosion.

LIMITATIONS

This report was prepared for the exclusive use of Pacific Lifestyle Homes and members of the design team for specific application to the Goodwin Road (Bahu) Property development located at the address noted above. It should be made available to prospective contractors for information on the factual data only, and not as a warranty of subsurface conditions such as those interpreted from the explorations and presented in the discussions of the subsurface conditions included in this report.

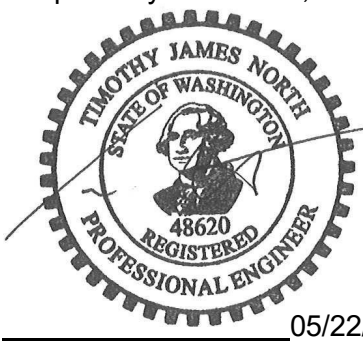
The recommendations contained in this report are based on information derived through subsurface sampling. No matter how effective subsurface sampling may be, variations between exploration location and the presence of unsuitable materials are possible and cannot be determined until exposed during construction. Accordingly, True North’s recommendations can be finalized only through True North's observation of the project's earthwork construction. True North accepts no responsibility or liability for any party's reliance on True North's recommendations.

Within the limitations of the scope, schedule and budget, the analyses, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted professional geotechnical engineering principles and practice in this area at the time this report was prepared. We make no warranty, either express or implied.

CLOSING

We appreciate the opportunity to be of service to you. If you have any questions, or if we can be of further assistance to you, please contact us at (360) 984-6584.

Respectfully Submitted,



05/22/25

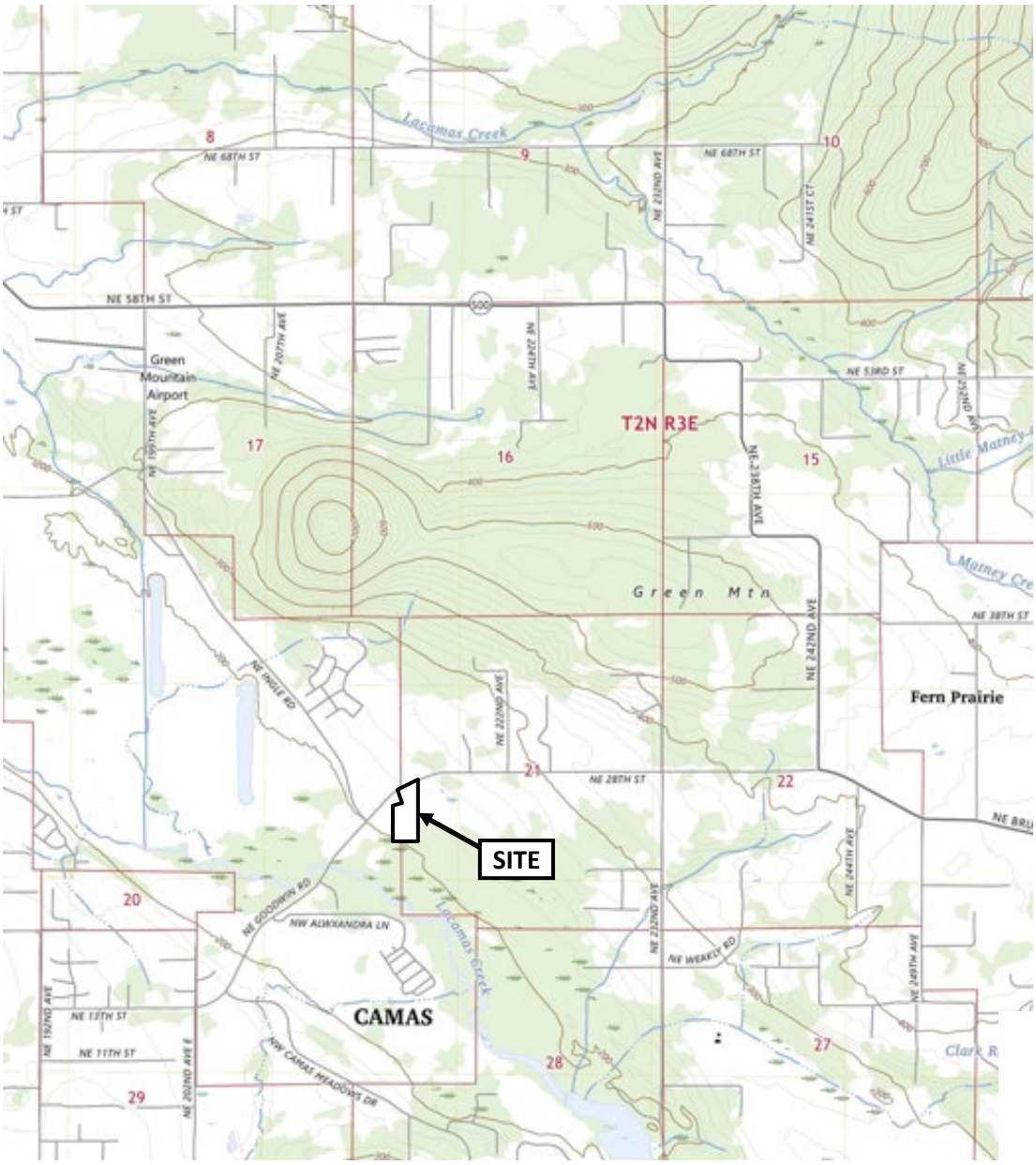
Timothy J. North, P.E.
Principal Geotechnical Engineer

Reviewed By:

Lauren Shepherd, E.I.T.
Staff Geotechnical Engineer

Attachment: Figure 1 – Site Vicinity
Figure 2 – Site Layout and Explorations
Figure 3 – Site Photographs
Appendix A – Field Exploration Methods, Lab Testing Procedures, Exploration Logs

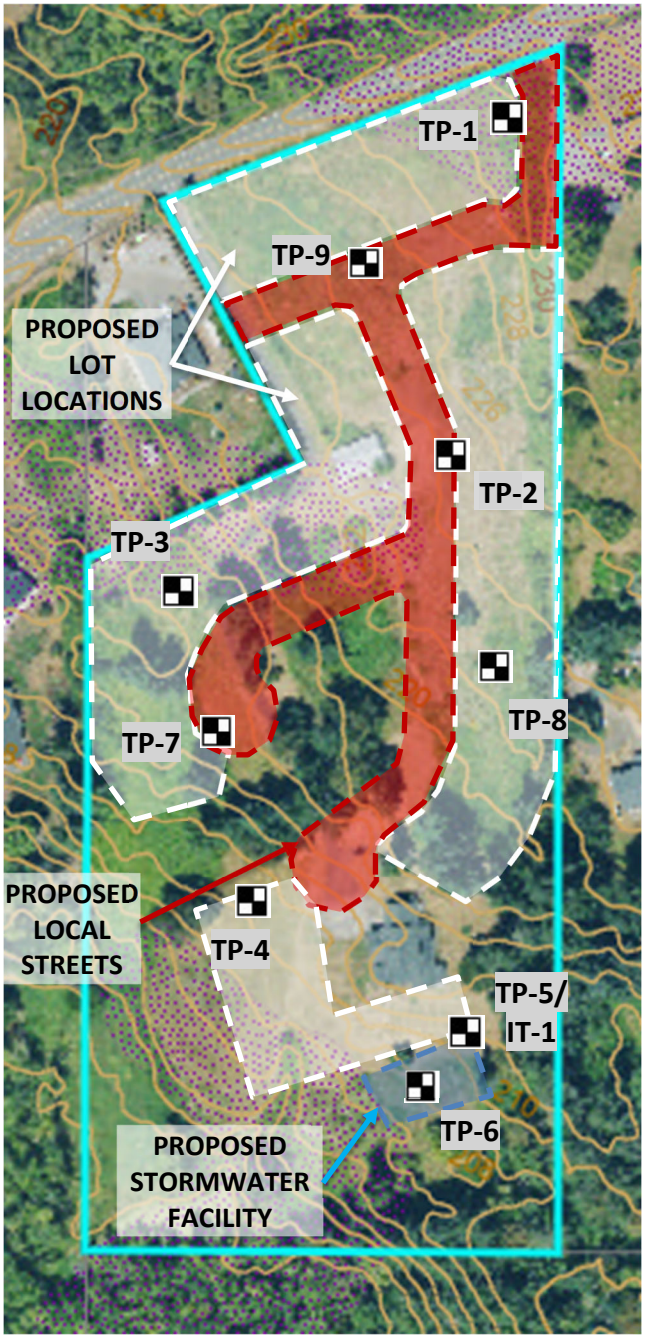
FIGURES



Not to Scale

Source: "Topographic Map of the Lacamas Creek Quadrangle, 7.5 minute series" 2023, United States Geological Survey (USGS).

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 1 – Vicinity Map



TP-1 Approximate Exploratory Test Pit Locations, November 4, 2024, and March 21, 2025.

Source: Aerial & Topo – Clark County MapsOnline, accessed November 18, 2024.
Note: Purple shading indicates mapped hydric soils.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Home Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025 (revised May 2025)	Figure 2 –Site Plan



Photo 1. From the approximate location of TP-1, looking west across the pasture.



Photo 2. From between the two outbuildings, looking north along the private driveway connecting with NE Goodwin Road.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3A – Site Photographs (1 of 5)



Photo 3. From between the existing outbuildings, looking south, towards the existing residence.



Photo 4. From approximate location of TP-3, looking east towards existing outbuildings.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3B – Site Photographs (2 of 5)



Photo 5. From approximate location of TP-4, looking southeast towards existing residence.



Photo 6. From the existing residence, looking west across gentle descending slope to proposed open recreational area.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3C – Site Photographs (3 of 5)



Photo 1. South of the existing residence, looking east, towards the location of TP-6



Photo 2. From the existing driveway, looking southwest towards the existing residence and TP-7, in progress

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3D – Site Photographs (4 of 5)



Photo 3. From north of the existing residence, looking north, towards the location of TP-8



Photo 4. From near the existing barn, looking north towards TP-9, in progress

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3E – Site Photographs (5 of 5)

APPENDIX A

Field Exploration Procedures
Laboratory Testing Procedures
Test Pit Logs

FIELD EXPLORATION PROCEDURES

General

We excavated a total of 9 test pits (TP-1 through TP-9) to depths ranging between 4.5 and 11 feet below existing ground surface (bgs) across the proposed development area. The excavations were advanced utilizing a Link-Belt 80 X3 with a 30-inch wide toothed bucket owned and operated by Thompson Brothers Excavating. Soil samples were collected from the major strata encountered in each test pit and at the bottom of each infiltration test pit location The approximate exploration locations are shown in Figure 2.

Soil Sampling

Representative grab samples of the soil observed in the explorations were obtained from the sidewalls or spoils. Samples obtained in the exploration were sealed in airtight, plastic bags to retain moisture and returned to our laboratory for additional examination and testing. The test explorations were loosely backfilled.

Pocket Penetrometer Testing

The undrained shear strength of fine-grained soil (silt and clay) was estimated with a pocket penetrometer applied to the sidewalls of the test pits. A pocket penetrometer is a hand-held device that indicates undrained compressive strength in tons per square foot. The test method is approximate and applicable only to fine-grained soil.

Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, peculiar odors, and other distinguishing characteristics of the soil samples were noted. The terminology used is described in the key and glossary that follow.

Summary Exploration Logs

Results from the explorations are shown in the summary exploration logs. The left-hand portion of a log provides our interpretation of the soil encountered, sample depths, and groundwater information. The right-hand, graphic portion of a log shows the results of pocket penetrometer and laboratory testing. Soil descriptions and interfaces between soil types shown in summary logs are interpretive, and actual transitions may be gradual.

LABORATORY TESTING PROCEDURES

Soil samples obtained during field explorations are examined in our laboratory, and representative samples may be selected for further testing.

Visual-Manual Classification

Soil samples are classified in general accordance with guidelines presented in ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The physical characteristics of the samples are noted and the field classifications are modified, where

necessary, in accordance with ASTM terminology, though certain terminology that incorporates current local engineering practice may be used. The term which best described the major portion of the sample is used to describe the soil type.'

Natural Moisture Content

Natural moisture content is determined in general accordance with guidelines presented in ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass. The natural moisture content is the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of solid particles.

Fines Content

Fines content testing is performed in general accordance with guidelines presented in ASTM D1140, *Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No.200) Sieve in Soils by Washing*. The fines content is the fraction of soil that passes the U.S. Standard Number 200 Sieve. This sieve differentiates fines (silt and clay) from sand and gravel. Soil material that remains on the Number 200 sieve is sand. Material that passes the sieve is fines. The test is used to refine soil type.

TRUE NORTH GEOTECHNICAL
219 West 4th Street, Vancouver, WA
360-984-6584 - tnorthgeo.com

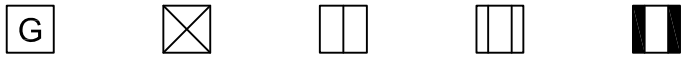
TABLE A1
Key to Test Pit and Boring Terminology and Symbols

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTION
Coarse Grained Soils: More Than 50% Material Retained on No. 200 Sieve	Gravel and Gravelly Soils: More Than 50% Coarse Fraction Retained on No. 4 Sieve	Clean Gravels (Little or No Fines)		GW	Well-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
				GP	Poorly-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		Gravels with Fines (Significant Percentage of Fines)		GM	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand and Sandy Soils: More Than 50% Coarse Fraction Passing No. 4 Sieve	Clean Sands (Little or No Fines)		SW	Well-graded Sands, Gravelly Sands, Little or No Fines
				SP	Poorly-graded Sands, Gravelly Sands, Little or No Fines
		Sands with Fines (Significant Percentage of Fines)		SM	Silty Sands, Sand-Silt Mixtures
				SC	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils: More Than 50% Material Passing No. 200 Sieve	Silts and Clays	Liquid Limit Less than 50 percent		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands, Clayey Silts
				CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays
				OL	Organic Silts and Organic Silty Clays of Low Plasticity
	Silts and Clays	Liquid Limit Greater than 50 percent		MH	Inorganic Silts Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH	Inorganic Clays of High Plasticity, Fat Clays
				OH	Organic Clays of Medium to High Plasticity, Organic Silts
				PT	Peat, Humus, Swamp Soils
Topsoil					Humus and Duff Layer
Fill					Highly Variable Constituents

Relative Density of Coarse-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50+

Consistency of Fine-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 -8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	30 - 50
Very Hard	50+

Key to Sampler Type Symbols



Grab | SPT | Shelby Tube | Dames & Moore | Rock Core

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-1

UTM	: 10T	**Excavator**	: Link-Belt	**Job Number**	: 24-0368-1
Latitude	: 45.58570	**Excavator Supplier**	: Thompson Brothers Excavating	**Client**	: Pacific Lifestyle Homes
Longitude	: -122.40267	**Logged By**	: LS	**Project**	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	**Reviewed By**	: TJN	**Location**	: Camas, Washington, USA
Total Depth	: 10 ft BGL	**Date**	: 11/04/2024	**Loc Comment**	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1	S1		ML	Soft, dark brown, SILT, some clay; rooted to 8 inches bgs; slightly moist.	32		1.0	
2							0.75	
3	S2		CL-ML	Soft to medium stiff, red brown, CLAYEY SILT, some sand; very moist.	24	70	1.5	
4							1.5	
5 ▼								
6			SM	Medium dense to dense, gray brown, POORLY GRADED SILTY SAND; wet.				
7	S3				41	49		
8								
9	S4		GP-GC	Dense, tan gray, POORLY GRADED GRAVEL AND BOULDERS, some clay; boulders up to 22 inches in diameter; wet.	55			

Groundwater encountered at 5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-2

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0368-1
Latitude	: 45.58570	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.40267	Logged By	: LS	Project	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	Reviewed By	: TJN	Location	: Camas, Washington, USA
Total Depth	: 11 ft BGL	Date	: 11/04/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1				Fill- soft to medium stiff, red brown, SILT, some clay; rooted to 8 inches bgs; moist.				
2				Fill- dense, gray, POORLY GRADED GRAVEL; moist.				
3				Soft to medium stiff, dark blue-gray to black, SILTY CLAY; moist to very moist.				
	S1				26	68	2.5	
4							1.5	
5								
6			CL-ML					
7								
8								
▼								
9								
	S2			Medium dense to dense, dark blue-gray, WELL-GRADED GRAVEL AND COBBLES WITH SAND; cobbles up to 8 inches in diameter; wet.	30			
10			GW					
	S3				39			
				Groundwater encountered at 8.5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

True North Geotechnical
219 W. 4th Street Vancouver, WA 98660
Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-3

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0368-1
Latitude	: 45.58570	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.40267	Logged By	: LS	Project	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	Reviewed By	: TJN	Location	: Camas, Washington, USA
Total Depth	: 4.5 ft BGL	Date	: 11/04/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Soft to medium stiff, dark brown, SILT, some clay; rooted to 6 inches bgs; moist.			2.0	
2				Stiff, red brown, SILTY CLAY WITH GRAVEL AND BOULDERS; with boulders up to 3 feet in diameter; moist.			1.0	
3	S1		CL-ML		15	69	2.0	
4							4.5+	
				Refusal due to practical equipment failure. No groundwater encountered. Test pit backfilled with excavated soils and tamped to grade.				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-4

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0368-1
Latitude	: 45.58570	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.40267	Logged By	: LS	Project	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	Reviewed By	: TJN	Location	: Camas, Washington, USA
Total Depth	: 6.5 ft BGL	Date	: 11/04/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1	S1		ML	Soft to medium stiff, dark brown, SILT, some clay; rooted to 6 inches bgs; moist.	24	57	1.0	
2			SC	Stiff, gray brown with red mottling, SANDY CLAY WITH GRAVEL, some cobbles; slightly moist.			1.5	
3	S2				19		4.5+	
4							4.5+	
5			SP	Medium dense, red brown, POORLY GRADED SAND, some clay; very moist.				
6 ▼	S3				37	39		

Groundwater encountered at 6 feet bgs. Test pit backfilled with excavated soils and tamped to grade.

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-5

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0368-1
Latitude	: 45.58570	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.40267	Logged By	: LS	Project	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	Reviewed By	: TJN	Location	: Camas, Washington, USA
Total Depth	: 6.5 ft BGL	Date	: 11/04/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Medium stiff, dark brown, SILT, some clay; rooted to 4 inches bgs; moist.				
	S1				21		2.0	
2							1.5	
3			GM	Dense, gray, SILTY GRAVEL; slightly moist.			4.5+	
4				Stiff, red brown with gray and red mottling, SILTY CLAY; dry to slightly moist.			4.5+	
	S2		CL-ML		22	53		Infiltration testing completed at 4.5 feet bgs
5								
	S3				16			
6			GM	Very dense, gray brown, SILTY GRAVEL AND BOULDERS; with boulders up to 24 inches in diameter; dry to slightly moist.				

Terminated due to practical equipment refusal. Groundwater not encountered.
Test pit backfilled with excavated soils and tamped to grade.

CRITICAL AREAS REPORT & BUFFER MITIGATION PLAN

Project:

The Reserve at Green Mountain

Applicant:

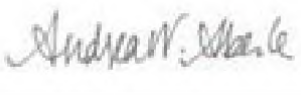
Pacific Lifestyle Homes
11815 NE 99th Street,
Vancouver WA, 98682

Prepared By:

Ash ECO SOLUTIONS, LLC

May 1 , 2025

The information in this report was compiled to meet the requirements of the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. This report has been prepared under the supervision and direction of the undersigned, a qualified professional following CMC Section 16.61.020.A.



Andrea W. Aberle, Sr. Biologist
AshEco Solutions, LLC

SITE INFORMATION:

Parcel No(s):	173192000
Acreage:	11.67 acres
Local Jurisdiction:	City of Camas, Washington
Section/Township/Range:	SW¼, S21, T2N, R3E, W.M.
Site Address:	2625 Goodwin Road Camas, WA 98607
Legal Landowner:	Marwan Bahu

TABLE OF CONTENTS

INTRODUCTION **10**
Project Description **10**
Project Location and Background Information **10**
EXISTING CONDITIONS **10**
CRITICAL AREAS MAP RESEARCH **10**
Topography **10**
Soil Survey **10**
Wetlands **11**
Riparian Habitat **12**
Shorelines **12**
WDFW Priority Habitat **12**
METHODOLOGY **12**
Wetlands **12**
Riparian Habitat **13**
WDFW Priority Habitat **13**
Habitats of Local Importance **13**
DOCUMENTED VEGETATION **14**
CRITICAL AREA CONCLUSIONS **14**
Wetlands **14**
Wetland Buffer **14**
BUFFER MITIGATION PLAN **15**
Avoidance and Minimization **15**
PLANTING PLAN **18**
Site Preparation **18**
Plant Materials **19**
Container Stock **19**
Bareroot Species **19**
Planting Methods **19**
Planting Specifications **19**
Maintenance Plan **21**
Monitoring Plan **21**
Monitoring Report Contents **22**

Contingency Plan **22**
Site Protection **22**
MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS **22**
CONCLUSIONS **24**
DISCLAIMER **24**
REFERENCES **25**

TABLES

Table 1. Critical Areas Summary 15
Table 2. Impacts & Mitigation Summary 18
Table 3. Native Planting Plan 20
Table 4. Performance Standards by Monitoring Year 23

FIGURE SET

Figure 1 – Vicinity Map
Figure 2 – Aerial & Topography Map
Figure 3 – Soil Survey & National Wetlands Inventory (NWI) Map
Figure 4 – Riparian Habitat & Species Map
Figure 5 – Shorelines Map
Figure 6 – Priority Habitat & Species Map
Figure 7 – Forest Practices Application Review System (FPARS) Map
Figure 8 – Existing Conditions Map
Figure 9 – Proposed Site Plan
Figure 10 – Tree Plan

APPENDICES

Appendix A – Site Photos
Appendix B – Wetland Determination Datasheets
Appendix C – Wetland Rating Form & Figures
Appendix D – Tree Survey & Table

INTRODUCTION

Project Description

AshEco Solutions, LLC (AES) was contracted by Pacific Lifestyle Homes (PLH) to assess the potential critical areas present within the subject parcel that comprises the proposed subdivision site and develop a mitigation plan to offset project impacts. This Critical Areas Report and Buffer Plan follows the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. PLH proposes construction of 38-lot single family residence subdivision within a parcel of land comprised of 11.67-acres.

Project Location and Background Information

The subject parcel addressed as 2625 Goodwin Road, Camas, Washington (Figure 1), is under the jurisdiction of the City of Camas and is assigned Parcel Number 173192000. The site is surrounded to the east and west by large residential and agricultural lots. North of the property is urban residential lots and south of the property is forest park land owned by Clark County.

EXISTING CONDITIONS

A single-family residence is located within the southern section of the subject parcel. A large accessory building/shop, and another smaller accessory building adjacent to the larger building, are present within the northern section of the property. The residence is accessed from NE Goodwin Road from a paved and gated driveway. Topography, onsite and in the vicinity of the site, consistently falls in elevation from NE Goodwin Road in the north to the south/southwest offsite. Seasonal hydrology ultimately flows southwest to the valley floor where Lacamas Creek is located offsite. A constructed pond is located in the southwest parcel corner inside the wetland boundary onsite. Scattered individual trees, and groups of trees, including Oregon white oak are present throughout the subject parcel. However, otherwise the parcel is generally open, with the northern section historically used for equine and agricultural purposes and the south reserved for the existing residence and expansive lawn area that surrounds it. Little native understory exists within the bulk of the parcel due to a history of grazing of the open pastures and maintained lawn present surrounding the residence. Forested habitat becomes predominant near the southern parcel boundary as the subject parcel abuts Clark County owned lands located directly south of the subject site. It should be noted that a series of trails and a maintained access/logging road is present to the south on the county property with connection ultimately south to Lacamas Lake and Camp Currie park lands.

CRITICAL AREAS MAP RESEARCH

Topography

Topography generally consists of a south facing slope on a terrace above the Lacamas Creek valley. Topography maps show that the overall area drops in elevation from Goodwin Road to the south (Figure 2).

Soil Survey

Soils within the subject parcel are mapped by the NRCS USDA Soil Conservation Service, Soil Survey of Clark County Washington (1972), as Lauren gravelly loam, cemented substratum, 3 to 15 percent slopes (LrC), Cove silty loam, 0 to 3 percent slopes (CvA), and Dollar loam, 0 to 5 percent slopes (DoB) (Figure 3).

The Lauren series consists of deep, somewhat excessively drained, nearly level to gently sloping soils on terraces 50 to 300 feet above the Columbia River. In a few places, on terrace fronts, the soils are steep to very steep. These are very gravelly soils that formed in mixed Columbia River alluvium that contained some volcanic ash. Lauren soils are in the southwestern part of the county, in the vicinity of Mill Plain, Orchards, and Fourth Plain. The original vegetation was Douglas-fir, grand fir, bigleaf maple, vine maple, salal, and ferns. The average annual precipitation is about 48-inches.

Lauren loam, cemented substratum, 3 to 15 percent slopes (LrC) is similar to Lauren gravelly loam, 0 to percent slopes, except that the cementation in this soil is outside the defined range for this soil series. In a typical profile the surface layer is about 14 inches thick. It is very dark brown gravelly loam in the upper part, and very dark brown grayish-brown gravelly clay loam in the lower part. Below the surface layer is firm, dark brown very gravelly clay loam about 21 inches thick. The next layer, to a depth of 60 inches, is dark yellowish-brown very gravelly clay loam. It is weakly cemented. This soil is moderately well drained, surface runoff is slow to medium and the erosion hazard is slight to moderate. Native Oregon white oak and Oregon ash are the predominate with native trees present within this soil series, with Douglas fir predominate in the better drained areas. The Lauren loam 3 to 15 percent slopes is not listed as a hydric soil by the Washington State Hydric Soils List for Clark County (NRCS 2022).

The Cove series consists of deep, very poorly drained, mostly nearly level soils. These soils formed in water-laid deposits in old lakes and ponds and have a clayey subsoil. Typical native vegetation is deciduous trees, sedges, reeds, and water-tolerant shrubs and grasses. Cove

Cove silty loam, 0 to 3 percent slopes (CvA), is found in concave drainageways and in large, flat, old lakebeds. The slope is generally less than 1 percent. In a typical profile the surface layer is very dark graysilty clay about 4 inches thick. Below this is firm clay about 32 inches thick. It is black in the upper part and very dark gray and mottled in the lower part. The underlying material, to a depth of 54 inches, is mottled, light olive-gray gravelly silty clay loam. This soil is very poorly drained and very slowly permeableSurface runoff is very slow, and ponding is common in winter unless drainage is provided. There is no hazard of erosion. The CvA 0 to 3 percent slopes soil type is listed on the Washington State Hydric Soils List for Clark County (NRCS 2022). AES does not agree with the hydric soils mapping over the subject site entirely, but wetlands were identified near the western parcel boundary and the southwest corner of the subject site (Figures 3 and 8).

The Dollar series consists of deep, moderately well drained, nearly level to gently sloping soils. These are medium textured soils that developed in deposits of old Columbia River alluvium. They are on low terraces that adjoin the poorly drained, depressional McBee, coarse variant, soils and the Cove soils. Typical native vegetation is mainly Douglas-fir, grand fir, and some western redcedar, and an understory comprised of salal, Oregon grape, vine maple, and ferns. In areas of transitional to wet soils, the vegetation is red alder and Oregon ash.

Dollar loam, 0 to 5 percent slopes (DoB) can be identified easily by its slightly raised relief with scattered stands of Douglas-fir. In a typical profile the surface layer is dark-brown loam about 6 inches thick. Below this is friable heavy loam about 26 inches thick. It is dark reddish brown in the upper part and dark brown in the lower part. The next layer, to a depth of 60 inches, is very firm and brittle, dark yellowish-brown heavy loam. This soil is moderately well drained. Surface runoff is slow, and the erosion hazard is slight. The DoB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Mapped hydric soils do not necessarily mean that the area is a wetland; hydrology and wetland vegetation must be present to classify an area as a wetland. The same is true for soils that are not mapped as hydric. Wetlands can be found in areas without mapped hydric soils.

Wetlands

Potential wetland presence is mapped within the southwest corner of the parcel by the Clark County GIS MapsOnline (Figure 3). The National Wetland Inventory (NWI) also maps wetlands within the same general area

(Figure 3). Wetlands were identified within the subject parcel by AshEco Solutions (AES) near the western property line and far southwest portion of the site (Figure 8). An additional offsite wetland was also mapped just offsite from the southeastern property corner, Figure 8.

Riparian Habitat
Clark County GIS does not map Riparian Habitat onsite (Figure 4). Within the southeast corner of the subject parcel AES identified an unnamed seasonal, non-fish bearing (Type Ns) stream (Figures 8 and 9). The stream is not mapped by the WA State Department of Natural Resources (DNR) Forest Practices Application Review System (FPARS) (Figure 7).

Shorelines
An offsite Type S Water (Lacamas Creek) is located approximately 0.25 miles southwest of the subject parcel. Type S Waters are considered Shorelines of the State and governed by the City of Camas and Washington State Department of Ecology (ECY). The "Urban Conservancy" shoreline designation is mapped by the Clark County GIS shoreline layer as intruding into the southwest parcel corner, which roughly corresponds with the location of the onsite portion of Wetland A (Figure 5 and Figures 8-9). Wetland A is therefore considered to be an "associated wetland" to the shoreline and governed by the local SMP. The project does not propose direct impacts to this associated wetland to the shoreline and has applied the standard wetland buffer widths as required by the local code.

WDFW Priority Habitat
The Washington Department of Fish and Wildlife (WDFW) maps Oregon white oak habitat within the southeast corner of the subject parcel, Figure 4. AES identified Oregon white oak habitat onsite, both within the southeast corner as well as the central portion of the site. AES also mapped individual oaks onsite in areas not previously mapped by WDFW, Figure 8.

WDFW also indicates that "Cave or Cave-rich Areas" occur within the general area surrounding the subject parcel, though no evidence of caves or rock outcroppings were identified onsite by AES during site reconnaissance.

No riparian habitat was mapped by WDFW, DNR or Clark County GIS within the subject parcel however AES did identify a short section of seasonal stream that contained a well-defined stream channel. It appears this channel conveys seasonal hydrology between the two wetlands mapped by AES during storm events, Figure 8.

METHODOLOGY

Wetlands
The study area and immediate offsite vicinity was evaluated for the presence of wetlands using the Routine Determination Method per the U.S. Army Corps of Engineers' (USACE's) *Wetland Delineation Manual* (1987), the *Washington State Wetlands Identification and Delineation Manual* (1997), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, Version 2.0* (USACE 2010). The Routine Determination Method examines three parameters to determine if wetlands exist in a given area: vegetation, hydrology, and soils. The presence of hydrology is critical in identifying wetlands; however, since hydrologic conditions can change periodically (hourly, daily, or seasonally), it is necessary to determine if hydrophytic vegetation and hydric soils are also present. By definition, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of

vegetation typically adapted for life in saturated soil conditions. Wetlands are regulated as "Waters of the United States" by the USACE, "Waters of the State" by Washington State Department of Ecology (ECY), and locally by CMC section 16.53 Wetlands. Wetlands were identified by AES in the southwest corner of the subject parcel (extending offsite to the west), and just offsite from the southeast corner of the subject parcel, Figure 8.See Appendix B for formal test plot data collected onsite by AES. See Appendix A for representative site photos.

Riparian Habitat

The methodology used for determining the location of the OHWM of the unnamed seasonal, non-fish bearing (Type Ns) stream followed the Washington State Department of Ecology's (ECY) Determining the OHWM on Streams in Washington State (2010). See Appendix A for representative site photos.

WDFW Priority Habitat

The subject site was evaluated for the presence of Priority Habitats as defined by WDFW Priority Habitats and Species (PHS) List 2008. WDFW PHS system maps Oregon white oak habitat onsite and adjacent to the subject parcel and the PHS system indicates that "Cave or Cave-rich Areas" occur in areas surrounding the subject parcel (Figure 6).

WDFW defines Caves as, *"A naturally occurring cavity, recess, void, or system of interconnected passages (including associated dendritic tubes, cracks, and fissures) which occurs under the earth in soils, rock, ice, or other geological formations, and is large enough to contain a human. Mine shafts (a human-made excavation in the earth usually used to extract minerals) may mimic caves and abandoned mine shafts with actual or suspected occurrences of priority species should be treated in a manner similar to caves."*

WDFW defines Oregon White Oak Woodlands as, "*stands of oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%; or where total canopy coverage of the stand is <25%, but oak accounts for at least 50% of the canopy coverage. The latter is often referred to as oak savanna. In non-urbanized areas west of the Cascades, priority oak habitat consists of stands > 0.4 ha (1.0 ac) in size. East of the Cascades, priority oak habitat consists of stands > 2 ha (5 ac) in size. In urban or urbanizing areas, single oaks or stands < 0.4 ha (1 ac) may also be considered a priority when found to be particularly valuable to fish and wildlife (i.e., they contain many cavities, have a large diameter at breast height [dbh]* (generally 20-inches dbh and greater)*, are used by priority species, or have a large canopy). Oak woodlands in western Washington may contain understory plants indicative of Prairie*."

No caves were identified onsite or immediately offsite near the subject parcel. Oregon white oak habitat consisting of individual oak trees were identified within or immediately adjacent to the subject parcel (Figure 8). The subject site is within an incorporated city and is urban, therefore the individual Oregon white oak trees are considered Priority Habitat by WDFW. There are areas onsite where the oak trees are more densely populated and/or located within areas of shared Douglas-fir canopy, but these areas do not meet the above definition for oak woodland or savanna. The outer dripline of the canopy for the individual oak trees measuring 20-inches dbh or greater onsite were therefore mapped and professionally surveyed by PLS Engineering, Figures 8-10 and Appendix D. See Appendix A for representative site photos. The project does not propose impacts to the onsite oak habitat. The wetland buffer mitigation plan includes the restoration and enhancement of the onsite oak habitat, Figure 9

Habitats of Local Importance

Following CMC Chapter 16.61 - Fish And Wildlife Habitat Conservation Areas, Section: 16.61.010.A.3.a,

individual Oregon white oak trees with a twenty-inch diameter at breast height (20-inches dbh), stands of Oregon white oak trees greater than one acre when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height, are used by priority species, or have a large canopy), and all Oregon white oak snags unless determined by an arborist to be a hazard, are considered Habitats of Local Importance and therefore are regulated by CMC. The tree survey identified approximately sixteen (16) jurisdictional Oregon white oak trees onsite that had greater than 20-inch dbh measurements, See Appendix D.

DOCUMENTED VEGETATION

The vegetation onsite has been disturbed by equestrian use and historic mowing activities, with non-native and invasive grasses and herbs dominate throughout areas historically grazed within the northern and central sections of the parcel. Scattered trees present within the onsite central section include Douglas-fir (*Pseudotsuga menzisii* FACU) and Oregon white oak (*Quercus garryana* FACU).

South of the subject parcel is a forested wetland mosaic area owned by Clark County. This area is much more biologically diverse and slightly overlaps with onsite areas along the southern parcel boundary and corners. Vegetation identified in this area includes Douglas-fir (*Pseudotsuga menzisii* FACU), Oregon white oak (*Quercus garryana* FACU), and Oregon ash (*Fraxinus latifolia* FACW) in the overstory with vine maple (*Acer circinatum* FAC), beaked hazelnut (*Corylus cornuta* FACU), snowberry (*Symphoricarpos albus* FACU), red osier dogwood (*Cornus sericea* FACW), trailing blackberry (*Rubus ursinus* FACU) and salmonberry (*Rubus spectabilis* FAC) in the shrub stratum and sword fern (*Polystichum munitum* FACU), piggy-back plant (*Tolmiea menzisii* FAC), lanceleaf spring beauty (*Claytonia lanceolata* FAC), dovefoot geranium (*Geranium mole* FACU), large leaf avens (*Geum macrophyllum* FACW), and slough sedge (*Carex obnupta* OBL) in the herbaceous stratum.

The indicator categories following the common and scientific name of each vegetation species indicate the likelihood of the species to be found in wetlands. Listed from most-likely to least-likely to be found in wetlands, the indicator categories are:

- **OBL (obligate wetland) –** Occur almost always under natural conditions in wetlands.
- **FACW (facultative wetland) –** Usually occur in wetlands but occasionally found in non-wetlands.
- **FAC (facultative) –** Equally likely to occur in wetlands or non-wetlands.
- **FACU (facultative upland) –** Usually occur in non-wetlands but occasionally found in wetlands.
- **UPL (obligate upland) –** Occur almost always under natural conditions in non-wetlands.
- **NI (no indicator) –** Insufficient data to assign to an indicator category.

CRITICAL AREA CONCLUSIONS

Wetlands

AES identified two wetlands, one partially located onsite and the second located just offsite. Wetland Ais located near the western parcel boundary and within the southwest parcel corner and continues offsite to the west (Figures 8 and 9). Wetland A was rated under the Slope Hydrogeomorphic Classification (HGM) and is considered a Category II wetland that scored high on for habitat functions (8), Appendix C. Wetland B is located just offsite from the southeastern corner of the parcel and was rated under the Depressional HGM classification due to the large area of ponding observed. Wetland B rated as a Category II wetland with a habitat functions score of 8 (Appendix C).

Wetland Buffers

Under the Camas Municipal Code (CMC), wetland buffer widths are established by comparing the wetland rating habitat function score and overall category, and the intensity of proposed land use. Under CMC Table 16.53.040-4 residential use with density higher than 1-unit per acre is considered High Land Use Intensity (LUI). The proposed 38-lot single family residential subdivision will match the current zoning, Single-Family Residential (R-7.5) of the subject parcel comprised of 11.67 acres. The proposed density of the subdivision meets the definition of High LUI under the CMC. Under CMC Table 16.53.040-2, Category II wetlands with a habitat function score of 8 adjacent to proposed High LUI require 260-foot buffers, 195-foot buffers for Moderate LUI, and 130-foot buffers for Low LUI.

Riparian Habitat

Within the southeast corner of the subject parcel AES identified an unnamed seasonal, non-fish bearing (Type Ns) stream (Figures 8 and 9). Type Ns streams require a 25 ft riparian buffer under CMC 16.61.040.D. The areas flanking this stream to the north and south reflect upland conditions. It appears that seasonal hydrology flows from east to west have over time carved out a defined channel within this location.

WDFW Priority Habitat

Oregon white oak woodland and individual Oregon white trees were identified onsite and immediately offsite (Figures 8 and 9). Oregon white oak Priority Habitat is protected by WDFW and also jurisdictional under the local CMC habitat code. The understory and herbaceous layer associated with the onsite oak habitat is highly disturbed due to grazing, lawn mowing or areas dominated by Himalayan blackberry. The dripline of each oak tree canopy was located by survey and is depicted on Figure 8.

Table 1. Critical Areas Summary.

Critical Area	Buffer Width	
Wetland A Category II Wetland (Habitat Score: 8)	***Standard Wetland Buffer***	***LUI Wetland Buffer Reduction***
	260 ft = High LUI Buffer	195 ft = Moderate LUI Buffer
Type Ns Stream	25 ft Riparian Buffer	

BUFFER MITIGATION PLAN

The buffer mitigation plan was developed following Camas Municipal Code CMC) Sections 16.53 Wetlands to offset the project impacts proposed and allow for no net loss of habitat functions onsite.

Avoidance and Minimization

The construction of this residential subdivision within the appropriate zoning location will provide housing for the southwest Washington market, specifically high density residential within the City of Camas where the market demand is high. Following the mitigation sequencing, the project has avoided and minimized impacts to the full extent practicable while still meeting the required design and engineering elements for a subdivision of this size. To utilize the subject site to the fullest following the zoning defined by the city, a large footprint is required to allow for the residential lots, required stormwater facility, internal roadways and the development entrance/exit adequate to accommodate the subdivision. However, the subject site is highly constrained due to due to Category II wetlands and Oregon white oak habitat (Figures 8 and 9).

Despite the large constraints that the critical areas impose, the proposed project has been designed to avoid direct impacts to the wetlands, Oregon white oak habitat, and the highest functioning mature forested buffer habitat present onsite. Additionally, the project proposes extensive wetland buffer enhancement and Oregon

white oak habitat restoration – including habitat corridor connectivity between these historically separated habitats. Therefore, the unavoidable impacts will be offset with adequate mitigation onsite for no net loss of habitat function or values.

The offsite portion of the Wetland A unit provides moderately high to high functions. However, the onsite portion of Wetland A has had historic impacts due to excavation to create a pond within the wetland. The buffer habitat onsite within the southwestern corner of the subject parcel has also been degraded by historic agricultural use/grazing, mowing and is generally dominated by monotypic vegetation including invasive reed canarygrass, lawn grasses, and non-native Himalayan blackberry. This has resulted in a lack of biodiversity and special habitat features, with minimal plant community structure for the onsite wetland and buffer. The project has shown avoidance and minimization of impacts by avoiding direct impacts to the highest functioning buffer habitat and oak habitat while utilizing the historically impacted areas of the subject site for development (existing building footprints, parking and driveway areas, maintained lawn areas, and historic agriculture fields that have been highly managed over the history of the site due to equestrian use). The southern and southwest areas of the subject site are the most constrained due to the significant wetland buffers and oak habitat located in this area. These critical areas highly constrain this portion of the site, thereby making full use of this open area impossible without buffer impacts of some degree. Where the site is less constrained in the east, the project was designed to hold the standard base wetland buffer widths (Figure 9).

The proposed single-family residence subdivision has been designed to avoid onsite critical areas to the extent possible while still providing a residential subdivision meeting the density and design requirements required by the City of Camas. The onsite wetland, stream buffer, and Oregon white oak habitat present have been avoided by the proposed development. However, with the majority of the southern subject parcel encumbered by a substantial wetland buffer (260 feet), impacts to this buffer area are unavoidable. Therefore, the project proposes to modify the buffer area over an area of historically impacted and maintained lawn surrounding the existing house in the southwest portion of the subject parcel.

Wetland Buffer Reduction

CMC 16.53.050.C.1.a.i-ii allows the standard High LUI wetland buffer width (260 ft) to be reduced to the Moderate LUI buffer (195 ft) if a relatively undisturbed corridor at least 100-ft feet wide is protected between the wetland and any other priority habitats present (as defined by the WDFW) and measures to minimize the impacts of the land use adjacent to the wetlands are applied.

In addition to the wetland and buffer habitat identified onsite, Oregon white oak habitat is present onsite and is classified by WDFW as a priority habitat (Figures 8 and 9). Though there are portions of Wetland A offsite that provide moderate to high functions due the scrub-shrub and forested habitat present, the onsite portions of the onsite wetland buffer habitat is degraded from historic residential mowing and overall lacks diversity of the vegetation and habitat structure. The project proposes reduction of the 260 ft High LUI wetland buffer to the 195 ft Moderate LUI buffer by establishing 100 ft minimum corridor between Category II wetlands and the onsite Oregon white oak priority habitat (Figure 9). In many areas the proposed corridor exceeds 100 ft width, see Figure 9. The proposed habitat corridor connectivity is quite extensive, as it will essentially connect the central oak habitat west and south to the Wetland A buffer, then continue east connecting to the Wetland B buffer and multiple individual oak trees present within this area along the eastern property line.

Additionally, the restoration of the central oak habitat area is proposed as the existing asphalt driveway will be removed and be replaced with native vegetation/understory enhancement. By removing this section of

paved driveway, an even more extensive habitat corridor connection between the onsite oak habitat and the wetland will be provided as the driveway has acted to fragment this oak habitat for many years.

The project has also been designed to minimize the impacts of the land use adjacent to the wetlands in accordance with CMC 16.53.050.C.1.a.ii. The proposed project includes stormwater infiltration and has been designed so that development is located outside of areas currently dominated by native vegetation, areas of mature native forested buffer vegetation and the Oregon white oak habitat present onsite. The development has also been designed to be located as far as possible from the onsite wetland to avoid and minimize noise and light directed to the wetland. After implementing the above buffer reduction allowance, the modified base buffer width is considered to be the Moderate LUI buffer or 195 feet.

Wetland Buffer Impacts to the Modified Buffer

After modifying the standard buffer from 260 feet to 195 feet and applying the above outlined avoidance and minimization measures to the onsite critical areas, the project will have unavoidable impacts to two portions of the outer 195-foot wetland buffer over a total area of 25,983 sf. These impact areas can be offset by enhancement over 74,831 sf of the adjacent buffer at a 2.88:1 ratio to the impact area, Figure 9. As outlined by CMC, buffer reduction is allowed over degraded areas when invasive species removal (of the Himalayan blackberry present) and native enhancement is provided to offset the potential loss of buffer functions and values.

Wetland Buffer Impacts due to Stormwater Facility

To allow for the stormwater pond within the buffer of the Category II wetland with a high habitat score (8), additional buffer impacts and mitigation are proposed. Even though the offsite portions of the wetland unit provide higher functions, this onsite buffer area where the stormwater facility is proposed is degraded and consists of monotypic lawn grasses with no significant vegetation to be impacted. The area of buffer impact imposed by the stormwater facility has been quantified to be 11,010 sf, Figure 9. The project proposes to offset this buffer impact area at approximately a 1.24:1 ratio by buffer averaging nearby (and north of the standard 260-foot base buffer width otherwise held by the project along the eastern property boundary) over an area totaling 13,698 sf in size, Figure 9.

Additionally, this buffer averaging area (as well as the adjacent buffer to the south) will be enhanced resulting in a 3:1 mitigation ratio to the impacts. A total of 33,030 sf of buffer habitat will be enhanced and when combined with the averaging area (which exceeds the standard 1:1 ratio) these mitigation measures will ensure that the construction of the stormwater facility within the outer portion of the Category II buffer will have no net loss of buffer area or functions. Additionally, the area surrounding the stormwater facility to the south will be enhanced as it is part of the overall buffer enhancement previously outlined. Under CMC 16.53.050.2, wetland buffer averaging is allowed in conjunction with other reductions in buffer width.

This buffer averaging and enhancement area also contains individual Oregon white oak habitat that can be connected to the central and southern oak habitat/wetland buffer vegetated corridor when combined with the native buffer enhancement activities allowing for the maximum onsite corridor connection possible between the various habitats.

Habitat Enhancement Summary

In total, the habitat enhancement proposed will cover 126,908 sf. This total enhancement area is comprised by the onsite wetland buffer areas totaling 107,861 (74,831 sf + 33,030 sf) and the Oregon white oak habitat restoration area of 19,047 sf. See Table 2 for a detailed summary of the proposed impacts and mitigation. By

enhancing this entire wetland buffer habitat with native trees and shrubs, it will not only upgrade the diversity of the vegetation and structure from the existing lawn, but it will provide a vegetated habitat corridor connection between all the critical areas; Wetlands A and B, Type Ns stream, and Oregon white oak habitat where no connection has historically been present. The buffer enhancement will include the addition of Oregon white oak trees, as well as other native trees and understory shrubs commonly found within oak woodland habitat. This will ultimately create a habitat that will meet the WDFW oak woodland criteria and will upgrade the buffer functions including shielding, habitat and overall diversity to the degraded buffer habitat onsite. As a result the mitigation proposed will provide greater connectivity for wildlife habitat, by increasing shade, shelter, and food sources within multiple locations onsite while also providing greater contiguous habitat corridor connections to the offsite forested wetland (Wetland A) associated with the Lacamas Creek habitat corridor.

Table 2. Impacts & Mitigation Summary.

Critical Area	Impact	Mitigation (Area) 107,861 sf.
Wetlands A & B Buffer Habitat	Buffer Reduction from High to Mod Buffer	**Provide Native Vegetated Corridor Connection Between Category II Wetlands and WDFW PHS** (minimum 100' in width) *Native enhancement of onsite wetland buffers to connect to Oregon white oak habitat* ***Total Habitat Corridor Enhancement Area:*** *"Wetland Buffer" (107,861 sf)* + *"Oak Restoration Area" (19,047 sf)* ***= 126,908 sf***
		Oak Habitat Restoration Area *Removal of Exist. Driveway & Native Enh.* (19,047 sf)
	Lot Impact to 195' Buffer **(25,983 sf)**	**Buffer Enhancement** @ 2.88:1 Ratio **(74,831 sf)**
	Stormwater Pond Impact to 195' Buffer **(11,010 sf)**	Buffer Averaging @ 1.24:1 Ratio (13,698 sf)
		Combined w/ Buffer Enhancement (Averaging area and adjacent buffer) @ 3:1 Ratio **(33,030 sf)**

Note: The total "Wetland Buffer Enhancement" Area includes (74,831 sf + 33,030 sf) = 107,861 as depicted by the aqua hatch on Figure 9.

PLANTING PLAN

Site Preparation

1. Stake or flag the on-site mitigation area boundaries and install tree protection fencing if necessary.

2. Aggressively mow grasses and/or remove invasive species present within the mitigation area prior to planting, paying particular attention to the removal and control of any Himalayan blackberry as requried.

Plant Materials

The plants specified for the buffer mitigation are native species designed to diversify the existing plant community, provide an increase in woody structure and wildlife habitat on a short- and long-term basis, thereby increasing the ecological functions of the riparian habitat. The specified shrubs will grow quickly, forming an intertwining understory layer within the mitigation areas, and over time the specified trees will provide structural and biological diversity.

Container Stock

Plants will be purchased from a native-plant nursery and meet size specifications outlined under the planting plan, see Table 3.

Bareroot Species

1. Plants will be purchased from a native plant nursery and meet size specifications outlined under the planting plan, see Table 3.
2. Bareroot sock will be kept cool and moist prior to being planted.
3. Bareroot stock will have well-developed roots and sturdy stems with a good root-to-shoot ratio.
4. No damaged or desiccated roots or diseased plants will be used.
5. Unplanted bareroot stock will be stored properly at end of planting day(s) to prevent desiccation.

Planting Methods

Plant in fall through early spring (October-April) at specified spacing following the planting plan.

Container/bareroot stock

1. Dig hole using a tree shovel/auger or comparable tool 16-inches wide and 4-inches deeper than the root system, scarify sides of hole to 4 inches. Remove plant from container and loosen roots with hand or score vertically on sides and bottom with knife. Set plant upright and plumb in hole so the crown is just above the finish grade. Ensure that roots are extended down entirely and do not bend upward.
2. Replace loose soil around plant and firmly compact the soil around the plant to eliminate air spaces. Do not use frozen soil for backfilling.
3. Firmly compact the soil around the planted species to eliminate air spaces.
4. Install woody mulch around the base of planted species to insulate plantings, maintain moisture content of soil and reduce invasive plant competition (when deemed necessary).
5. Irrigate according to performance standards for the first three summers after planting or as site and weather conditions warrant.

Planting Specifications

Planting will begin in Fall of 2025, or Winter/Spring of 2026 or Fall of 2026, while onsite soils are saturated (and stock is dormant). The following tables summarize the native plant selection, spacing, size, and quantity for the on-site mitigation area:

Table 3. Native Planting Plan.

Wetland Buffer Enhancement 107,861 sq. ft.				
Common Name	*Scientific Name*	*Stock*	*Spacing*	*Quantity*
Trees				
Oregon white oak	*Quercus garryana*	1-gallon or 24-36" bare-root	20 ft.	50
Douglas fir	*Pseudotsuga menziesii*	1-gallon or 24-36" bare-root	10 ft.	100
Big leaf maple	*Acer macrophyllum*	1-gallon or 24-36" bare-root	10 ft	100
Bitter cherry	*Prunus emarginata*	1-gallon or 24-36" bare-root	10 ft.	100
			Trees =	350
Shrubs				
Beaked hazelnut	*Corylus cornuta*	1-gallon or 24-36" bare-root	6 ft.	150
Nootka rose	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	200
Ocean spray	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	100
Serviceberry	*Amelanchier alnifolia*	1-gallon or 24-36" bare-root	6 ft.	100
Snowberry	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	200
Vine maple	*Acer circinatum*	1-gallon or 24-36" bare-root	6 ft.	100
			Shrubs =	850
			Grand Total =	**1,200**
Oregon White Oak Habitat Restoration 19,047 sq. ft.				
Common Name	*Scientific Name*	*Stock*	*Spacing*	*Quantity*
Trees				
Bitter cherry	*Prunus emarginata*	1-gallon or 24-36" bare-root	10 ft.	10
Cascara	*Frangula purshiana*	1-gallon or 24-36" bare-root	10 ft.	10
			Trees =	20
Shrubs				
Beaked hazelnut	*Corylus cornuta*	1-gallon or 24-36" bare-root	6 ft.	35
Nootka rose	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	35
Oceanspray	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	35
Serviceberry	*Amelanchier alnifolia*	1-gallon or 24-36" bare-root	6 ft.	35
Snowberry	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	50
			Shrubs =	190
			Grand Total =	**210**

Oak Restoration Driveway Removal Area Seeding :	
Native Uplands Mix	**Recommended Seeding Rate**
Mix Includes: California Brome - *Bromus carinatus* Blue Wildrye - *Elymus glaucus* Streambank Lupine - *Lupinus rivularis* Western Yarrow - *Achillea millefolium*	1 lb. per 1,000 square feet

Notes:
1. The "Native Uplands" mix can be sourced from Sunmark Seeds. An adequate substitution is the "Native Upland Mix with Color" sourced from ProTime (PT 404).
2. (Buffer Reduction Area in Mod LUI Buffer (25,983 sf.) Mitigated for by Buffer Enhancement @ 2.88:1 ratio to Impacts or 74,831 sf.)(Storm Water Pond (11,010 sf.) Mitigated for by Buffer Enhancement @ 3:1 ratio to Impacts or 33,030 sf.)

Maintenance Plan
Maintenance of the buffer mitigation area(s) is a five-year process and will involve removing persisting invasive plant species in addition to watering and re-installing failed native species as necessary. The maintenance will include the following activities when necessary:

1. Remove and control non-native/noxious vegetation around all newly installed plants. During years 1 through 3 invasive species will be removed and suppressed as often as necessary to meet a performance standard of no greater than 20 percent cover by invasive species, measured by monitoring plots.

2. Irrigate planted species as necessary during the dry season, approximately July 1 through October 15. Irrigation is recommended to occur on a two-week cycle (minimum) during the dry season for the first three years. Water will be provided by a temporary above-ground irrigation system or a water truck.

3. Replace dead or failed plants as described for the original installation to meet the minimum annual performance standard of 100% survival in the first year, 90% survival in the second year, and 80% survival in years 3-5.

Monitoring Plan
The buffer mitigation area(s) will be monitored for a 5-year period following project construction; monitoring will take place in years 1, 2, 3 and 5. Monitoring reports will be submitted to the City of Camas by the end of each monitored year. The goal of monitoring is to determine if the previously stated performance standards are being met. The mitigation area will be monitored once during the growing season, preferably during the same two-week period each year to better compare the data.

During the first annual monitoring and maintenance event, two representative photo plots will be selected in the mitigation areas permanently marked with metal posts. Monitoring photo plot locations will be placed on an as-built drawing and included in the annual monitoring reports.

Vegetation
Vegetative monitoring will document the woody scrub-shrub canopy developing within the mitigation area. The following information will be included at each sample plot:

- Percent cover and frequency of sapling/shrub species
- Species composition of herbs, shrubs, and trees, including non-native/noxious, invasive species

- Photo documentation of vegetative changes over time

Monitoring Report Contents
The annual monitoring reports will contain at least the following:

- Location map and as-built drawing.
- Photographs from permanent photo points (x2 minimum).
- Historic description of project, including dates of plant installation, current year of monitoring, and restatement of mitigation goal.
- Documentation of plant survival, cover, and overall development of the plant community.
- Assessment of non-native, invasive plant species and recommendations for management.
- Summary of maintenance and contingency measures proposed for the next season and completed for the past season.

Contingency Plan
If the performance standards are not met by the fifth year following project completion, or at an earlier time if specified above, a contingency plan will be developed and implemented. All contingency actions will be undertaken only after consulting and gaining approval from the City of Camas. The applicant will be required to complete a contingency plan that describes (1) the causes of failure, (2) proposed corrective actions, (3) a schedule for completing corrective actions, and (4) whether additional maintenance and monitoring are necessary.

Site Protection
The on-site mitigation area will be owned and managed by the applicant or assignee. AshEco Solutions, LLC or similar entity will be responsible for supervising the maintenance and conducting the monitoring of the on-site mitigation area for the 5-year period at expense of the applicant. The applicant will establish and record a permanent and irrevocable conservation covenant on the mitigation property.

MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS

Objective 1: Provide a native vegetated habitat corridor between the wetlands and Oregon white oak habitat, and enhance 107,861 sf of the wetland buffer with natives following Table 3.
Performance Standard 1a. Document the installation of the native plant species specified by Table 3. Submit As-built documenting planting locations, plant species, and plant quantities. *Site prep is to include the removal of invasive species as needed.*
Performance Standard 1b. In Year 1, planted species are to achieve 100 percent (100%) survival one year after the site is planted. The survival rate is to be determined by comparison of baseline vegetation data collected during production of the As-built Map. (If dead plants are replaced in Year 1 to achieve the 100 percent survival rate, this performance standard will be met).
Performance Standard 1c. In Year 2, mitigation plant communities will achieve the densities listed in Table 4.
Performance Standard 1d. In Year 5, the mitigation plant community will achieve 30-percent (30%) aerial cover of woody species. (If plants are added, that achieve this cover requirement, this performance standard will be met).
Performance Standard 1e. In All Years, non-native/invasive plant species will not exceed 20-percent (20%) aerial cover across the onsite mitigation area.

Objective 2: Provide the Oregon white oak habitat restoration over 19,047sf (as depicted on Figure 9) to provide full connectivity between the wetland and oak habitat onsite and enhance with natives as outlined in Table 3.
Performance Standard 2a. Document the removal of the existing paved driveway and the installation of the native grass seed within old driveway footprint and install native shrub species as specified by Table 3. Submit As-built documenting planting locations, plant species, and plant quantities.
Performance Standard 2b. In Year 1, planted species are to achieve 100 percent (100%) survival one year after the site is planted. The survival rate is to be determined by comparison of baseline vegetation data collected during production of the As-built Map. (If dead plants are replaced in Year 1 to achieve the 100 percent survival rate, this performance standard will be met).
Performance Standard 2c. In Year 2, mitigation plant communities will achieve the densities listed in Table 4.
Performance Standard 2d. In Year 5, the mitigation plant community will achieve 30-percent (30%) aerial cover of woody species. (If plants are added, that achieve this cover requirement, this performance standard is met).
Performance Standard 2e. In All Years, non-native/invasive plant species will not exceed 20-percent (20%) aerial cover across the onsite mitigation area.

Objective 3: Provide 13,698 sf buffer averaging area to offset the location of the stormwater facility within the buffer at a 1.24:1 ratio.
Performance Standard 3a. Document the buffer averaging area (as depicted on Figure 9) within the conservation covenant.
Performance Standard 3b. Enhance the buffer averaging area as part of the total buffer enhancement proposed under Objective 1, following the outlined performance standards for Objective 1.

Objective 4: Provide long-term protection for the buffer enhancement areas.
Performance Standard 4a. Record a conservation covenant with the City of Camas. This performance standard will be met when the Year 1 monitoring report is submitted that includes a copy of the approved and recorded conservation covenant.
Performance Standard 4b. Post permanent boundary signage every 200 feet along the outer edge of the onsite mitigation boundary or as otherwise determined by the Shoreline Administrator. Signage will remain in legible condition; if they are missing or illegible, they will be replaced. This performance standard will be met when signs are documented to be in place and of good condition within the final monitoring report.

Signs are to read:

"Critical Area – Please Retain in a Natural State"

or as otherwise determined by the City of Camas permit conditions.

Table 4. Performance Standards by Monitoring Year.

Habitat Type	Performance Standards by Year			
	Year 1	Year 2	Year 3	Year 5
Wetland Buffer and Oak Woodland Enhancement Areas				
Planted Vegetation Survival	100%	---	---	---
Woody Species Density	---	10-14' respectively (on center)	10-14' respectively (on center)	---
Woody Species Aerial Cover	---	---	---	30%
Invasive Plant Species				
Invasive/Non-native plant species	< 10%	< 20%	< 20%	< 20%

CONCLUSIONS

The above sections outline how the proposed project will meet the CMC Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. The project will not impose direct impact the onsite wetlands, unnamed seasonal stream or buffer and will also retain all of the Oregon white oak habitat present onsite. The buffer mitigation proposal will ultimately result in an ecological uplift of the onsite wetland buffers and oak habitat while providing extensive connectivity by providing a native vegetated corridor connecting all critical area habitats over degraded areas that have been historically fragmented the habitat connectivity. With issuance of the approved critical areas permits, the proposed buffer mitigation activities will be implemented, and a conservation covenant will be recorded to protect the onsite critical areas and critical area buffers, under the applicant's ownership, in perpetuity.

DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigator. It is correct and complete to the best of our knowledge. It should be considered a preliminary mitigation plan and used at your own risk until it has been reviewed and approved in writing by the local agency with jurisdiction over the site. AES personnel base the above listed conclusions on standard scientific methodology and best professional judgment.

REFERENCES

City of Camas Municipal Code. 2008 (Amended). Section 16.53 Wetlands.

City of Camas Municipal Code. 2008 (Amended). Section 16.61 Fish and Wildlife Habitat Conservation Areas.

Clark County Geographic Information Systems. Available at: http:/gis.clark.wa.gov/mapsonline/ [Accessed 2025].

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Online edition. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Olson, P. & Stockdale, E. 2010. Washington State Department of Ecology: Determining the Ordinary High Water Mark on Streams in Washington State. Second Review Draft. Ecology Publication #08-06-001.

U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). 1974. Soil Survey of Clark County Area. Online document. Available at: http://websoilsurvey.nrcs.usda.gov/app/. [Accessed August 2022]

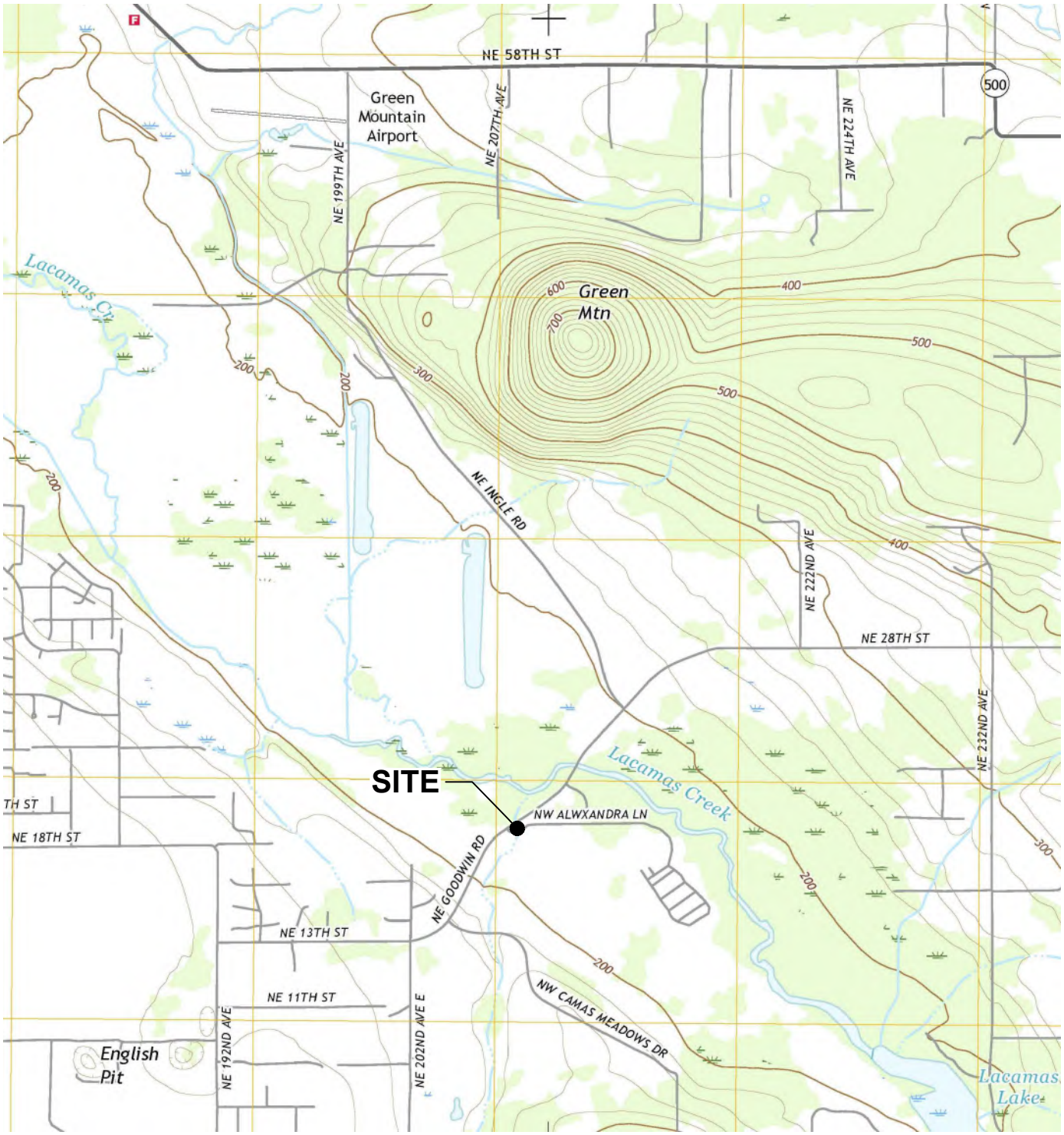
U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). 2022. Washington State Hydric Soils List. Available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. [Accessed 2025].

U. S. Fish & Wildlife Service. 2022. National Wetlands Inventory. Online document. Available at: http:www.wetlandsfws.er.usgs.gov/NWI/index.html. [Accessed 2025].

Wakeley, J.S.; R.W. Lichvar; and C.V. Noble, eds. U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Washington State Department of Ecology (WDOE). 1997. Washington State Wetlands Identification and Delineation Manual. Publication #96-94. Olympia, Washington.

Washington State Department of Fish and Wildlife (WDFW). Management Recommendations for Washington's Priority Habitats – Oregon White Oak Woodlands (Larsen, 1998).



NOTE(S):
USGS, LACAMAS CREEK QUADRANGLE
WASHINGTON-CLARK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

PURPOSE: XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	VICINITY MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 1 **DATE:** 4-15-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg



Legend

- Taxlots
- Contours Lines - 2 ft
- Contour Lines - 10 ft
- Contour Lines - 100 ft

N

0 250 500

SCALE IN FEET
1" = 250'

AshECO SOLUTIONS, LLC

PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

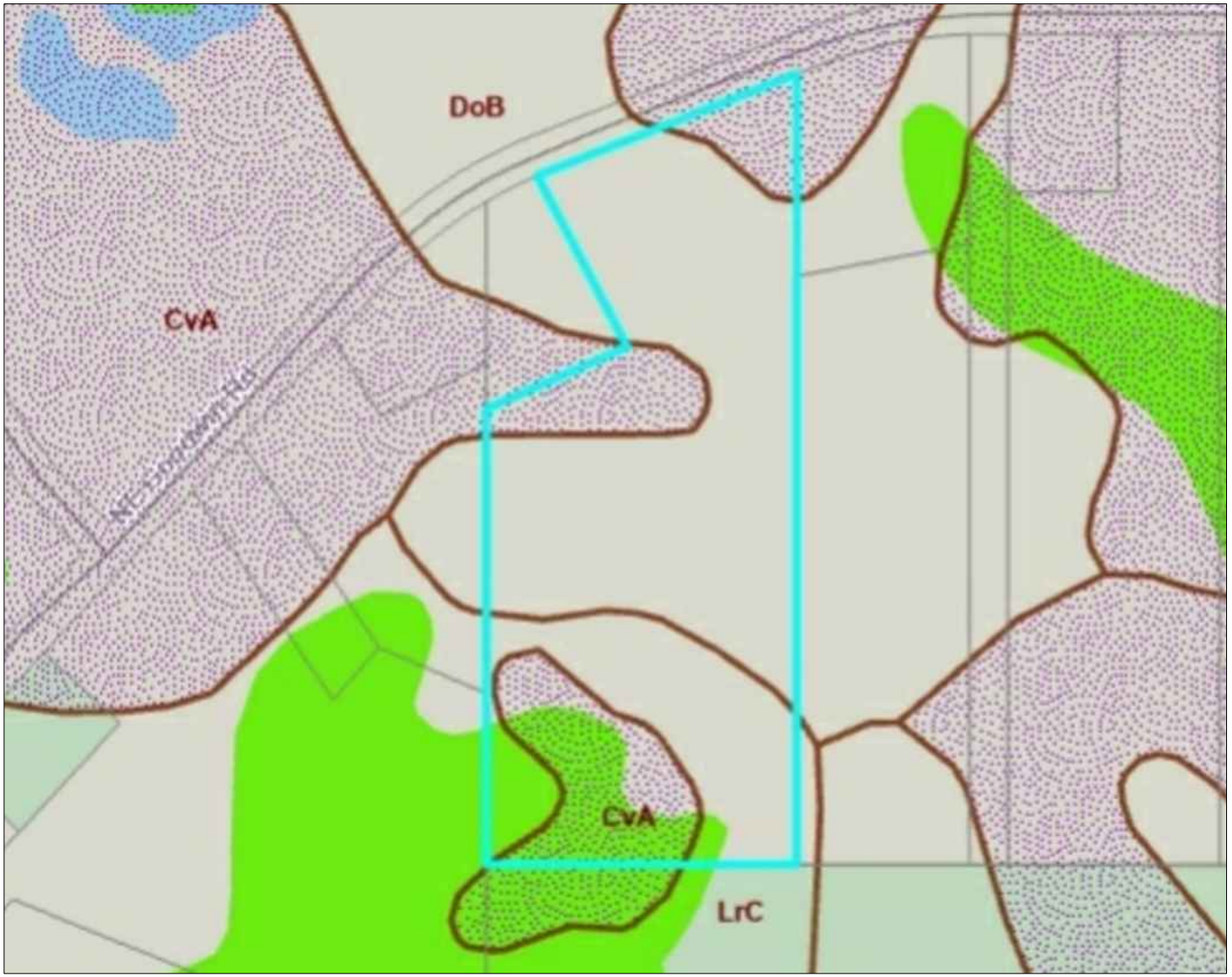
AERIAL PHOTO & TOPO MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: PLH Goodwin Rd.
PARCEL #: 173192000
SITE LOCATION ADDRESS:
2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 2
DATE: 4-15-25

...utocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg

Exhibit 5 SUB25-1004



Legend

- Taxlots
- Soil Type
- Hydric Soils
- Potential Wetlands Presence
- Permitted Wetland
- NWI Wetland

CvA - Cove silty loam, 0 to 3 percent slopes

DoB- Dollar loam, 0 to 5 percent slopes

LrC - Lauren gravelly loam, cemented substratum, 3 to 15 percent slopes

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	SOIL SURVEY & NATIONAL WETLANDS INVENTORY MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 3 **DATE:** 4-15-25

Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg

Exhibit 5 SUB25-1004



Legend

- Taxlots
- Species
  - Species Area
  - Adjacent to Species Area
- Habitat
  - Habitat Area
  - Adjacent to Habitat Area
- Riparian Habitat
- Stream
- Lake

N

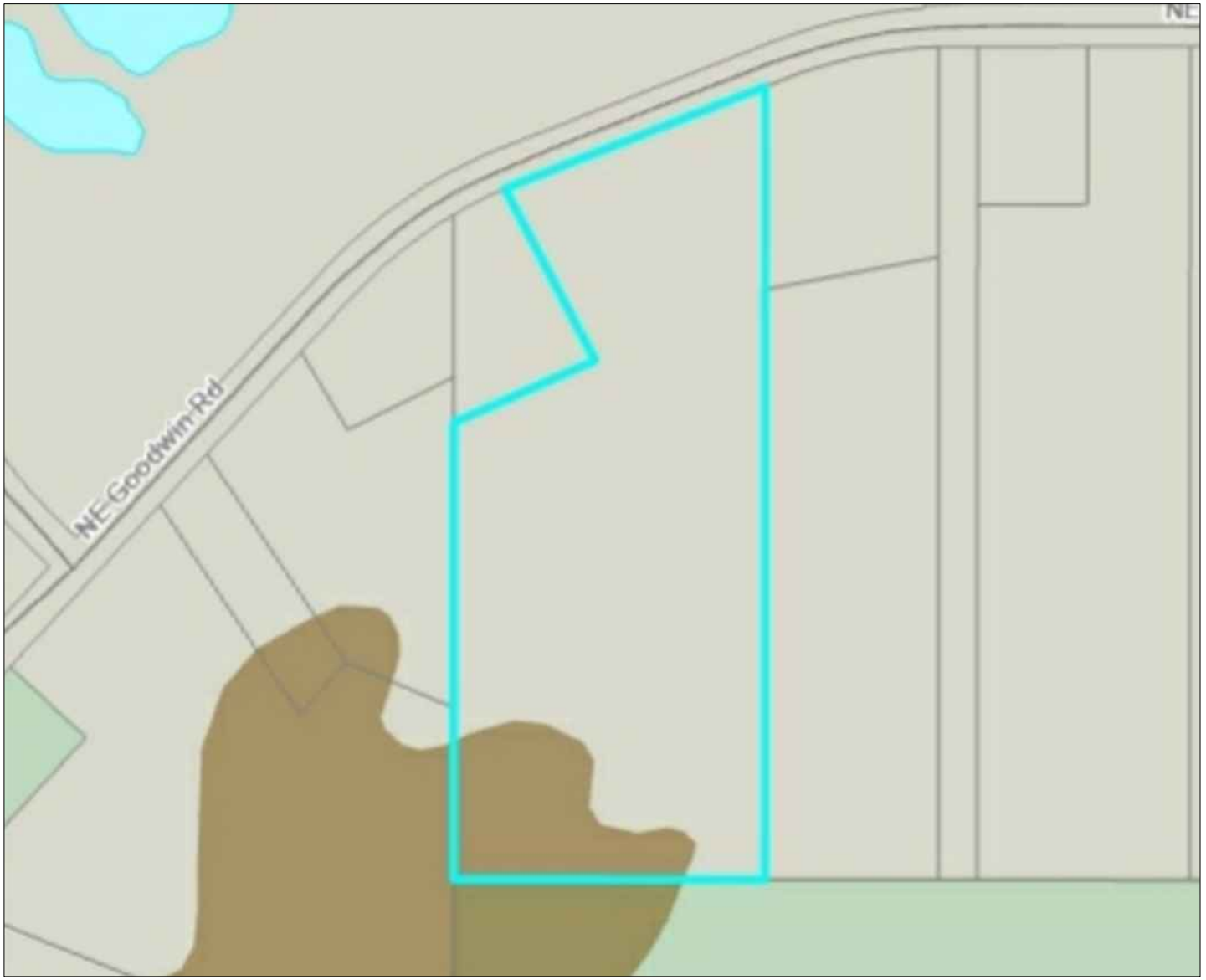
0 250 500

SCALE IN FEET
1" = 250'

AshECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	RIPARIAN HABITAT & SPECIES MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 4 **DATE:** 4-15-25

...Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg

Exhibit 5 SUB25-1004



Legend

- Taxlots
- Stream
- Lake

Shoreline Designations

- Aquatic
- Natural
- Urban Conservancy
- Medium Intensity
- High Intensity
- Rural Conservancy Residential
- Rural Conservancy Resource Land

N

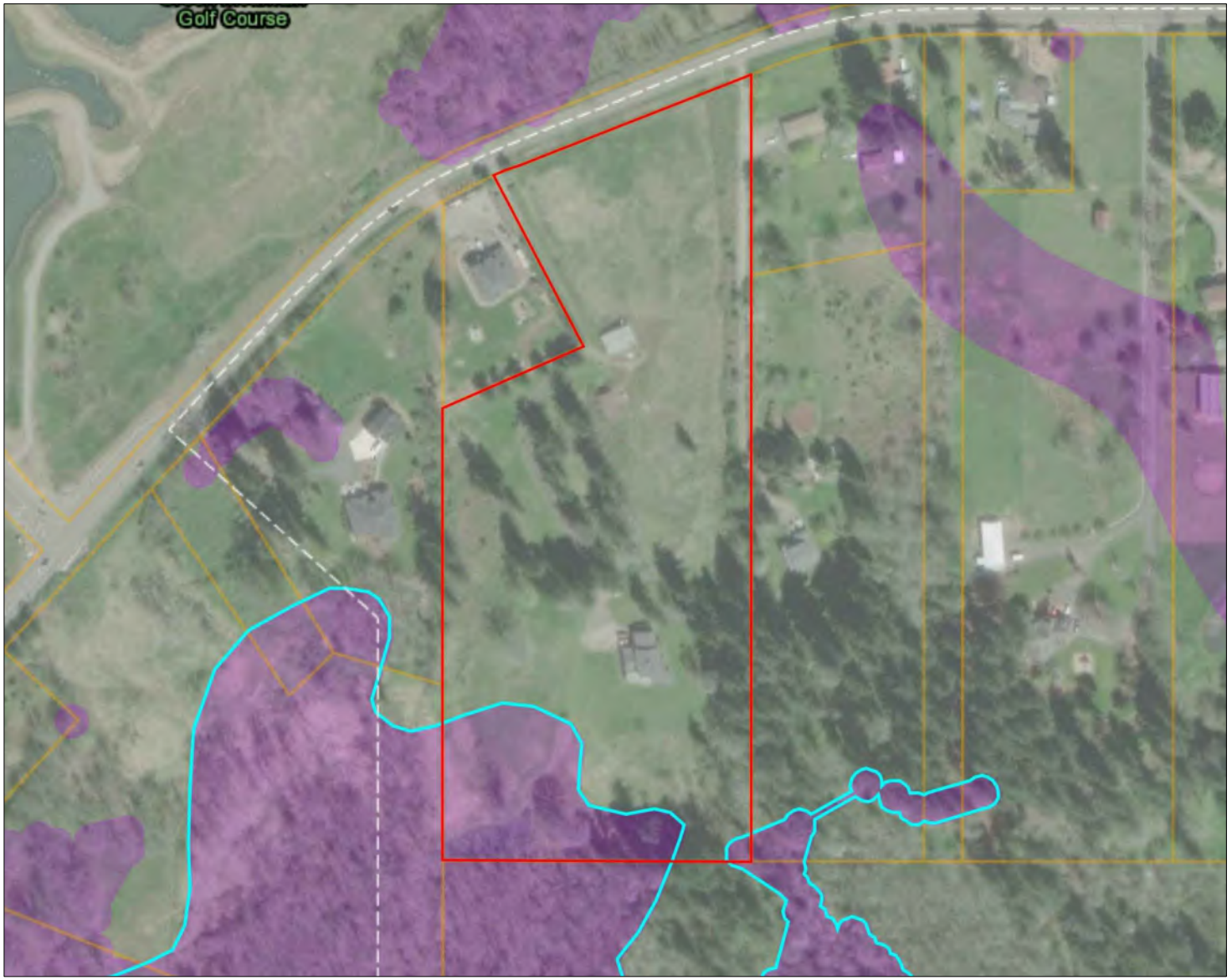
0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	SHORELINES MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 5 **DATE:** 4-15-25

...\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg

Exhibit 5 SUB25-1004



Legend

Parcels

Parcels

PHS on the Web

PHS Public Points

PHS Public Lines

PHS Public Polygon Outlines

AS MAPPED

Masked

PHS Public Polygons

AS MAPPED

SECTION

QTR-TWP

TOWNSHIP

N

0 250 500

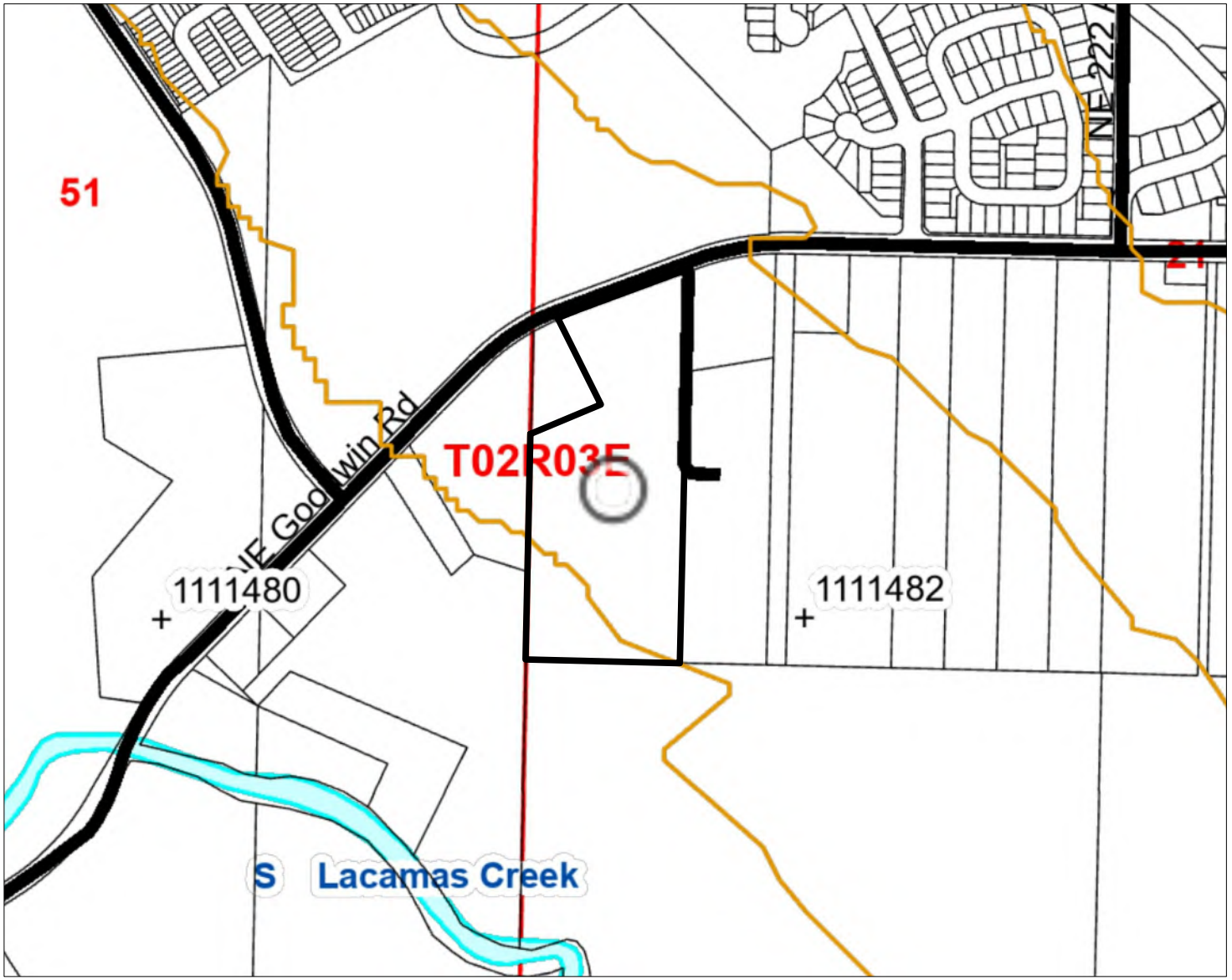
SCALE IN FEET

1" = 250'

AshECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	PRIORITY HABITAT & SPECIES MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 6 **DATE:** 4-15-25

Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg

Exhibit 5 SUB25-1004



N

0 500 1000

SCALE IN FEET
1" = 500'

	PURPOSE: XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	FPARS MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 7 **DATE:** 4-15-25

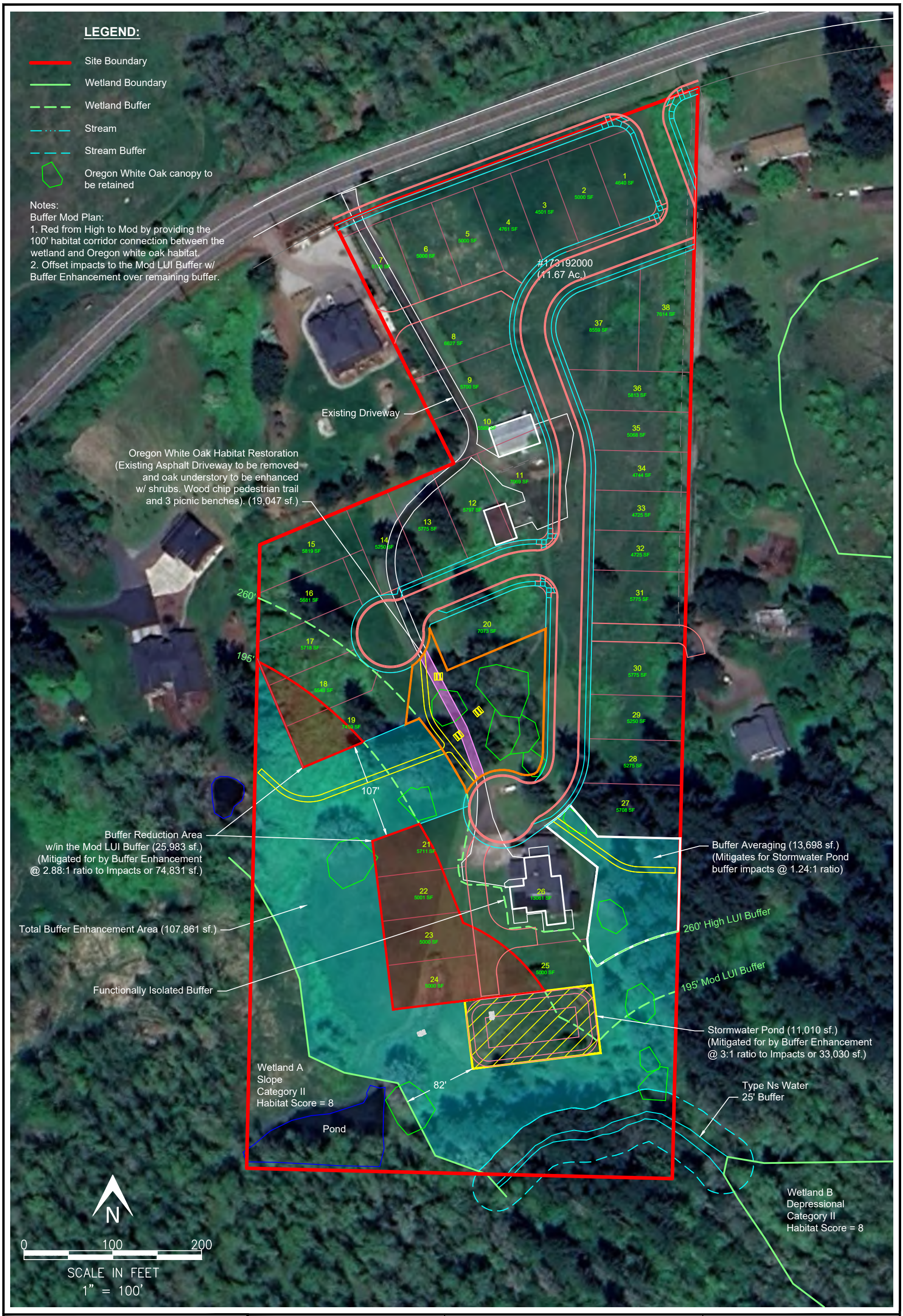
...Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg

Exhibit 5 SUB25-1004



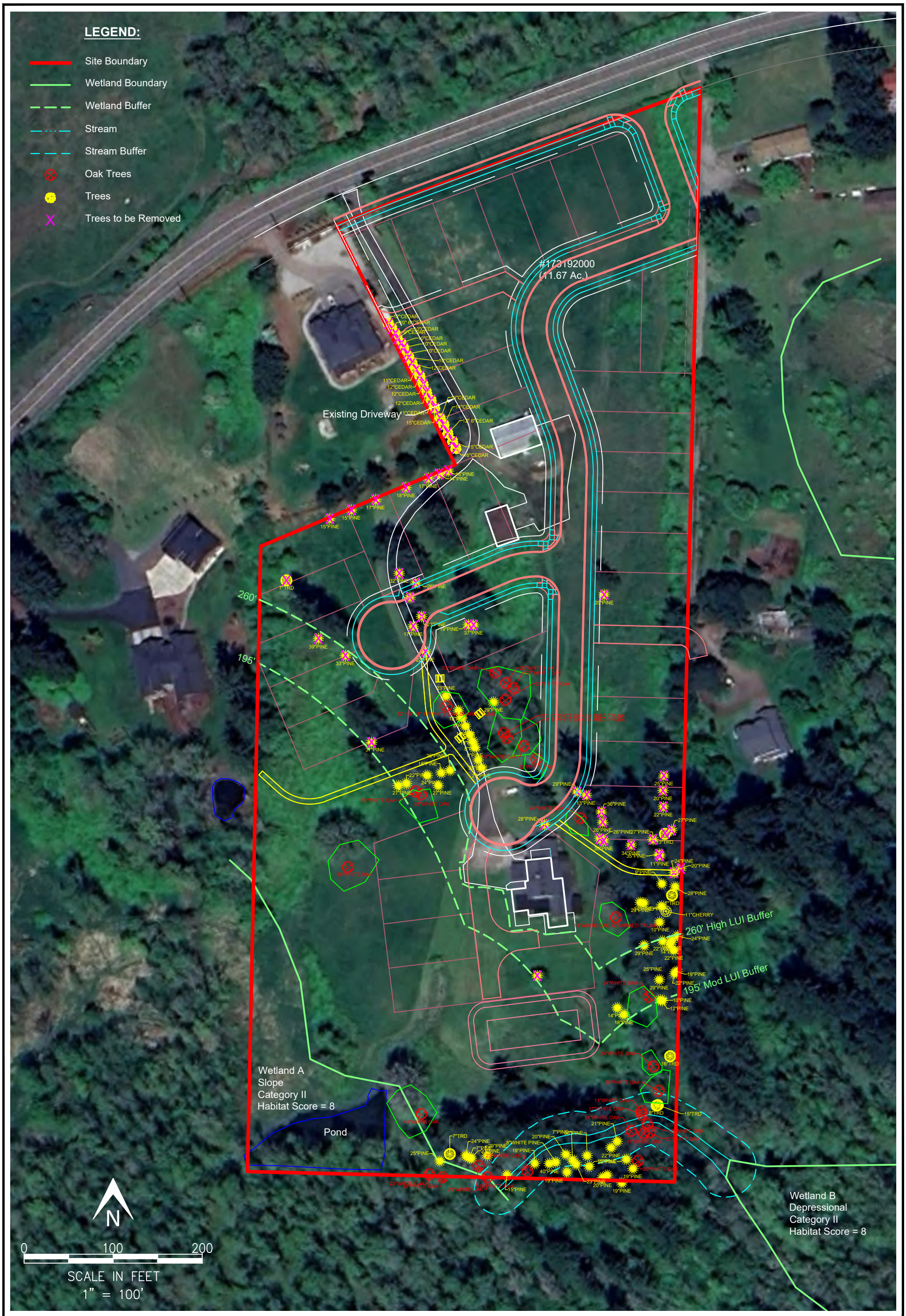
Ash ECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	EXISTING CONDITIONS **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 8 **DATE:** 4-30-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-043025.dwg



Ash ECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	PROPOSED SITE PLAN **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 9 **DATE:** 5-6-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-050625.dwg



Ash ECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	TREE PLAN **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 10 **DATE:** 5-6-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-050625.dwg

Appendix A

Site Photos

Reserve at Green Mountain - Site Photos



Photo 1.
View of the existing residence located within the southern portion of the proposed development. This southern open area of the parcel generally degraded from landscape mowing activities as it is dominated by grass lawn.



Photo 2.
View of the general area, north of the existing residence, within the proposed development.



Photo 3.
View into a portion of Wetland A dominated by invasive reed canarygrass. The eastern extent of this wetland along the western parcel boundary of the subject parcel is dominated by Himalayan blackberry.

Reserve at Green Mountain - Site Photos



Photo 4.
View east over the man-made pond excavated within Wetland A, located in the southwest corner of the subject parcel. An individual Oregon white oak tree present directly northeast of the pond is visible in upper/central portion of this photo.



Photo 5.
View into Oregon white oak located with central area of the site. This oak habitat will be retained and the understory enhanced with native shrubs.



Photo 6.
View of the individual Oregon white oak located along the western property boundary. Wetland A is located directly west from this oak tree, at left of photo view. This oak will be retained and a habitat corridor connection will be created by implementing the buffer mitigation plan. This includes retention of this oak and other adjacent oaks and the enhancement of the surrounding habitat corridor to provide a vegetated wildlife corridor where none has historically been present due to the existing maintained lawn and driveway.

Reserve at Green Mountain - Site Photos



Photo 7.
View south down the existing paved residential driveway that has bisected the Oregon white oak habitat located within the central portion of the parcel. The driveway will be removed and the understory habitat restored with native plantings to provide a vegetated corridor connecting the mature oak habitat onsite as well as connect it to the nearby wetland habitat. corridor to provide a vegetated wildlife corridor where none has historically been present due to the existing maintained lawn and driveway.



Photo 8.
View west down the Type Ns stream that conveys seasonal hydrology down slope from Wetland B in the east to Wetland A in the west.





Photo 9.
View into the central ponded portion of Wetland B located just off site to the east.

Appendix B

Wetland Determination Datasheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: The Reserve at Green Mt - Wetland A City/County: Camas/Clark Sampling Date: _____

Applicant/Owner: Pacfic Lifestyle Homes State: WA Sampling Point: TP-1

Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0-3

Subregion (LRR): LRRA Lat: 45.639463° Long: -122.451880° Datum: _____

Soil Map Unit Name: Cove silty clay loam, 0-3% slopes NWI classification: PFOA - South of subject site

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:
Test plot is located in upland. Only one of 3-wetland indicators is present. Dominate vegetation is faculative.
No hydric soils or hydrology indicators occur within plot.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: 30ft diameter)			
1. Rubus armeniacus	100%	Y	FAC
2.			
	100% = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/2	100%						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: The Reserve at Green Mt - Wetland A City/County: Camas/Clark Sampling Date: _____

Applicant/Owner: Pacfic Lifestyle Homes State: WA Sampling Point: TP-2

Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0-3%

Subregion (LRR): LRRA Lat: 45.639463° Long: -122.451880° Datum: _____

Soil Map Unit Name: Lauren gravelly loam, cemented substratum, 3% to 15% slopes NWI classification: PFOA - South of subject site

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:
Test plot is located in upland. Only one of 3-wetland indicators is present. Dominate vegetation is faculative.
No hydric soils or hydrology indicators occur within plot.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30ft diameter)			
1. Salix sitchensis	40%	Y	FACW
2.			
3.			
4.			
5.			
	40% = Total Cover		
Herb Stratum (Plot size: 5ft diameter)			
1. Phalaris arundinacea	90%	Y	FACW
2. Juncus effusus	10%	N	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: TP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/2	98%	5YR 3/2	2%	C	M	clay loam	
							clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 2" BGS

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: The Reserve at Green Mt - Wetland A City/County: Camas/Clark Sampling Date: _____

Applicant/Owner: Pacfic Lifestyle Homes State: WA Sampling Point: TP-3

Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0-3

Subregion (LRR): LRRA Lat: 45.639463° Long: -122.451880° Datum: _____

Soil Map Unit Name: Cove silty clay loam, 0-3% slopes NWI classification: PFOA - South of subject site

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:
Test plot is located in upland. Only one of 3-wetland indicators is present. Dominate vegetation is faculative.
No hydric soils or hydrology indicators occur within plot.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft diameter)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudotsuga menziesii	60%	Y	FACU
2. Tsuga heterophylla	20%	Y	FACU
3.			
4.			
	80% = Total Cover		
Sapling/Shrub Stratum (Plot size: 30ft diameter)			
1. Symphoricarpos albus	20%	Y	FACU
2.			
3.			
4.			
5.			
	20% = Total Cover		
Herb Stratum (Plot size: 5ft diameter)			
1. Polystichum munitum	20%	Y	FACU
2. Tellima grandiflora	20%	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: 30ft diameter)			
1. Rubus armeniacus	30%	Y	FAC
2.			
	30% = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: TP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16"	10YR 4/1	100%					loamy clay	mixed matrix
	10YR 4/2	100%					loamy clay	mixed matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: The Reserve at Green Mt - Wetland A City/County: Camas/Clark Sampling Date: _____

Applicant/Owner: Pacfic Lifestyle Homes State: WA Sampling Point: TP-4

Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0-3%

Subregion (LRR): LRRA Lat: 45.639463° Long: -122.451880° Datum: _____

Soil Map Unit Name: Lauren gravelly loam, cemented substratum, 3% to 15% slopes NWI classification: PFOA - South of subject site

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:
Test plot is located in upland. Only one of 3-wetland indicators is present. Dominate vegetation is faculative.
No hydric soils or hydrology indicators occur within plot.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30ft diameter)			
1. Symphoricarpos albus	40%	Y	FACU
2. Rosa nutkana	20%	Y	FACU
3.			
4.			
5.			
	40% = Total Cover		
Herb Stratum (Plot size: 5ft diameter)			
1. Phalaris arundinacea	40%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: 30ft diameter)			
1. Rubus armeniacus	20%	Y	FAC
2.			
	20% = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: TP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/2	98%	5YR 3/2	2%	C	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 0.5-1"

Water Table Present? Yes ✓ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix C

Wetland Rating Form & Figures

Wetland name or number Wetland A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): The Reserve at Green Mt - Wetland A Date of site visit: 3/25

Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___No Date of training 10/16

HGM Class used for rating slope Wetland has multiple HGM classes? ___Y ✓ N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY II (based on functions ✓ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27
✓ **Category II** – Total score = 20 - 22
_____**Category III** – Total score = 16 - 19
_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M **L**	H **M** L	**H** M L	
Landscape Potential	H **M** L	H **M** L	H **M** L	
Value	**H** M L	H **M** L	**H** M L	**TOTAL**
Score Based on Ratings	6	6	8	20

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	

Wetland name or number Wetland A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	Figure 1
Hydroperiods	H 1.2	Figure 1
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	Figure 1
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	Figure 1
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	Figure 1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	Figure 2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	Figure 3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	Figure 3

Wetland name or number Wetland A

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ✓ The wetland is on a slope (slope can be very gradual),
   ✓ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   ✓ The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number Wetland A

5. Does the entire wetland unit **meet all** of the following criteria?
   ____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**
   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number Wetland A

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (A 1% slope has a 1 ft vertical change in elevation for every 100 ft of horizontal distance.) Slope is 1% or less — points = 3 Slope is > 1%-2% — points = 2 Slope is > 2%-5% — points = 1 Slope is greater than 5% — points = 0	2
S 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed, and plants are higher than 6 in. Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 Dense, uncut, herbaceous plants > ½ of area — points = 3 Dense, woody, plants > ½ of area — points = 2 Dense, uncut, herbaceous plants > ¼ of area — points = 1 Does not meet any of the criteria above for plants — points = 0	3
Total for S 1 — Add the points in the boxes above	5

Rating of Site Potential If score is: ___**12 = H** ___**6-11 = M** ✓ **0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources adjacent septic systems Yes = 1 No = 0	1
Total for S 2 — Add the points in the boxes above	2

Rating of Landscape Potential If score is: ✓ **1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? (At least one aquatic resource in the basin is on the 303(d) list.) Yes = 1 No = 0	1
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which unit is found.) Yes = 2 No = 0	1
Total for S 3 — Add the points in the boxes above	3

Rating of Value If score is: ✓ **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number Wetland A

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows. Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	1

Rating of Site Potential If score is: ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	1

Rating of Landscape Potential If score is: ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately downgradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther downgradient points = 1 No flooding problems anywhere downstream points = 0	1
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	1

Rating of Value If score is: __ **2-4 = H** ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number Wetland A

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac. **2**

____Aquatic bed	4 structures or more: points = 4
____Emergent	3 structures: points = 2
☑ Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1
☑ Forested (areas where trees have > 30% cover)	1 structure: points = 0

If the unit has a Forested class, check if:

☑ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods **3**

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

☑ Permanently flooded or inundated	4 or more types present: points = 3
☑ Seasonally flooded or inundated	3 types present: points = 2
____Occasionally flooded or inundated	2 types present: points = 1
☑ Saturated only	1 type present: points = 0
☑ Permanently flowing stream or river in, or adjacent to, the wetland	
____Intermittently or seasonally flowing stream in, or adjacent to, the wetland	
____**Lake Fringe wetland**	**2 points**
____**Freshwater tidal wetland**	**2 points**

H 1.3. Richness of plant species **2**

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

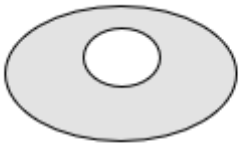
If you counted: > 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = 0

H 1.4. Interspersion of habitats **3**

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

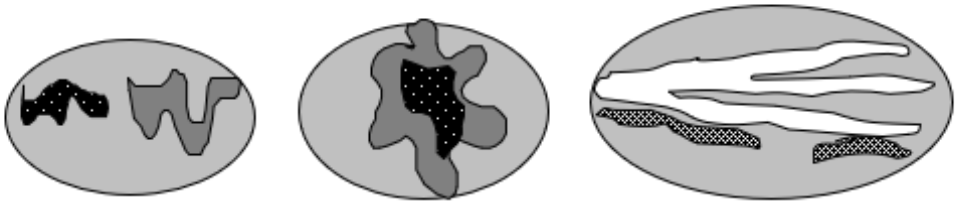


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



Wetland name or number Wetland A

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ✓ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ✓ Standing snags (dbh > 4 in.) within the wetland ✓ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ✓ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ✓ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ___ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	5
Total for H 1 Add the points in the boxes above	15

Rating of Site Potential If score is: ✓ **15-18 = H** ___ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat ~~16%~~ **+** [(~~18%~~ moderate and low intensity land uses)/2] = ~~17%~~ Total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0 7% Accessible + (31/2) 15.5% = 22.5%	2
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat ~~16%~~ **+** [(~~18%~~ moderate and low intensity land uses)/2] = ~~22%~~ Total habitat > 50% of Polygon points = 3 Total habitat 10-50% and in 1-3 patches points = 2 Total habitat 10-50% and > 3 patches points = 1 Total habitat < 10% of 1 km Polygon points = 0 20% Undist + (15.5%) = 35.5 (4 patches)	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0 High LUI = 42	0
Total for H 2 Add the points in the boxes above	~~3~~ 1

Rating of Landscape Potential If score is: ___ **4-6 = H** ✓ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ✓ It has 3 or more Priority Habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW Priority Species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: ✓ **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number Wetland A

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

✓ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number Wetland A

✓ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

✓ **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

✓ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number B

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland B Date of site visit: 3/25

Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___ No Date of training 10/06

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___ Y _X_ N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.

Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY II (based on functions ✓ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_X_**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	(H) M L	
Landscape Potential	H (M) L	H (M) L	H (M) L	
Value	(H) M L	H (M) L	(H) M L	**TOTAL**
Score Based on Ratings	7	6	8	21

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	✓

Wetland name or number B

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number B

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ✓ The wetland is on a slope (*slope can be very gradual*),
   ✓ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   X The water leaves the wetland **without being impounded**. (Dependant on beaver activity)

   NO – go to 5 **YES** – The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number B

NO – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number B

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	9

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? Yes = 2 No = 0	1
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: ✓ **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number B

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	8

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

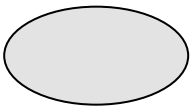
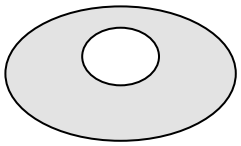
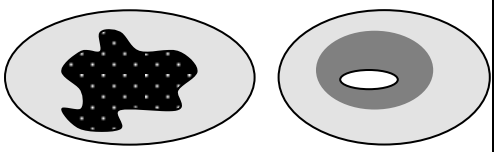
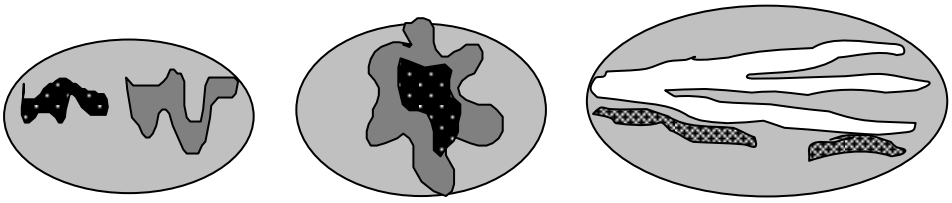
D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	0
Total for D 5 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther down-gradient. points = 1 Flooding from groundwater is an issue in the sub-basin. points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland. points = 0	1
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	1

Rating of Value If score is: ___ **2-4 = H** ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number B

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* X Aquatic bed — 4 structures or more: points = 4 X Emergent — 3 structures: points = 2 X Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 X Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	4
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ____Permanently flooded or inundated — 4 or more types present: points = 3 X Seasonally flooded or inundated — 3 types present: points = 2 ____Occasionally flooded or inundated — 2 types present: points = 1 X Saturated only — 1 type present: points = 0 ____Permanently flowing stream or river in, or adjacent to, the wetland X Seasonally flowing stream in, or adjacent to, the wetland ____**Lake Fringe wetland** — **2 points** ____**Freshwater tidal wetland** — **2 points**	2
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	2
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points  **Low** = 1 point  **Moderate** = 2 points All three diagrams in this row are **HIGH** = 3points 	2

Wetland name or number B

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* X Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). X Standing snags (dbh > 4 in) within the wetland X Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* X At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* X Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	5
Total for H 1 Add the points in the boxes above	15

Rating of Site Potential If score is: ✓ **15-18 = H** ___ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon 7% Accessible + (31/2) 15.5% = 22.5% points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches 20% Undist + (15.5%) = 35.5 (4 patches) points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use High = 42% points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	0
Total for H 2 Add the points in the boxes above	3

Rating of Landscape Potential If score is: ___ **4-6 = H** ✓ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 X It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: ✓ **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number B

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

✓ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

✓ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes **–** Go to **SC 2.2** No **–** Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

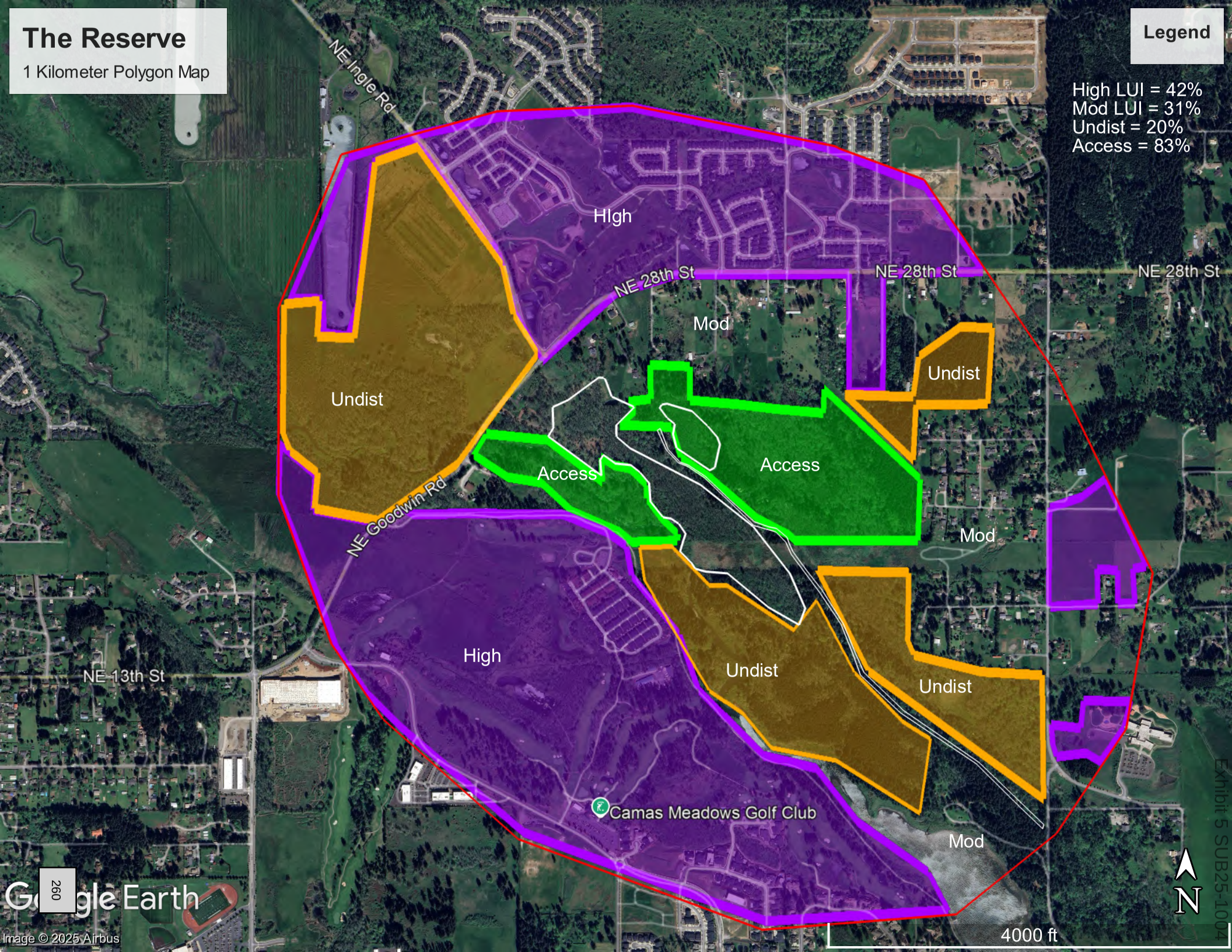
Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

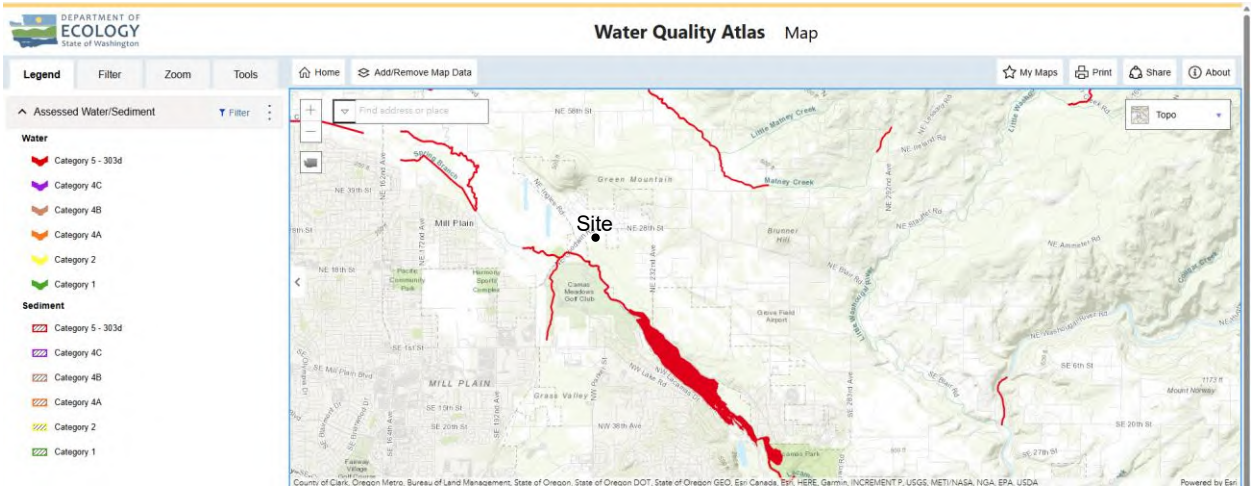
Wetland name or number _____

This page left blank intentionally

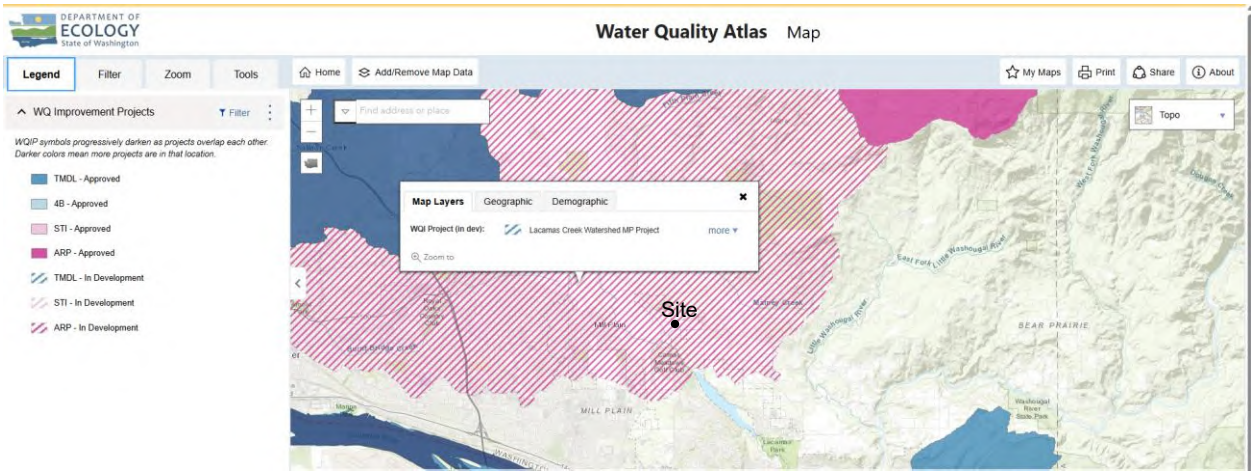

The Reserve
Wetland Unit Map
Legend
NE 28th St
Wetland A
Slope Wetland Unit
(Hydrology collects in small depressions throughout, seasonal sheet flow south over unit to Lacamas Creek, overbank flooding doesn't appear to extend over this full area).
Wetland B
Depressional Wetland Unit
(Ponding throughout, unidirectional flow southwest via stream channel, sits higher in elevation that the wetland to west).
Unit Break
Cowardin Plant Classes:
Forested
Scrub/Shrub
Dense Ridge Plant Cover
Hydroperiods:
Permanently flooded,
Seasonally flooded,
aturated Adjacent to
Permanently Flowing Stream
(Lacamas Creek)
Riverine Unit
(Due to overbank
flooding from Lacamas Cr)
Unit Break
Cowardin Plant Classes:
Aquatic
Emergent
Forested
Scrub/Shrub
Hydroperiods:
Seasonally flooded,
Saturated,
Adjacent to Seasonally Flowing Stream
Lacamas Church of God Campground
Lacamas Cr.
Unit Break
Riverine Unit
(Due to overbank
flooding from Lacamas Cr)
Keith Upkes Coaching
N
1000 ft
Image © 2025 Maxar Technologies


The Reserve
1 Kilometer Polygon Map
Legend
High LUI = 42%
Mod LUI = 31%
Undist = 20%
Access = 83%
NE Ingle Rd
HIgh
NE 28th St
NE 28th St
NE 28th St
Mod
Undist
Undist
Access
Access
NE Goodwin Rd
Mod
High
Undist
Undist
NE 13th St
Camas Meadows Golf Club
Mod
260
Google Earth
Image © 2025 Airbus
4000 ft
N
Exhibit 5 SUB25-1004

The Reserve at Green Mt.
WRF Figure 3



↑Screen capture of map of 303(d) listed waters in basin (from Ecology website).



↑Screen capture of list of TMDLs for WRIA in which unit is found (from Ecology website).

Appendix D

Tree Plan (Map & Table)

EXISTING CONDITIONS SURVEY

IN THE NW 1/4 OF THE SW 1/4
SECTION 21, T. 2 N., R. 3 E., W.M.
CITY OF CAMAS
CLARK COUNTY WASHINGTON

JOB NO. 3927
DATA COLLECT: MARCH 2025
DRAWING DATE: 03-20-2025
SHEET 1 OF 1

LEGEND:

- INDICATES WATER VALVE
- INDICATES FIRE HYDRANT
- INDICATES WATER STAND PIPE
- INDICATES WELL
- INDICATES SANITARY SEWER MANHOLE
- INDICATES SEPTIC SYSTEM LID
- INDICATES POWER POLE WITH DIRECTION OF OVERHEAD LINES
- INDICATES GUY ANCHOR
- INDICATES ELECTRIC METER
- INDICATES TRANSFORMER
- INDICATES HEAT PUMP
- INDICATES GAS VALVE
- INDICATES SIGN
- INDICATES WETLAND FLAG
- INDICATES EVERGREEN TREE WITH TRUNK DIAMETER AND TYPE
- INDICATES DECIDUOUS TREE WITH TRUNK DIAMETER AND TYPE
- INDICATES FIBER OPTIC PEDESTAL
- INDICATES MAIL BOX
- INDICATES BOUNDARY
- INDICATES EDGE OF ASPHALT
- INDICATES EDGE OF CONCRETE
- INDICATES EDGE OF GRAVEL
- INDICATES 5 FOOT INTERVAL CONTOUR
- INDICATES 1 FOOT INTERVAL CONTOUR
- INDICATES FENCE LINE
- INDICATES EDGE OF WATER
- INDICATES PAVE STRIPE
- INDICATES OVERHEAD POWER
- INDICATES TREE DRIP LINE

NOTES:

1. THIS SURVEY WAS DRAWN FOR PLAT SURVEY PREVIOUS AND ADVANTAGES FOUND. THIS IS NOT INTENDED TO BE A BOUNDARY SURVEY. NO PROPERTY CORNERS WERE SET IN THIS SURVEY.
2. NO WARRANTIES ARE MADE AS TO MATTERS OF UNWRITTEN TITLE, SUCH AS ADVERSE POSSESSION, ESTOPPEL, ACQUIESCENCE, ETC.
3. A PRIVATE UTILITY LOCATE WAS CALLED FOR ON 03-26-2025. THE UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE ONLY. UNDERGROUND CONNECTIONS ARE SHOWN AS PER OBSERVED EVIDENCE. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST THAT ARE NOT SHOWN. SOME UNDERGROUND LOCATIONS HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. M.G.S. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS.

HORIZONTAL DATUM:
NAD 83 (2011)
WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, U.S. SURVEY FEET. BASED ON REAL TIME KINEMATIC CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK.

VERTICAL DATUM:
NGVD29(47) CLARK COUNTY DATUM, DERIVED BY WSRN OBSERVATIONS. NAVD88) TO NGVD 29(47)=-3.21'

SCALE 1 INCH = 60 FEET

PLS ENGINEERING

Engineering - Surveying - Planning
604 W. Evergreen Blvd., Vancouver, WA 98660
PH: (360) 944-6519 FAX: (360) 944-6539

EXISTING CONDITIONS SURVEY

IN THE NW 1/4 OF THE SW 1/4
SECTION 21, T. 2 N., R. 3 E., W.M.
CITY OF CAMAS
CLARK COUNTY WASHINGTON

JOB NO.: 3927
DATA COLLECT: MARCH 2025
DRAWING DATE: 03-20-2025
SHEET 1 OF 1

Point Table	
Point #	Raw Description
10937	7"TRD
10938	9"FIR
10943	11"CHERRY
10944	25"FIR
10945	24"FIR
10948	14"FIR
10949	22"FIR
10951	19"FIR
10952	22"FIR
10954	29"FIR
10960	22"FIR
10961	29"FIR
10964	10"FIR
10965	10"FIR
10967	23"FIR
10968	29"FIR
10969	34"FIR
10970	30"FIR
10971	26"FIR
10972	26"FIR
10973	36"FIR
10975	28"FIR
10976	29"FIR
10977	13"FIR
10979	14"FIR
10980	18"FIR
11036	20"FIR
11038	15"FIR
11040	36"FIR
11041	23"FIR
11043	7"FIR
11044	20"FIR
11047	19"FIR
11054	40"FIR
11058	19"FIR
11090	29"FIR
11103	15"FIR
11116	21"FIR
11117	7"FIR
11118	24"FIR

Point Table		
Point #	Raw Description	
11129	7"TRD	
11130	2@"FIR	
20023	12"FIR	
20024	10"FIR	
20041	16"TRD	
20059	8"TRD	
20060	15"TRD	
20114	19"FIR	
20115	2@"FIR	
20117	2@"FIR	
20118	2"FFIR	
20119	19"FIR	
20120	12"FIR	
10974	24"WHITE OAK	
10978	19"WHITE OAK X2 SHARED TRUNK	<20" DBH
11060	23"WHITE OAK	
11064	29"WHITE OAK	
11094	18"WHITE OAK	<20" DBH
11119	18"WHITE OAK	<20" DBH
11120	23"WHITE OAK	
11133	43"WHITE OAK	
20025	24"WHITE OAK	
20045	24"WHITE OAK	
20052	28"WHITE OAK	
20070	1"WHITE OAK	<30" DBH
20076	1"WHITE OAK	<20" DBH
20082	18"WHITE OAK	<20" DBH
20092	10"WHITE OAK	<20" DBH
20093	1"WHITE OAK	<20" DBH
20098	14"WHITE OAK	<20" DBH
20113	29"WHITE OAK	
11048	8"WHITE PINE	

Point Table		
Point #	Raw Description	
20301	14"FIR	
20303	18"FIR	
20304	17"FIR	
20305	15"FIR	
20277	7"TRD	
20278	39"FIR	
20279	33"FIR	
20280	37"FIR	
20281	36"WHITE OAK	
20283	27"FIR	
20284	22"FIR	
20290	25"WHITE OAK	
20296	27"FIR	
20297	24"FIR	
20298	18"FIR	
20299	26"FIR	
20300	18"FIR	
20306	18"FIR	
20307	32"FIR	
20308	26"FIR	
20309	22"FIR	
20310	23"FIR	
20311	17"FIR	
20312	22"FIR	
20313	23"FIR	
20314	12", 14", 14", 18" WHITE OAK SHARE TRUNK	
20319	12"FIR	
20320	8"FIR	
20321	18"FIR	
20322	19"FIR	
20323	8"FIR	
20324	9"FIR	
20325	28"FIR	
20326	27"FIR	
20327	21", 17" WHITE OAK SHARED TRUNK	
20328	9", 6" WHITE OAK SHARED TRUNK	<20" DBH
20285	13" WHITE OAK	<20" DBH
20302	17"FIR	<20" DBH
20338	19" WHITE OAK	<20" DBH
20343	22"WHITE OAK	

Point Table	
Point #	Raw Description
20344	29"FIR
20353	21"WHITE OAK
20354	25"WHITE OAK
20355	22"WHITE OAK
20356	23"WHITE OAK
20362	20"FIR
20363	37"FIR
20364	19"FIR
20498	12"CEDAR
20499	10", 6" CEDAR
20500	9"CEDAR
20501	10"CEDAR
20502	10"CEDAR
20503	10"CEDAR
20504	10"CEDAR
20505	10"CEDAR
20506	12"CEDAR
20507	11"CEDAR
20508	12"CEDAR
20509	12"CEDAR
20510	12"CEDAR
20511	11"CEDAR
20512	15"CEDAR
20513	13"CEDAR
20514	14"CEDAR
20515	12", 6" CEDAR
20516	15"CEDAR
20517	16"CEDAR
10957	25"FIR
10913	25"FIR
10915	20"FIR
10917	22"FIR
10921	27"FIR
10922	13"TRD
10925	27"FIR
10929	35"FIR
10930	11"FIR
10931	24"FIR
10934	20"FIR
10935	28"FIR

LEGEND:

- WV — INDICATES WATER VALVE
- FH — INDICATES FIRE HYDRANT
- INDICATES WATER STAND PIPE
- W — INDICATES WELL
- S — INDICATES SANITARY SEWER MANHOLE
- SEPTIC — INDICATES SEPTIC SYSTEM LID
- INDICATES POWER POLE WITH DIRECTION OF OVERHEAD LINES
- INDICATES GUY ANCHOR
- ELEC — INDICATES ELECTRIC METER
- INDICATES TRANSFORMER
- GAS — INDICATES HEAT PUMP
- GV — INDICATES GAS VALVE
- INDICATES SIGN
- INDICATES WETLAND FLAG
- CONIFER — INDICATES EVERGREEN TREE WITH TRUNK DIAMETER AND TYPE
- DECIDUOUS — INDICATES DECIDUOUS TREE WITH TRUNK DIAMETER AND TYPE
- INDICATES FIBER OPTIC PEDESTAL
- MB — INDICATES MAIL BOX

- INDICATES BOUNDARY
- INDICATES EDGE OF ASPHALT
- INDICATES EDGE OF CONCRETE
- INDICATES EDGE OF GRAVEL
- INDICATES 5 FOOT INTERVAL CONTOUR
- INDICATES 1 FOOT INTERVAL CONTOUR
- INDICATES FENCE LINE
- INDICATES EDGE OF WATER
- INDICATES PAINT STRIPE
- OHP — INDICATES OVER HEAD POWER
- INDICATES TREE DRIP LINE

Note: Tree survey reflects
16 jurisdictional Oregon white oak
present onsite (>20" DBH).

The project will retain all 16 Oregon white oak.

ADAM B. THOMSON — STATE OF WASHINGTON — 21032302 — REGISTERED PROFESSIONAL LAND SURVEYOR

HORIZONTAL DATUM:
NAD 83 (2011)
WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, U.S SURVEY FEET. BASED ON REAL TIME KINEMATIC CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK.

VERTICAL DATUM:
NGVD29(47) CLARK COUNTY DATUM, DERIVED BY WSRN OBSERVATIONS, NAVD(88) TO NGVD 29(47)=-3.21'

NOTES:
1. BOUNDARIES WERE DRAWN PER PLAT. SURVEY RECORDS AND MONUMENTS FOUND. THIS IS NOT INTENDED TO BE A BOUNDARY SURVEY. NO PROPERTY CORNERS WERE SET IN THIS SURVEY.

2. NO WARRANTIES ARE MADE AS TO MATTERS OF UNWRITTEN TITLE, SUCH AS ADVERSE POSSESSION, ESTOPPEL, ACQUIESCENCE, ETC.

3. A PRIVATE UTILITY LOCATE WAS CALLED FOR ON 03-26-2025. THE UNDERGROUND UTILITIES AS SHOWN HEREON ARE AS MARKED AT THE TIME OF THIS SURVEY. UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE ONLY. UNDERGROUND CONNECTIONS ARE SHOWN AS STRAIGHT LINES BETWEEN SURFACE LOCATIONS BUT MAY CONTAIN BENDS OR CURVES NOT SHOWN. SOME UNDERGROUND LOCATIONS HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. M.G.S. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS.

60 30 0 60 90 120
SCALE 1 INCH = 60 FEET

PLS ENGINEERING
Engineering - Surveying - Planning
604 W. Evergreen Blvd., Vancouver, WA 98660
PH: (360) 944-6519 Fax: (360) 944-6539

Exhibit 5 SUB25-1004

ARBOR SCIENCE TREE CARE
SPECIALIZING IN SUSTAINABLE TREE CARE SOLUTIONS
arborsciencetreecare.com
360.521.0249
WA# ARBORST838DT OR CCB# 216351

May 2nd 2025

Pacific Lifestyle Homes

Reserve at Green Mountain
Parcel# 173192000
2625 NE Goodwin Rd
Camas, WA 98607

RE: Tree protection plan and tree inventory.

Tree, Vegetation and Soil Protection During Construction:

During construction. Prior to initiating tree removal on the site, soils, vegetated areas and individual trees to be preserved shall be protected from potentially damaging activities pursuant to the following standards.

A. Placing Materials Near Trees. No person may conduct any activity within the protected area of any tree designated to remain, including, but not limited to, parking equipment, placing solvents, storing building material and soil deposits and dumping concrete washout.

1. During construction, no person shall attach any object to any tree designated for protection.

B. Protective Barrier. Before development, land clearing, filling or any land alteration for which a Tree

Removal Permit is required, the applicant:

1. Shall erect and maintain readily visible protective tree fencing along the outer edge and completely surrounding the protected area of all protected trees or groups of trees that are to remain undisturbed. Fences shall be constructed of chain link and at least four feet high, unless other type of fencing is authorized by the planning official.

2.Shall prohibit excavation or compaction of earth or other potentially damaging activities within the barriers.

3. Shall maintain the protective barriers in place until the planning official authorizes their removal or a final certificate of occupancy is issued, whichever occurs first

4. Shall ensure that any landscaping done in the protected zone subsequent to the removal of the barriers shall be accomplished with light machinery or hand labor. No turf or lawn areas are to be installed within protected area.

5. In addition to the above, the planning official may require the following:

- Cover with mulch to a depth of at least six (6) inches or with plywood or similar material the areas adjoining the critical root zone of a tree in order to protect roots from damage caused by heavy equipment.

- Minimize root damage by excavating a two (2) foot deep trench, at edge of critical root zone, to cleanly sever the roots of trees to be retained.

- Have corrective pruning performed on protected trees in order to avoid damage from machinery or building activity.

- Maintain trees throughout construction period by watering and fertilizing if recommended by Arborist.

C. Grade.

1. The grade shall not be elevated or reduced within the critical root zone of trees to be preserved without the planning official's authorization. The planning official may allow coverage of up to one half of the area of the tree's critical root zone with light soils (no clay) to the minimum depth necessary to carry out grading or landscaping plans, if it will not imperil the survival of the tree. Aeration devices may be required to ensure the tree's survival.

2. If the grade adjacent to a preserved tree is raised such that it could slough or erode into the tree's critical root zone, it shall be permanently stabilized to prevent suffocation of the roots.

3. The applicant shall not install an impervious surface within the critical root zone of any tree to be retained without the authorization of the planning official. The planning official may require specific construction methods and/or use of aeration devices to ensure the tree's survival and to minimize the potential for root induced damage to the impervious surface.

4. To the greatest extent practical, utility trenches shall be located outside of the critical root zone of trees to be retained. The planning official may require that utilities be tunneled under the roots of trees to be retained if the planning official determines that trenching would significantly reduce the chances of the tree's survival.

5. Trees and other vegetation to be retained shall be protected from erosion and sedimentation. Clearing operations shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, shrubs, ground cover and stumps shall be maintained on

the individual lots, where feasible. Where not feasible appropriate erosion control practices shall be implemented pursuant to best management practices within industry standards.

D. Directional felling. Directional felling of trees shall be used to avoid damage to trees designated for retention and shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, shrubs, ground cover and stumps shall be retained where feasible. Where not feasible, appropriate erosion control practices shall be implemented pursuant to

E. Additional requirements. The planning official or Arborist may require additional tree, vegetation and soil protection measures which are consistent with accepted best management practices.

Tree density requirements:

A. Camas municipal code section 18.13.052 requires a minimum density per net acre of 20 tree units per acre. This density may consist of existing trees or replacement trees. This 11.67 acre site requires 233.4 tree units. This sites current density is 999 tree units, with the proposed removals calculating out to 326 tree units. This leaves a net density 673 tree units to be preserved and protected.

Diameter at Breast Height "dbh"	Tree Units	Diameter at Breast Height "dbh"	Tree Units
1" to 5"	1	31" to 32"	12
6" to 12"	2	33" to 34"	13
13" to 14"	3	35" to 36"	14
15" to 16"	4	37" to 38"	15
17" to 18"	5	39" to 40"	16
19" to 20"	6	41" to 42"	17
21" to 22"	7	43" to 44"	18
23" to 24"	8	45" to 46"	19
25" to 26"	9	47" to 48"	20
27" to 28"	10	49" to 50"	21
29" to 30"	11	For larger trees, allow a ½ tree unit for every additional inch of dbh.	

Specific Trees Impacted and Recommendations:

A. Tree # 10974 White Oak
The sidewalk placement will come close to outer edge of the drip line on the the NW side of the root zone. It is likely that roots will be encountered during excavation for sidewalk footing. Assumably the

root size will be < 1” dia at this distance. Any roots encountered will need to be severed cleanly with a sharp pruning tool. The impact on the tree will be negligible.

B. Tree # 20281 White Oak
This trees critical root zone will encroach into the complete Western edge of a home lot by < 5'. This encroachment is not of concern as lot improvements or grading will not happen along the lot line.

C. Tree # 20298 Douglas-fir
The proposed community nature trail will skirt along the N NE edge of the root zone. Impact will be minimal, this tree is part of a collective stand and will receive rescourses from the root network of adjacent trees.

D. Tree # 20299 Douglas-fir
Encroachment is minimal, however this tree has a declining top which can be indicative of decline or environmental stresses such as drought stress, root loss or inhibition of uptake.
This tree may be considered for removal.

E. Tree #'S 20313-20326 Douglas-fir's and White Oak
This group's impact will be beneficial as the existing black top road will be removed during development. Removal of asphalt should be delicate to not disturb the roots just below the asphalt. It is likely that the roots will immediately below the asphalt.
After removal 2-4” of composted mulch needs to be placed over the exposed areas. This placement should happen immediately after asphalt removal so the roots are not exposed to sunlight and air current causing desiccation.

F. Tree # 20326 Douglas-fir
The sidewalk placement will come close to outer edge of the drip line on the the South side of the root zone. It is likely that roots will be encountered during excavation for sidewalk footing. Assumably the root size will be < 1” dia at this distance. Any roots encountered will need to be severed cleanly with a sharp pruning tool. The impact on the tree will be negligible.
Placement of mulch would beneficial during landscaping to prevent desiccation as the tree is at the Southern edge of the stand.

G. Tree # 20343 White Oak
The sidewalk placement will cover < 5' on the outer edge of the drip line on the the SW side of the root zone. It is likely that roots will be encountered during excavation for sidewalk footing. Assumably the root size will be < 1” dia at this distance. Any roots encountered will need to be severed cleanly with a sharp pruning tool. The impact on the tree will be negligible.
This tree's canopy is highly phototropic to the South which mean its canopy may extend beyond its critical root zone. This specimen is also part of a collective oak stand which will receive benefit from the group's root system network.
Placement of mulch would beneficial during landscaping to prevent desiccation as the tree is at the Southern edge of the stand.

Brandon Cheney
ISA Certified Arborist
Tree Risk Assessment Qualified
PN-7163A TRAQ

Sheet1

Tree #	Species	Common Name	DBH"	Tree Units	Retention Y/N	Impacted by development	Health	Comments *see appendix for tree specific conditions of concerns
10937	*fraxinus latifolia*	Ash	7	2	N	N	NA	
10938	*p.menziesii*	Douglas-fir	9	2	Y	N	Satisfactory	
10943	*prunus sp.*	Cherry	11	2	Y	N	Satisfactory	
10944	*p.menziesii*	Douglas-fir	25	9	Y	N	Satisfactory	
10945	*p.menziesii*	Douglas-fir	24	8	Y	N	Satisfactory	
10948	*p.menziesii*	Douglas-fir	14	3	Y	N	Satisfactory	
10949	*p.menziesii*	Douglas-fir	22	7	Y	N	Satisfactory	
10951	*p.menziesii*	Douglas-fir	19	6	Y	N	Satisfactory	
10952	*p.menziesii*	Douglas-fir	22	7	Y	N	Satisfactory	
10954	*p.menziesii*	Douglas-fir	29	11	Y	N	Satisfactory	
10960	*p.menziesii*	Douglas-fir	22	7	Y	N	Satisfactory	
10961	*p.menziesii*	Douglas-fir	29	11	Y	N	Satisfactory	
10964	*p.menziesii*	Douglas-fir	10	2	Y	N	Satisfactory	
10965	*p.menziesii*	Douglas-fir	10	2	Y	N	Satisfactory	
10967	*p.menziesii*	Douglas-fir	23	8	Y	N	Satisfactory	
10968	*p.menziesii*	Douglas-fir	29	11	Y	N	Satisfactory	
10969	*p.menziesii*	Douglas-fir	34	13	N	N		
10970	*p.menziesii*	Douglas-fir	30	11	N	N		
10971	*p.menziesii*	Douglas-fir	26	9	N	N		
10972	*p.menziesii*	Douglas-fir	26	9	N	N		
10973	*p.menziesii*	Douglas-fir	36	14	N	N		
10975	*p.menziesii*	Douglas-fir	28	10	N	N		
10976	*p.menziesii*	Douglas-fir	29	11	N	N		
10977	*p.menziesii*	Douglas-fir	13	3	N	N		
10979	*p.menziesii*	Douglas-fir	14	3	Y	N	Satisfactory	
10980	*p.menziesii*	Douglas-fir	18	5	Y	N	Satisfactory	
11036	*p.menziesii*	Douglas-fir	20	6	Y	N	Satisfactory	
11038	*p.menziesii*	Douglas-fir	15	4	Y	N	Satisfactory	
11040	*p.menziesii*	Douglas-fir	39	16	Y	N	Satisfactory	
11041	*p.menziesii*	Douglas-fir	23	8	Y	N	Satisfactory	
11043	*p.menziesii*	Douglas-fir	7	2	Y	N	Satisfactory	
11044	*p.menziesii*	Douglas-fir	20	6	Y	N	Satisfactory	
11047	*p.menziesii*	Douglas-fir	19	6	Y	N	Satisfactory	

Sheet1

Tree #	Species	Common Name	DBH"	Tree Units	Retention Y/N	Impacted by development	Health	Comments *see appendix for tree specific conditions of concerns
11054	*p.menziesii*	Douglas-fir	40	16	Y	N	Satisfactory	
11058	*p.menziesii*	Douglas-fir	19	6	Y	N	Satisfactory	
11090	*p.menziesii*	Douglas-fir	29	11	Y	N	Satisfactory	
11103	*p.menziesii*	Douglas-fir	15	4	Y	N	Satisfactory	
11116	*p.menziesii*	Douglas-fir	21	7	Y	N	Satisfactory	
11117	*p.menziesii*	Douglas-fir	7	2	Y	N	Satisfactory	
11118	*p.menziesii*	Douglas-fir	24	8	Y	N	Satisfactory	
11129	*fraxinus latifolia*	Ash	7	2	Y	N	Satisfactory	
11130	*p.menziesii*	Douglas-fir	25	9	Y	N	Satisfactory	
20023	*p.menziesii*	Douglas-fir	12	2	Y	N	Satisfactory	
20024	*p.menziesii*	Douglas-fir	10	2	Y	N	Satisfactory	
20041	*p.menziesii*	Douglas-fir	16	4	Y	N	Poor	Dead
20059	*fraxinus latifolia*	Ash	8	2	Y	N	Satisfactory	
20060	*fraxinus latifolia*	Ash	15	4	Y	N	Satisfactory	
20114	*p.menziesii*	Douglas-fir	19	6	Y	N	Satisfactory	
20115	*p.menziesii*	Douglas-fir	22	7	Y	N	Satisfactory	
20117	*p.menziesii*	Douglas-fir	22	7	Y	N	Satisfactory	
20118	*p.menziesii*	Douglas-fir	21	7	Y	N	Satisfactory	
20119	*p.menziesii*	Douglas-fir	19	6	Y	N	Satisfactory	
20120	*p.menziesii*	Douglas-fir	12	2	Y	N	Satisfactory	
10974	*q.garryana*	OR White Oak	24	8	Y	Y	Excelent	Sidewalk outer edge of drip line
10978	*q.garryana*	OR White Oak	38	15	Y	N	Satisfactory	Twin-stem
11060	*q.garryana*	OR White Oak	23	8	Y	N	Satisfactory	
11064	*q.garryana*	OR White Oak	29	11	Y	N	Satisfactory	
11094	*q.garryana*	OR White Oak	16	4	Y	N	Satisfactory	
11119	*q.garryana*	OR White Oak	18	5	Y	N	Satisfactory	
11120	*q.garryana*	OR White Oak	23	8	Y	N	Satisfactory	
11133	*q.garryana*	OR White Oak	43	18	Y	N	Satisfactory	
20025	*q.garryana*	OR White Oak	24	8	Y	N	Satisfactory	
20045	*q.garryana*	OR White Oak	24	8	Y	N	Satisfactory	
20052	*q.garryana*	OR White Oak	26	9	Y	N	Satisfactory	
20070	*q.garryana*	OR White Oak	11	2	Y	N	Satisfactory	

Tree #	Species	Common Name	DBH"	Tree Units	Retention Y/N	Impacted by development	Health	Comments *see appendix for tree specific conditions of concerns
20076	*q.garryana*	OR White Oak	11	2	Y	N	Satisfactory	
20082	*q.garryana*	OR White Oak	18	5	Y	N	Satisfactory	
20092	*q.garryana*	OR White Oak	10	2	Y	N	Satisfactory	
20093	*q.garryana*	OR White Oak	11	2	Y	N	Satisfactory	
20098	*q.garryana*	OR White Oak	14	3	Y	N	Satisfactory	
20113	*q.garryana*	OR White Oak	29	11	Y	N	Satisfactory	
11048	*pinus strobus*	White Pine	8	2	Y	N	Satisfactory	
20301	*p.menziesii*	Douglas-fir	14	3	N		NA	
20303	*p.menziesii*	Douglas-fir	18	5	N		NA	
20304	*p.menziesii*	Douglas-fir	17	5	N		NA	
20305	*p.menziesii*	Douglas-fir	15	4	N		NA	
20277	*fraxinus latifolia*	Ash	7	2	N		NA	
20278	*p.menziesii*	Douglas-fir	39	16	N		NA	
20279	*p.menziesii*	Douglas-fir	33	13	N		NA	
20280	*p.menziesii*	Douglas-fir	37	15	N		NA	
20281	*q.garryana*	OR White Oak	36	14	Y	Y	Excelent	Beyond grading area
20283	*p.menziesii*	Douglas-fir	27	10	Y	N	Satisfactory	
20284	*p.menziesii*	Douglas-fir	22	7	Y	N	Satisfactory	
20290	*q.garryana*	OR White Oak	25	9	Y	N	Satisfactory	
20296	*p.menziesii*	Douglas-fir	27	10	Y	N	Satisfactory	
20297	*p.menziesii*	Douglas-fir	24	8	Y	N	Satisfactory	
20298	*p.menziesii*	Douglas-fir	18	5	Y	Y	Satisfactory	Minimal root zone intrusion
20299	*p.menziesii*	Douglas-fir	26	9	Y	Y	Poor	Dead, Minimal root zone intrusion
20300	*p.menziesii*	Douglas-fir	18	5	N		NA	
20306	*p.menziesii*	Douglas-fir	15	4	N		NA	
20307	*p.menziesii*	Douglas-fir	32	12	N		NA	
20308	*p.menziesii*	Douglas-fir	26	9	N		NA	
20309	*p.menziesii*	Douglas-fir	22	7	N		NA	
20310	*p.menziesii*	Douglas-fir	23	8	N		NA	
20311	*p.menziesii*	Douglas-fir	17	5	N		NA	
20312	*p.menziesii*	Douglas-fir	22	7	N		NA	
20313	*p.menziesii*	Douglas-fir	23	8	Y	Y	Satisfactory	Beneficial impact

Sheet1

Tree #	Species	Common Name	DBH"	Tree Units	Retention Y/N	Impacted by development	Health	Comments *see appendix for tree specific conditions of concerns
20314	*q.garryana*	OR White Oak	56	25	Y	Y	Satisfactory	Multi-Stem, Beneficial
20319	*p.menziesii*	Douglas-fir	12	2	Y	Y	Satisfactory	Beneficial impact
20320	*p.menziesii*	Douglas-fir	8	2	Y	Y	Satisfactory	Beneficial impact
20321	*p.menziesii*	Douglas-fir	18	5	Y	Y	Satisfactory	Beneficial impact
20322	*p.menziesii*	Douglas-fir	19	6	Y	Y	Satisfactory	Beneficial impact
20323	*p.menziesii*	Douglas-fir	8	2	Y	Y	Satisfactory	Beneficial impact
20324	*p.menziesii*	Douglas-fir	9	2	Y	Y	Satisfactory	Beneficial impact
20325	*p.menziesii*	Douglas-fir	28	10	Y	Y	Satisfactory	Beneficial impact
20326	*p.menziesii*	Douglas-fir	27	10	Y	Y	Excelent	Minimal root zone intrusion
20327	*q.garryana*	OR White Oak	38	15	Y	N	Satisfactory	Twin-stem
20328	*q.garryana*	OR White Oak	15	4	Y	N	Satisfactory	Twin-stem
20285	*q.garryana*	OR White Oak	13	3	Y	N	Satisfactory	
20302	*p.menziesii*	Douglas-fir	17	5	N		NA	
20338	*q.garryana*	OR White Oak	19	6	Y	N	Satisfactory	
20343	*q.garryana*	OR White Oak	22	7	Y	Y	Satisfactory	Highly phototropic to S.
20344	*p.menziesii*	Douglas-fir	29	11	Y	N	Satisfactory	
20353	*q.garryana*	OR White Oak	21	7	Y	N	Satisfactory	
20354	*q.garryana*	OR White Oak	25	9	Y	N	Satisfactory	
20355	*q.garryana*	OR White Oak	22	7	Y	N	Satisfactory	
20356	*q.garryana*	OR White Oak	23	8	Y	N	Satisfactory	
20362	*p.menziesii*	Douglas-fir	20	6	N		NA	
20363	*p.menziesii*	Douglas-fir	37	15	N		NA	
20364	*p.menziesii*	Douglas-fir	19	6	N		NA	
20498	*thuja placata*	Western Red Cedar	12	2	N		NA	
20499	*thuja placata*	Western Red Cedar	16	4	N		NA	Twin-stem
20500	*thuja placata*	Western Red Cedar	9	2	N		NA	
20501	*thuja placata*	Western Red Cedar	10	2	N		NA	
20502	*thuja placata*	Western Red Cedar	10	2	N		NA	
20503	*thuja placata*	Western Red Cedar	10	2	N		NA	
20504	*thuja placata*	Western Red Cedar	10	2	N		NA	
20505	*thuja placata*	Western Red Cedar	10	2	N		NA	
20506	*thuja placata*	Western Red Cedar	12	2	N		NA	

Tree #	Species	Common Name	DBH"	Tree Units	Retention Y/N	Impacted by development	Health	Comments *see appendix for tree specific conditions of concerns
20507	*thuja placata*	Western Red Cedar	11	2	N		NA	
20508	*thuja placata*	Western Red Cedar	12	2	N		NA	
20509	*thuja placata*	Western Red Cedar	12	2	N		NA	
20510	*thuja placata*	Western Red Cedar	12	2	N		NA	
20511	*thuja placata*	Western Red Cedar	11	2	N		NA	
20512	*thuja placata*	Western Red Cedar	15	4	N		NA	
20513	*thuja placata*	Western Red Cedar	13	3	N		NA	
20514	*thuja placata*	Western Red Cedar	14	3	N		NA	
20515	*thuja placata*	Western Red Cedar	18	5	N		NA	Twin-stem
20516	*thuja placata*	Western Red Cedar	15	4	N		NA	
20517	*thuja placata*	Western Red Cedar	16	4	N		NA	
10957	*p.menziesii*	Douglas-fir	25	9	Y	N	Satisfactory	
10913	*p.menziesii*	Douglas-fir	25	9	N		NA	
10915	*p.menziesii*	Douglas-fir	20	6	N		NA	
10917	*p.menziesii*	Douglas-fir	22	7	N		NA	
10921	*p.menziesii*	Douglas-fir	27	10	N		NA	
10922	*p.menziesii*	Douglas-fir	13	3	N		NA	
10925	*p.menziesii*	Douglas-fir	27	10	N		NA	
10929	*p.menziesii*	Douglas-fir	35	14	N		NA	
10930	*p.menziesii*	Douglas-fir	11	2	N		NA	
10931	*p.menziesii*	Douglas-fir	24	8	N		NA	
10934	*p.menziesii*	Douglas-fir	20	6	N		NA	
10935	*p.menziesii*	Douglas-fir	28	10	Y	N	Satisfactory	
				999				

EXISTING CONDITIONS SURVEY

IN THE NW 1/4 OF THE SW 1/4
SECTION 21, T. 2 N., R. 3 E., W.M.
CITY OF CAMAS
CLARK COUNTY WASHINGTON

JOB NO. 3927
DATA COLLECT: MARCH 2025
DRAWING DATE: 03-20-2025
SHEET 1 OF 1

LEGEND:

- INDICATES WATER VALVE
- INDICATES FIRE HYDRANT
- INDICATES WATER STAND PIPE
- INDICATES WELL
- INDICATES SANITARY SEWER MANHOLE
- INDICATES SEPTIC SYSTEM LID
- INDICATES POWER POLE WITH DIRECTION OF OVERHEAD LINES
- INDICATES GUY ANCHOR
- INDICATES ELECTRIC METER
- INDICATES TRANSFORMER
- INDICATES HEAT PUMP
- INDICATES GAS VALVE
- INDICATES SIGN
- INDICATES WETLAND FLAG
- INDICATES EVERGREEN TREE WITH TRUNK DIAMETER AND TYPE
- INDICATES DECIDUOUS TREE WITH TRUNK DIAMETER AND TYPE
- INDICATES FIBER OPTIC PEDESTAL
- INDICATES MAIL BOX
- INDICATES BOUNDARY
- INDICATES EDGE OF ASPHALT
- INDICATES EDGE OF CONCRETE
- INDICATES EDGE OF GRAVEL
- INDICATES 5 FOOT INTERVAL CONTOUR
- INDICATES 1 FOOT INTERVAL CONTOUR
- INDICATES FENCE LINE
- INDICATES EDGE OF WATER
- INDICATES PAVE STRIPE
- INDICATES OVERHEAD POWER
- INDICATES TREE DRIP LINE

SCALE 1 INCH = 60 FEET

PLS ENGINEERING

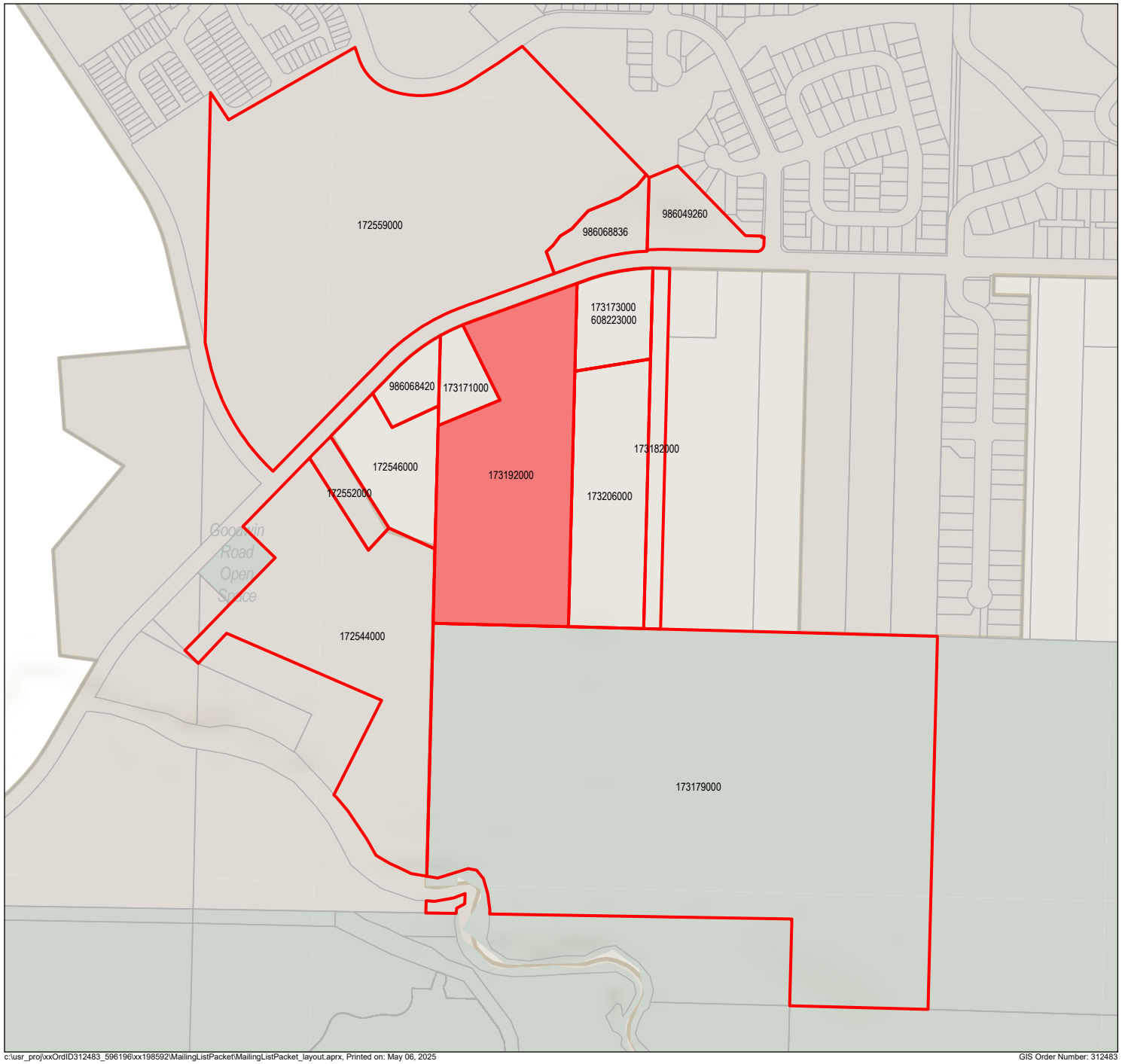
Engineering · Surveying · Planning
604 W. Evergreen Blvd., Vancouver, WA 98660
PH: (360) 944-6519 FAX: (360) 944-6539

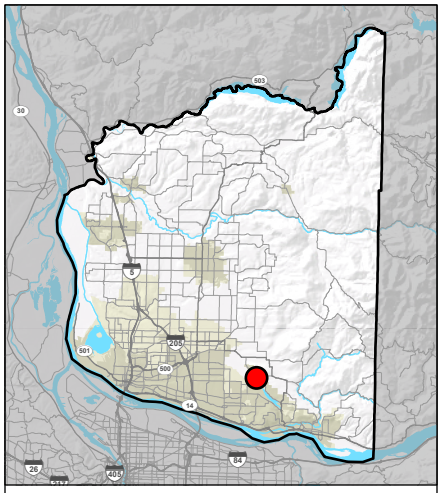
NOTES:

1. THE PURPOSE OF THIS SURVEY WAS TO PREPARE A PLAT. SURVEY RESULTS AND MONUMENTS FOUND THIS IS NOT INTENDED TO BE A BOUNDARY SURVEY. NO PROPERTY CORNERS WERE SET IN THIS SURVEY.
2. NO WARRANTIES ARE MADE AS TO MATTERS OF UNWRITTEN TITLE, SUCH AS ADVERSE POSSESSION, ESTOPPEL, ACQUIESCENCE, ETC.
3. A PRIVATE UTILITY LOCATE WAS CALLED FOR ON 03-26-2025. THE UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE ONLY. UNDERGROUND CONNECTIONS ARE SHOWN AS PER OBSERVED EVIDENCE. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST THAT ARE NOT SHOWN. SOME UNDERGROUND LOCATIONS HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. M.G.S. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS.

HORIZONTAL DATUM:
NAD 83 (2011)
WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, U.S. SURVEY FEET. BASED ON REAL TIME KINEMATIC CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK.

VERTICAL DATUM:
NGVD29(47) CLARK COUNTY DATUM, DERIVED BY WSRN OBSERVATIONS. NAVD88) TO NGVD 29(47)=-3.21'





PID(s): 173192000, 300-Foot Buffer

KEY

- Subject Property
- Buffer Selection
- Parcels

CLARK COUNTY, WASHINGTON

NOTE: *Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.*

N

0 250 500 750 Feet

c:\usr_proj\xxOrdID312483_596196\xx198592\MailingListPacket\MailingListPacket_layout.aprx, Printed on: May 06, 2025

GIS Order Number: 312483

Owner Name	Mailing Address
BAHU MARWAN A	212 SOWING OAK DR, SAN MARCOS, TX, 78666
CHADWICK STEPHANIE L & CHADWICK SCOTT	2619 NE GOODWIN RD, CAMAS, WA, 98607
CITY OF CAMAS	616 NE 4TH AVE, CAMAS, WA, 98607
CLARK COUNTY PARKS	4700 NE 78TH ST, VANCOUVER, WA, 98665
COBURN JAMES A	21715 NE 28TH ST, CAMAS, WA, 98607
COBURN JAMES A	21715 NE 28TH ST #A, CAMAS, WA, 98607
FREESE THAD V & FREESE SALLY KAYE TRUSTEES	2521 NE GOODWIN RD, CAMAS, WA, 98607
GREEN MOUNTAIN PH2 SOUTH HOA	11807 NE 99TH ST STE 1170, VANCOUVER, WA, 98682
HAWRYLO ROBERT S II & HAWRYLO LIDIA TRUSTEES	16758 LA MAIDA ST, ENCINO, CA, 91436
PACIFIC POWER & LIGHT COMPANY	825 NE MULTNOMAH STE 1900, PORTLAND, OR, 97232
SHELDON BARBARA J & MULLINS BRIAN K	21731 NE 28TH ST, CAMAS, WA, 98607
TERRELL & ASSOC LLC ETAL	17933 NW EVERGREEN PL STE 300, BEAVERTON, OR, 97006

This document was created by the Clark County, Washington Geographic Information System

Number of Records 12
Number of Pages 1
Date Created 5/6/2025
Employee
Employee Name Jesse Manley

HAWRYLO ROBERT S II & HAWRYLO LIDIA TRUSTEES
16758 LA MAIDA ST
ENCINO, CA 91436

FREESE THAD V & FREESE SALLY KAYE TRUSTEES
2521 NE GOODWIN RD
CAMAS, WA 98607

HAWRYLO ROBERT S II & HAWRYLO LIDIA TRUSTEES
16758 LA MAIDA ST
ENCINO, CA 91436

TERRELL & ASSOC LLC ETAL
17933 NW EVERGREEN PL STE 300
BEAVERTON, OR 97006

CHADWICK STEPHANIE L & CHADWICK SCOTT
2619 NE GOODWIN RD
CAMAS, WA 98607

COBURN JAMES A
21715 NE 28TH ST #A
CAMAS, WA 98607

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

PACIFIC POWER & LIGHT COMPANY
825 NE MULTNOMAH STE 1900
PORTLAND, OR 97232

BAHU MARWAN A
212 SOWING OAK DR
SAN MARCOS, TX 78666

SHELDON BARBARA J & MULLINS BRIAN K
21731 NE 28TH ST
CAMAS, WA 98607

COBURN JAMES A
21715 NE 28TH ST
CAMAS, WA 98607

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

FREESE THAD V & FREESE SALLY KAYE TRUSTEES
2521 NE GOODWIN RD
CAMAS, WA 98607

CITY OF CAMAS
616 NE 4TH AVE
CAMAS, WA 98607

PID	Situs Address			
172544000	2489 NE GOODWIN RD	CAMAS	WA	98607
172546000	2521 NE GOODWIN RD	CAMAS	WA	98607
172552000			WA	0
172559000			WA	0
173171000	2619 NE GOODWIN RD	CAMAS	WA	98607
173173000	21715 NE 28TH ST	CAMAS	WA	98607
173179000			WA	0
173182000			WA	0
173192000	2625 NE GOODWIN RD	CAMAS	WA	98607
173206000	21731 NE 28TH ST	CAMAS	WA	98607
608223000	21715 NE 28TH ST	CAMAS	WA	98607
986049260			WA	0
986068420			WA	0
986068836			WA	0

This document was created by the Clark County, Washington Geographic Information System

Number of Records 14
Number of Pages 1
Date Created 5/6/2025
Employee
Employee Name Jesse Manley

Occupant PID 172544000
2489 NE GOODWIN RD
CAMAS, WA 98607

Occupant PID 172546000
2521 NE GOODWIN RD
CAMAS, WA 98607

Occupant PID 173171000
2619 NE GOODWIN RD
CAMAS, WA 98607

Occupant PID 173173000
21715 NE 28TH ST
CAMAS, WA 98607

Occupant PID 173192000
2625 NE GOODWIN RD
CAMAS, WA 98607

Occupant PID 173206000
21731 NE 28TH ST
CAMAS, WA 98607

Occupant PID 608223000
21715 NE 28TH ST
CAMAS, WA 98607

ALTA COMMITMENT FOR TITLE INSURANCE

Commitment Number:

612896732
Amendment 3 - Dated Down, updated Taxes, added Note D, Exception #3 (DOT)

issued by agent:

Fidelity National Title
COMPANY OF WASHINGTON, INC.

NOTICE

IMPORTANT - READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and the Commitment Conditions, Fidelity National Title Insurance Company, a Florida corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I-Requirements have not been met within one hundred eighty (180) days after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

Fidelity National Title Insurance Company

By:

Michael J. Nolan, President

Countersigned By:

Phil Archer
Authorized Officer or Agent

Attest:

Marjorie Nemzura, Secretary

This page is only a part of a 2021 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

AMERICAN LAND TITLE ASSOCIATION

FIDELITY NATIONAL TITLE COMPANY OF WASHINGTON, INC.

COMMITMENT NO. 612896732
AMENDMENT 3 - Dated Down, updated Taxes, added Note D, Exception #3 (DOT)

Transaction Identification Data, for which the Company assumes no liability as set forth in Commitment Condition 5.e.:

ISSUING OFFICE:	FOR SETTLEMENT INQUIRIES, CONTACT:
Title Officer: Quincie Matera Fidelity National Title Company of Washington, Inc. 655 W. Columbia Way, Suite 200 Vancouver, WA 98660 Phone: 360-949-0676 Main Phone: (360)750-3686 Email: quincie.matera@fnf.com	Escrow Officer: Jessica Swift Fidelity National Title Company of Washington, Inc. 1499 SE Tech Center Place, Suite 100 Vancouver, WA 98683 Fax: 877-287-8599 Main Phone: (360)256-1400 Email: Jessica.Swift@fnf.com

Order Number: 612896732
Property Address: 2625 NE Goodwin Road, Camas, WA 98607

SCHEDULE A

1. Commitment Date: March 19, 2025 at 08:00 AM

2. Policy to be issued:

   (a) ALTA Owner's Policy 2021 w-WA Mod

Proposed Insured:	Pacific Lifestyle Homes Inc., a Washington corporation	
Proposed Amount of Insurance:	$3,350,000.00	
The estate or interest to be insured:	Fee Simple	
Premium:	$	5,106.00
Tax:	$	444.22
Rate:	Owner Short Term Standard	
Total:	$	5,550.22

   (b) ALTA Loan Policy 2021 w-WA Mod

Proposed Insured:	Lender with contractual obligations under a loan agreement with the vested owner identified at Item 4 below or a purchaser.	
Proposed Amount of Insurance:	$10,000.00	
The estate or interest to be insured:	Fee Simple	
Premium:	$	351.00
Tax:	$	30.54
Rate:	Residential Purchase Loan Rate	
Total:	$	381.54

3. The estate or interest in the Land at the Commitment Date is:

   Fee Simple

4. The Title is, at the Commitment Date, vested in:

   Marwan A. Bahu, as his separate estate

5. The Land is described as follows:

   SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

END OF SCHEDULE A

This page is only a part of a 2021 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

EXHIBIT "A"

Legal Description

For APN/Parcel ID(s): 173192-000

All that portion of Government Lot 3 in Section 21, Township 2 North, Range 3 East of the Willamette Meridian in Clark County, Washington, lying South of the boundary of existing County Road No. 116.

EXCEPT that portion described as follows:

BEGINNING at the intersection of the West line of said Government Lot 3 with the Southerly line of County Road No. 116, a distance of 88 feet to the True Point of Beginning; thence Southwest along the Southerly line of County Road No. 116, a distance of 88 feet to the West line of said Government Lot 3; thence South along said West line 320 feet; thence Northeasterly 238 feet to a point that is 300 feet Southeasterly from the True Point of Beginning; thence Northwesterly 300 feet to the True Point of Beginning.

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

SCHEDULE B, PART I - Requirements

All of the following Requirements must be met:

1. The Proposed Insured must notify the Company in writing of the name of any party not referred to in this Commitment who will obtain an interest in the Land or who will make a loan on the Land. The Company may then make additional Requirements or Exceptions.

2. Pay the agreed amount for the estate or interest to be insured.

3. Pay the premiums, fees, and charges for the Policy to the Company.

4. Documents satisfactory to the Company that convey the Title or create the Mortgage to be insured, or both, must be properly authorized, executed, delivered, and recorded in the Public Records.

5. Additional requirements and/or exceptions may be added as details of the transaction are disclosed to, or become known by the Company.

6. The application for title insurance was placed by reference to only a street address or tax identification number. The proposed Insured must confirm that the legal description in this report covers the parcel(s) of Land requested to be insured. If the legal description is incorrect, the proposed Insured must notify the Company and/or the settlement company in order to prevent errors and to be certain that the legal description for the intended parcel(s) of Land will appear on any documents to be recorded in connection with this transaction and on the policy of title insurance.

7. The Proposed Policy Amount(s) must be increased to the full value of the estate or interest being insured, and any additional premium must be paid at that time. An Owner's policy should reflect the purchase price or full value of the Land. A Loan Policy should reflect the loan amount or value of the property as collateral. Proposed Policy Amount(s) will be revised and premiums charged consistent therewith when the final amounts are approved.

8. For each policy to be issued as identified in Schedule A, Item 2; the Company shall not be liable under this commitment until it receives a designation for a Proposed Insured, acceptable to the Company. As provided in Commitment Condition 4, the Company may amend this commitment to add, among other things, additional exceptions or requirements after the designation of the Proposed Insured.

9. In the event that the Land is occupied or intended to be occupied by the owner and a spouse or registered domestic partner as a homestead, the conveyance or encumbrance of the Land must be executed and acknowledged by both spouses or both registered domestic partners, pursuant to RCW 6.13 which now provides for an automatic homestead on such Land.

10. Possible matters relating to General Exceptions A, B, C and D herein in connection with any extended coverage policy shown in Schedule A to be issued. Adverse matters, if any, will be shown in a supplemental report to this commitment and will be shown as special exceptions in any policy to be issued unless cleared to the satisfaction of the Company.

11. A completed owner's affidavit (form to be supplied by the Company) will be required in connection with issuance of the policy(ies) shown in Schedule A.

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

SCHEDULE B, PART I - Requirements
(continued)

12. The names of the proposed insured were not furnished in the application for title insurance, and when disclosed, the commitment will be subject to such matters as may be found by a search of the records against said names.

    The company reserves the right to add additional items or make further requirements after review of the requested documentation.

13. If documents for this transaction are to be signed using Remote Online Notary, we require the use of company approved RON providers which can be found here: <https://nationalagency.fnf.com/digitalclosinghub/RON-Technology-Providers>.

    The Notarial Certificate must state "This notarial act involved the use of communication technology."

    We require a copy of the notarization video for our file documentation prior to closing. Additional underwriting requirements may need to be satisfied.

14. The Company will require the following documents for review prior to the issuance of any title insurance predicated upon a conveyance or encumbrance from the entity named below.

    Limited Liability Company: Pacific Lifestyle Homes Inc.

    a. A copy of its operating agreement, if any, and any and all amendments, supplements and/or modifications thereto, certified by the appropriate manager or member.

    b. If a domestic Limited Liability Company, a copy of its Articles of Organization and all amendment thereto with the appropriate filing stamps.

    c. If the Limited Liability Company is member-managed a full and complete current list of members certified by the appropriate manager or member.

    d. A current dated certificate of good standing from the proper governmental authority of the state in which the entity was created

    e. If less than all members, or managers, as appropriate, will be executing the closing documents, furnish evidence of the authority of those signing.

    The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

END OF REQUIREMENTS

NOTES

This page is only a part of a 2021 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

SCHEDULE B, PART I - Requirements
(continued)

The following matters will not be listed as Special Exceptions in Schedule B of the policy. There will be no coverage for loss arising by reason of the matters listed below because these matters are either excepted or excluded from coverage or are not matters covered under the insuring provisions of the policy.

Note A: Notice: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.

Note B: Note: The Company finds no matters against the name(s) of Pacific Lifestyle Homes Inc. in the Public Records which would appear as exceptions in the policy.

Note C: Note: The Public Records indicate that the address of the improvement located on said Land is as follows:

2625 NE Goodwin Road
Camas, WA 98607

Note D: Note: The only conveyance(s) affecting said Land, which recorded within 24 months of the date of this report, are as follows:

Grantor:	Lissette Ann Bahu, spouse of grantee herein
Grantee:	Marwan A. Bahu, as his separate estate
Recording Date:	January 24, 2025
Recording No.:	6228834

Note E: Note: FOR INFORMATIONAL PURPOSES ONLY:

The following may be used as an abbreviated legal description on the documents to be recorded, per Amended RCW 65.04.045. Said abbreviated legal description is not a substitute for a complete legal description within the body of the document:

Tax lot #36 Section 21, Township 2 North, Range 3 East
Tax Account No.: 173192-000

Note F: Note: This map/plat is being furnished as an aid in locating the herein described Land in relation to adjoining streets, natural boundaries and other land. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the Company does not insure dimensions, distances or acreage shown thereon.

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

SCHEDULE B, PART I - Requirements
(continued)

Note G: The recording fee (per document) is currently:
Deed $303.50 plus $1.00 for each additional page
Deed of Trust $304.50 plus $1.00 for each additional page

Note: When possible, the company will record electronically and an additional $15.00 fee will apply.

Note: A multiple transaction document incurs an additional fee for each additional title.

Note: A document which fails to conform to certain formatting and page one requirements incurs an additional $50.00 fee.

RECORDING FEES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Please send all recording packages to:
Recording Department
655 W. Columbia Way, Suite 200
Vancouver, WA 98660

Please email all releases to:
ClarkWArecordings@fnf.com

END OF NOTES

END OF SCHEDULE B, PART I

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

SCHEDULE B, PART II - Exceptions

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage.

The Policy will not insure against loss or damage resulting from the terms and conditions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

GENERAL EXCEPTIONS

A. Rights or claims of parties in possession, or claiming possession, not shown by the Public Records.

B. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land.

C. Easements, prescriptive rights, rights-of-way, liens or encumbrances, or claims thereof, not shown by the Public Records.

D. Any lien, or right to a lien, for contributions to employee benefit funds, or for state workers' compensation, or for services, labor, or material heretofore or hereafter furnished, all as imposed by law, and not shown by the Public Records.

E. Taxes or special assessments which are not yet payable or which are not shown as existing liens by the Public Records.

F. Any lien for service, installation, connection, maintenance, tap, capacity, or construction or similar charges for sewer, water, electricity, natural gas or other utilities, or for garbage collection and disposal not shown by the Public Records.

G. Unpatented mining claims, and all rights relating thereto.

H. Reservations and exceptions in United States Patents or in Acts authorizing the issuance thereof.

I. Indian tribal codes or regulations, Indian treaty or aboriginal rights, including easements or equitable servitudes.

J. Water rights, claims or title to water.

K. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the Public Records or is created, attaches, or is disclosed between the Commitment Date and the date on which all of the Schedule B, Part I—Requirements are met.

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

SCHEDULE B, PART II - Exceptions
(continued)

SPECIAL EXCEPTIONS

1. Payment of the real estate excise tax, if required.

The Land is situated within the boundaries of local taxing authority of Clark County.

The rate of real estate excise tax for properties which are not formally classified and specially valued as timberland or agricultural land is:

State portion: 1.10% on any portion of the sales price of $525,000 or less;
1.28% on any portion of the sales price above $525,000, up to $1,525,000;
2.75% on any portion of the sales price above $1,525,000, up to $3,025,000;
3.00% on any portion of the sales price above $3,025,000;

The rate of excise for properties formally classified as timberland or agriculture land will be 1.28% for the State portion on the entire sales price.

Local portion: 0.5% on the entire sales price.

An additional $5.00 State Technology Fee must be included in all excise tax payments.

If the transaction is exempt, an additional $5.00 Affidavit Processing Fee is required.

Any conveyance document must be accompanied by the official Washington State Excise Tax Affidavit, which can be found online HERE <https://dor.wa.gov/get-form-or-publication/forms-subject/real-estate-excise-tax>. The applicable excise tax must be paid and the affidavit approved at the time of the recording of the conveyance documents. (NOTE: Real Estate Excise Tax Affidavits must be printed as legal size forms).

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

SCHEDULE B, PART II - Exceptions
(continued)

2. General and special taxes and charges, payable February 15, delinquent if first half unpaid on May 1, second half delinquent if unpaid on November 1 of the tax year:

Year:	2025
Tax Account No.:	173192-000
School District/Levy Code:	114080
Assessed Total:	$2,387,201.00
Millage Rate:	9.7801203724
Location Code:	0602

General and Special Taxes:

First Half Billed:	$11,696.65
Second Half Billed:	$11,696.50
Unpaid:	$23,393.15

Prior to close of escrow, please contact the Tax Collector's Office to confirm all amounts owing, including current fiscal year taxes, supplemental taxes, escaped assessments and any delinquencies.

3. A deed of trust to secure an indebtedness in the amount shown below,

Amount:	$235,000.00
Dated:	January 23, 2025
Trustor/Grantor:	Marwan A. Bahu, as his separate estate
Trustee:	Fidelity National Title Company of Washington
Beneficiary:	Pacific Lifestyle Homes, Inc., a Washington corporation
Recording Date:	January 24, 2025
Recording No.:	6228835

4. This item intentionally deleted.

END OF SCHEDULE B, PART II

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

COMMITMENT CONDITIONS

1. DEFINITIONS

a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that is unenforceable under applicable law because it illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.

b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.

c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.

d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.

e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.

f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.

g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.

h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.

i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.

j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I-Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

a. the Notice;

b. the Commitment to Issue Policy;

c. the Commitment Conditions;

d. Schedule A;

e. Schedule B, Part I-Requirements; and

f. Schedule B, Part II-Exceptions; and

g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:

i. comply with the Schedule B, Part I-Requirements;

ii. eliminate, with the Company's written consent, any Schedule B, Part II-Exceptions; or

iii. acquire the Title or create the Mortgage covered by this Commitment.

b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.

c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.

This page is only a part of a 2021 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I-Requirements; Schedule B, Part II-Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

(continued)

d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.

e. The Company is not liable for the content of the Transaction Identification Data, if any.

f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I-Requirements have been met to the satisfaction of the Company.

g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.

b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.

c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.

d. The deletion or modification of any Schedule B, Part II-Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.

e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.

f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. CLAIMS PROCEDURES

This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.

10. CLASS ACTION

ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.

11. ARBITRATION - INTENTIONALLY DELETED

END OF CONDITIONS

Copyright American Land Title Association. All rights reserved.

The use of this Form (or any derivative thereof) is restricted to ALTA licensees and ALTA members in good standing as of the date of use. All other uses are prohibited. Reprinted under license from the American Land Title Association.

RECORDING REQUIREMENTS

Effective January 1, 1997, document format and content requirements have been imposed by Washington Law. Failure to comply with the following requirements may result in rejection of the document by the county recorder or imposition of a $50.00 surcharge.

First page or cover sheet:

3" top margin containing nothing except the return address.

1" side and bottom margins containing no markings or seals.

Title(s) of documents.

Recording no. of any assigned, released or referenced document(s).

Grantors names (and page no. where additional names can be found).

Grantees names (and page no. where additional names can be found).

Abbreviated legal description (Lot, Block, Plat Name or Section, Township, Range and Quarter, Quarter Section for unplatted). Said abbreviated legal description is not a substitute for a complete legal description which must also appear in the body of the document.

Assessor's tax parcel number(s).

Return address (in top 3" margin).

**A cover sheet can be attached containing the above format and data if the first page does not contain all required data.

Additional Pages:

1" top, side and bottom margins containing no markings or seals.

All Pages:

No stapled or taped attachments. Each attachment must be a separate page. All notary and other pressure seals must be smudged for visibility. Font size of 8 points or larger.

WIRE SAFE™ | Inquire before you wire!

WIRE FRAUD ALERT

This Notice is not intended to provide legal or professional advice.
If you have any questions, please consult with a lawyer.

All parties to a real estate transaction are targets for wire fraud and many have lost hundreds of thousands of dollars because they simply relied on the wire instructions received via email, without further verification. **If funds are to be wired in conjunction with this real estate transaction, we strongly recommend verbal verification of wire instructions through a known, trusted phone number prior to sending funds.**

In addition, the following non-exclusive self-protection strategies are recommended to minimize exposure to possible wire fraud.

- **NEVER RELY** on emails purporting to change wire instructions. Parties to a transaction rarely change wire instructions in the course of a transaction.
- **ALWAYS VERIFY** wire instructions, specifically the ABA routing number and account number, by calling the party who sent the instructions to you. DO NOT use the phone number provided in the email containing the instructions, use phone numbers you have called before or can otherwise verify. **Obtain the number of relevant parties to the transaction as soon as an escrow account is opened.** DO NOT send an email to verify as the email address may be incorrect or the email may be intercepted by the fraudster.
- **USE COMPLEX EMAIL PASSWORDS** that employ a combination of mixed case, numbers, and symbols. Make your passwords greater than eight (8) characters. Also, change your password often and do NOT reuse the same password for other online accounts.
- **USE MULTI-FACTOR AUTHENTICATION** for email accounts. Your email provider or IT staff may have specific instructions on how to implement this feature.

For more information on wire-fraud scams or to report an incident, please refer to the following links:

Federal Bureau of Investigation:
http://www.fbi.gov

Internet Crime Complaint Center:
http://www.ic3.gov

TM and © Fidelity National Financial, Inc. and/or an affiliate. All rights reserved

FIDELITY NATIONAL FINANCIAL
PRIVACY NOTICE

Effective January 1, 2025

Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF," "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

A limited number of FNF subsidiaries have their own privacy notices. If a subsidiary has its own privacy notice, the privacy notice will be available on the subsidiary's website and this Privacy Notice does not apply.

Collection of Personal Information

FNF may collect the following categories of Personal Information:

- contact information (*e.g.*, name, address, phone number, email address);
- demographic information (*e.g.*, date of birth, gender, marital status);
- identity information (*e.g.,* Social Security Number, driver's license, passport, or other government ID number);
- financial account information (*e.g.,* loan or bank account information);
- biometric data (e.g., fingerprints, retina or iris scans, voiceprints, or other unique biological characteristics; and
- other personal information necessary to provide products or services to you.

We may collect Personal Information about you from:

- information we receive from you or your agent;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

Collection of Browsing Information

FNF automatically collects the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or device:

- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website.

Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

Other Online Specifics

Cookies. When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

Web Beacons. We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

Do Not Track. Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

Links to Other Sites. FNF Websites may contain links to unaffiliated third-party websites. FNF is not responsible for the privacy practices or content of those websites. We recommend that you read the privacy policy of every website you visit.

Use of Personal Information

FNF uses Personal Information for these main purposes:

- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To prevent and detect fraud;
- To maintain the security of our systems, tools, accounts, and applications;
- To verify and authenticate identities and credentials;
- To communicate with you about our, our affiliates', and others' products and services, jointly or independently.
- To provide reviews and testimonials about our services, with your consent.

When Information Is Disclosed

We may disclose your Personal Information and Browsing Information in the following circumstances:

- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to affiliated or nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;
- to affiliated or nonaffiliated third parties with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;
- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

Security of Your Information

We maintain physical, electronic, and procedural safeguards to protect your Personal Information.

Choices With Your Information

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

State-Specific Consumer Privacy Information:

For additional information about your state-specific consumer privacy rights, to make a consumer privacy request, or to appeal a previous privacy request, please follow the link Privacy Request, or email privacy@fnf.com or call (888) 714-2710.

Certain state privacy laws require that FNF disclose the categories of third parties to which FNF may disclose the Personal Information and Browsing Information listed above. Those categories are:

- FNF affiliates and subsidiaries;
- Non-affiliated third parties, with your consent;
- Business in connection with the sale or other disposition of all or part of the FNF business and/or assets;

- Service providers;
- Law endorsement or authorities in connection with an investigation, or in response to a subpoena or court order.

For California Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties, except as permitted by California law. For additional information about your California privacy rights, please visit the "California Privacy" link on our website (fnf.com/california-privacy) or call (888) 413-1748.

For Nevada Residents: We are providing this notice pursuant to state law. You may be placed on our internal Do Not Call List by calling FNF Privacy at (888) 714-2710 or by contacting us via the information set forth at the end of this Privacy Notice. For further information concerning Nevada's telephone solicitation law, you may contact: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: aginquiries@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information or Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes. For additional information about your Oregon consumer privacy rights, or to make a consumer privacy request, or appeal a previous privacy request, please email privacy@fnf.com or call (888) 714-2710

FNF is the controller of the following businesses registered with the Secretary of State in Oregon:
Chicago Title Company of Oregon, Fidelity National Title Company of Oregon, Lawyers Title of Oregon, LoanCare, Ticor, Title Company of Oregon, Western Title & Escrow Company, Chicago Title Company, Chicago Title Insurance Company, Commonwealth Land Title Insurance Company, Fidelity National Title Insurance Company, Liberty Title & Escrow, Novare National Settlement Service, Ticor Title Company of California, Exos Valuations, Fidelity & Guaranty Life, Insurance Agency, Fidelity National Home Warranty Company, Fidelity National Management Services, Fidelity Residential Solutions, FNF Insurance Services, FNTG National Record Centers, IPEX, Mission Servicing Residential, National Residential Nominee Services, National Safe Harbor Exchanges, National Title Insurance of New York, NationalLink Valuations, NexAce Corp., ServiceLink Auction, ServiceLink Management Company, ServiceLink Services, ServiceLink Title Company of Oregon, ServiceLink Valuation Solutions, Western Title & Escrow Company

For Vermont Residents: We will not disclose information about your creditworthiness to our affiliates and will not disclose your personal information, financial information, credit report, or health information to nonaffiliated third parties to market to you, other than as permitted by Vermont law, unless you authorize us to make those disclosures.

Information From Children

The FNF Websites are not intended or designed to attract persons under the age of eighteen (18). We do not collect Personal Information from any person that we know to be under the age of thirteen (13) without permission from a parent or guardian.

International Users

FNF's headquarters is located within the United States. If you reside outside the United States and choose to provide Personal Information or Browsing Information to us, please note that we may transfer that information outside of your country of residence. By providing FNF with your Personal Information and/or Browsing Information, you consent to our collection, transfer, and use of such information in accordance with this Privacy Notice.

FNF Website Services for Mortgage Loans

Certain FNF companies provide services to mortgage loan servicers, including hosting websites that collect customer information on behalf of mortgage loan servicers (the "Service Websites"). The Service Websites may contain links to both this Privacy Notice and the mortgage loan servicer or lender's privacy notice. The sections of this Privacy Notice titled When Information is Disclosed, Choices with Your Information, and Accessing and Correcting Information do not apply to the Service Websites. The mortgage loan servicer or lender's privacy notice governs use, disclosure, and access to your Personal Information. FNF does not share Personal Information collected through the Service Websites, except as required or authorized by contract with the mortgage loan servicer or lender, or as required by law or in the good-faith belief that such disclosure is necessary: to comply with a legal process or applicable law, to enforce this Privacy Notice, or to protect the rights, property, or safety of FNF or the public.

Your Consent To This Privacy Notice; Notice Changes

By submitting Personal Information and/or Browsing Information to FNF, you consent to the collection and use of the information in accordance with this Privacy Notice. We may change this Privacy Notice at any time. The Privacy Notice's effective date will show the last date changes were made. If you provide information to us following any change of the Privacy Notice, that signifies your assent to and acceptance of the changes to the Privacy Notice.

Accessing and Correcting Information; Contact Us

If you have questions or would like to correct your Personal Information, visit FNF's Privacy Request website or contact us by phone at (888) 714-2710, by email at privacy@fnf.com, or by mail to:

Fidelity National Financial, Inc.
601 Riverside Avenue,
Jacksonville, Florida 32204
Attn: Chief Privacy Officer

EXHIBIT "A"

Order No.: 612896732

For APN/Parcel ID(s): 173192-000

All that portion of Government Lot 3 in Section 21, Township 2 North, Range 3 East of the Willamette Meridian in Clark County, Washington, lying South of the boundary of existing County Road No. 116.

EXCEPT that portion described as follows:

BEGINNING at the intersection of the West line of said Government Lot 3 with the Southerly line of County Road No. 116, a distance of 88 feet to the True Point of Beginning; thence Southwest along the Southerly line of County Road No. 116, a distance of 88 feet to the West line of said Government Lot 3; thence South along said West line 320 feet; thence Northeasterly 238 feet to a point that is 300 feet Southeasterly from the True Point of Beginning; thence Northwesterly 300 feet to the True Point of Beginning.

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

Reserve at Green Mountain Subdivision

2. Name of applicant: [help]

Pacific Lifestyle Homes – Nick Edwards

3. Address and phone number of applicant and contact person: [help]

11815 NE 99th Street Suite 1200
Vancouver, WA 98682
360-597-7098

4. Date checklist prepared: [help]

April 16, 2025

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval, likely in early 2026. No phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical Areas Report and Mitigation Plan

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No, the applicant is not aware of any other applications pending for governmental approvals that affect this site.

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type III Subdivision Review*
- *Public notification and staff report publications*
- *Hearing Examiner's Decision*
- *Final engineering plan review and approval*

- *Final Plat Approval*
- *SEPA*
- *SWWPPP - Stormwater Pollution Prevention Plan*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes a 38-lot single family residential subdivision in the R-7.5 zone on 11.31 acres. Public roads will be constructed that will connect into NE 28th Street and end in a cul-de-sac at the south end of the site.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 2625 NE Goodwin Rd. Camas, WA 98607, in the SW 1/4 of Section 21, Township 2 North, Range 3 East of the Willamette Meridian. The site is identified as Tax Parcel 173192000. See the proposed development plans for a preliminary plat, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

10%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site consists of:
CvA – Cove silty clay loam (0-3% slopes)
DoB – Dollar loam (0-5% slopes)
LrC – Lauren gravelly loam (3-15% slopes)
MlA – McBee silt loam (0-3% slopes)

It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of public roads, driveways, the installation of utilities, and the preparation of the site for single family residential housing. Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time; these will be established with the Final Engineering Plans.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 50%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal household activities, possibly including wood burning stoves and fireplaces.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are off-site sources of emissions from cars that travel adjacent roads. This will not affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

Per the Critical Areas Report for the site there is an onsite Category II wetland along the west portion of the property as well as an offsite Category II wetland southeast of the site. There is an un-named non-fish bearing stream in the southeast corner of the site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

Yes, the stormwater facility and portions of lots 21-25 and a shared private drive will be located within 200' of the waters.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

None, no impacts are proposed to the wetland or stream.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. A storm detention pond is proposed with the site development that will discharge stormwater into the nearby wetland. Storm water from pollution generating surfaces will be treated prior to being routed to the storm detention pond.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural;

etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will be runoff from impervious roof area, driveways, roadways, and landscaped areas. Street catch basins, yard drains, and roof drains will connect to a pipe network that leads to the detention pond.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

The contractor will be required to use approved erosion control measures during all phases of development in order to reduce or control runoff.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, maple, aspen, **other: Oregon white oak, ash, hazelnut**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
____ grass
x pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
x other types of vegetation: **blackberry, vine maple, snowberry, dogwood, salmonberry, sword fern, piggy-back plant, lanceleaf spring beauty, dovefoot geranium, large leaf avens, slough sedge.**

b. What kind and amount of vegetation will be removed or altered? [help]

Much of the site vegetation will be stripped for site preparation. Trees along the south portion of the site are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There are priority habitat Oregon white oaks onsite.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Street trees and landscaping will be provided throughout the park and open space areas. All Oregon white oaks will be preserved.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:
birds: **hawk**, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The future homes will likely be landscaped with grass lawns and appealing native shrubs and trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The new homes on the site will be served primarily by electricity and natural gas. Wood stoves might be used for heating. Other forms of energy will depend on homeowners.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The new homes will have energy-efficient windows and will comply with the state building codes which includes conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

There are no known environmental health hazards that could occur as a result of this proposal.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.25 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

None known

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

None known

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a residential area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

None

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads exist in the area, along with typical household noises. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises from this project will include construction noises which would occur only during approved hours as mandated by City of Camas and Washington State. Long-term noises could include an increase in traffic noise and normal household noises.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City of Camas.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has an existing single-family residence and an outbuilding. To the south is Camp Currie, park land owned by Clark County. To the east and the west of the site are single family homes on larger lots. To the north is vacant land.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

The Critical Areas Report for the site states that the site has a history of horse grazing. It is unknown whether the site has a history of being used as working farmlands or forest lands.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

One single-family residence and one outbuilding exist onsite.

d. Will any structures be demolished? If so, what? [help]

The existing home will remain; the outbuilding will be demolished.

e. What is the current zoning classification of the site? [help]

R7.5 – Residential

f. What is the current comprehensive plan designation of the site? [help]

SFM

g. If applicable, what is the current shoreline master program designation of the site? [help]

The SW corner of the site falls within the Urban Conservancy Shoreline Designation.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There are wetlands, a stream and Oregon white oaks on site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that this development will contain 38 lots/homes. At 2.8 people per household, there will be a total of approximately 107 people residing within this development at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

None.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

This project will not displace any people.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

There are no known impacts.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

37 new homes are proposed, one existing home will remain. The type of proposed housing is unknown at this time.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

No units will be eliminated.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new home construction will meet City of Camas building codes for residential housing development and not exceed height limits of 35'. Exterior building materials are unknown.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from a large-lot single family residence to a development with 38 single family homes.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The future single-family homes will be landscaped with grass lawns and other appealing landscaping. The main roadway frontage will be landscaped with trees per the City of Camas roadway standards. Large opens spaces and many onsite trees are proposed to be retained within the development.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When homes are constructed on the proposed lots, there will most likely be light produced from houses, yards, and street lights during evenings and early mornings.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Shielding of porch lights and streetlights will reduce light and glare impacts offsite.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camp Currie park is adjacent to the south, Lacamas Heritage Trail and Camas Meadows Golf Club are located to the southwest.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

The applicant proposes to pay all park impact fees associated with building permits. A 3.94-acre open space tract (Tract F) is proposed with picnic tables and trails that will provide recreation opportunities onsite.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

The existing single-family home is older than 45 years old, but it is unlikely that it would be eligible for national, state, or local preservation registers per the archaeological predetermination report.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

There are no known landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site. An Archaeological Predetermination Survey was performed by Archaeological Services, LLC for onsite work. The onsite study found no cultural materials.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, no further archaeological work is needed. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

Access to the site will be from NE 28th Street abutting the north side of the site. New residential roads will be constructed to serve the development. Proposed street layouts are shown on the preliminary plat.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is the Fishers Landing Transit Center approximately 6 miles to the southwest.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

Approximately 2-4 parking spaces per single-family home are proposed. This project will eliminate approximately 4 parking spaces with the removal of the existing home. Street parking will be allowed on both sides of the proposed residential roadway.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 28th Street up to half-width roadway standards. The construction of this project also proposes to construct internal public roadways to serve the proposed lots and provide circulation to potential future developments. See the preliminary plat for proposed roadway alignments.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

It is anticipated that 310 trips per day would be generated by the project. It is expected that 23 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 31 trips will occur in the PM peak hour (4:00 – 6:00).

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development and the construction of new homes will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for schools, traffic, and parks at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer,

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signed by:
Signature: Nick Edwards
B4B8362C57AF4B0...
Name of signee Nick Edwards
Position and Agency/Organization Land Entitlements Project Manager Lifestyle Homes
Date Submitted: 5/22/2025

Reserve at Green Mountain

Located in the SE ¼ of Section 21, T2N, R3E and in
the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

APPLICANT:
Pacific Lifestyle Homes
11815 NE 99th Street
Vancouver, WA 98682
(360) 304-9901

OWNER:
Marwan Bahu
PO Box 744
San Clemente, CA 92672

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173192-000
2625 NE GOODWIN RD
Camas, WA 98607

LAND USE:
The applicant is proposing a 38 lot subdivision in the R7.5 zone utilizing the density transfer standards.

Existing Lot area = 11.31 AC
Proposed open space = 4.35 AC
Minimum Proposed Lot Area = 4,541 sq-ft
Maximum Propsed Lot Area = 12,256 sq- ft
Average Lot Area = 5,824 sq-ft
Min. Lot Width = 45'

Maximum Density = 5.8 d.u./net acre (43 lots)
Proposed Density = 5.4 d.u./net acre (38 lots)

TRANSPORTATION:
Primary access to the site is provided from NE Goodwin Road/NE 28th Street. Frontage improvements along this street will include additional right-of-way and pavement to meet the requirements for a 3-Lane Arterial. No lots will have direct vehicular access to NE Goodwin Road/NE 28th Street.

The internal public streets will be constructed according to standard detail number ST3. These streets will generally provide a 28'wide paved road within a 52' right-of-way with 5' sidewalks and 5' planter strips on each side.

UTILITIES:
Stormwater runoff is proposed to be collected and routed to a detention facility located on the south end of the site. Runoff generated from pollution generating surfaces will be treated using filter cartridges prior to entering the stormwater facilities.

The site will be served by public water and sanitary sewer provided by the City of Camas. The connection point for both water and sewer are within NE 28th Street. Due to the existing grade of the site that slopes away from NE 28th Street, a majority of the lots will need to utilize a grinder pump system.

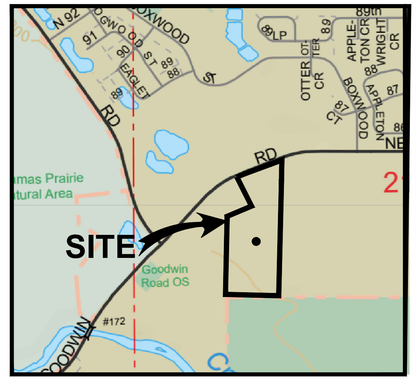
TRACT OWNERSHIP:
All tracts will be privately owned and maintained by the Homeowners Association (HOA) or individual homeowners, including the stormwater facility. The City will be granted an access easement to the storm facility for purposes of inspections.

ENVIRONMENTAL CONSTRAINTS:
There are multiple Oregon white oak trees located on or near the site. There is also a wetland and stream present on site. The shoreline of Lacamas Creek extends on to the SW corner of the site and includes the onsite wetland area. Buffer reduction, averaging, and enhancement are proposed for impacts to wetland buffers. All onsite oak trees are proposed to be retained. There are no direct impacts to the onsite wetland and associated shoreline.

There are no onsite areas within 100-year floodplain, no landslide or erosion hazard areas, and no known significant historic resources.

Proposed Setbacks	*PROPOSED*
Front Yard	*15'*
Side Yard	*5'*
Rear Yard	*15'*
Garage	*20'*
Side Yard flanking a street	*10'*

SITE STATISTICS		
ZONE: R7.5		
Site Area	*492,832 SQ FT*	*11.31 AC*
Infrastructure Area	*28,707 SQ FT*	*0.66 AC*
Right of Way Dedication	*3,017 SQ FT*	*0.07 AC*
Tract A	*3,559 SQ FT*	*0.08 AC*
Tract B	*2,213 SQ FT*	*0.05 AC*
Tract C	*1,392 SQ FT*	*0.03 AC*
Tract D	*5,506 SQ FT*	*0.12 AC*
Open Space	*189,529 SQ FT*	*4.35 AC*
Tract E	*1,434 SQ FT*	*0.03 AC*
Tract F	*184,716 SQ FT*	*4.24 AC*
Tract G	*3,379 SQ FT*	*0.08 AC*
Net Area (Site Area - Open Space)	*303,303 SQ FT*	*6.96 AC*
Total Lots	*38*	
Critical Areas	*171,603 SQ FT*	*3.94 AC*
	REQUIRED	*PROPOSED*
Density (Net Acreage/Total Lots)	*5.8 Max*	*5.4*
Maximum Building Lot Coverage	*40%*	*55%*
Single Story Homes	*-*	*55%*
Two Story Homes	*-*	*50%*

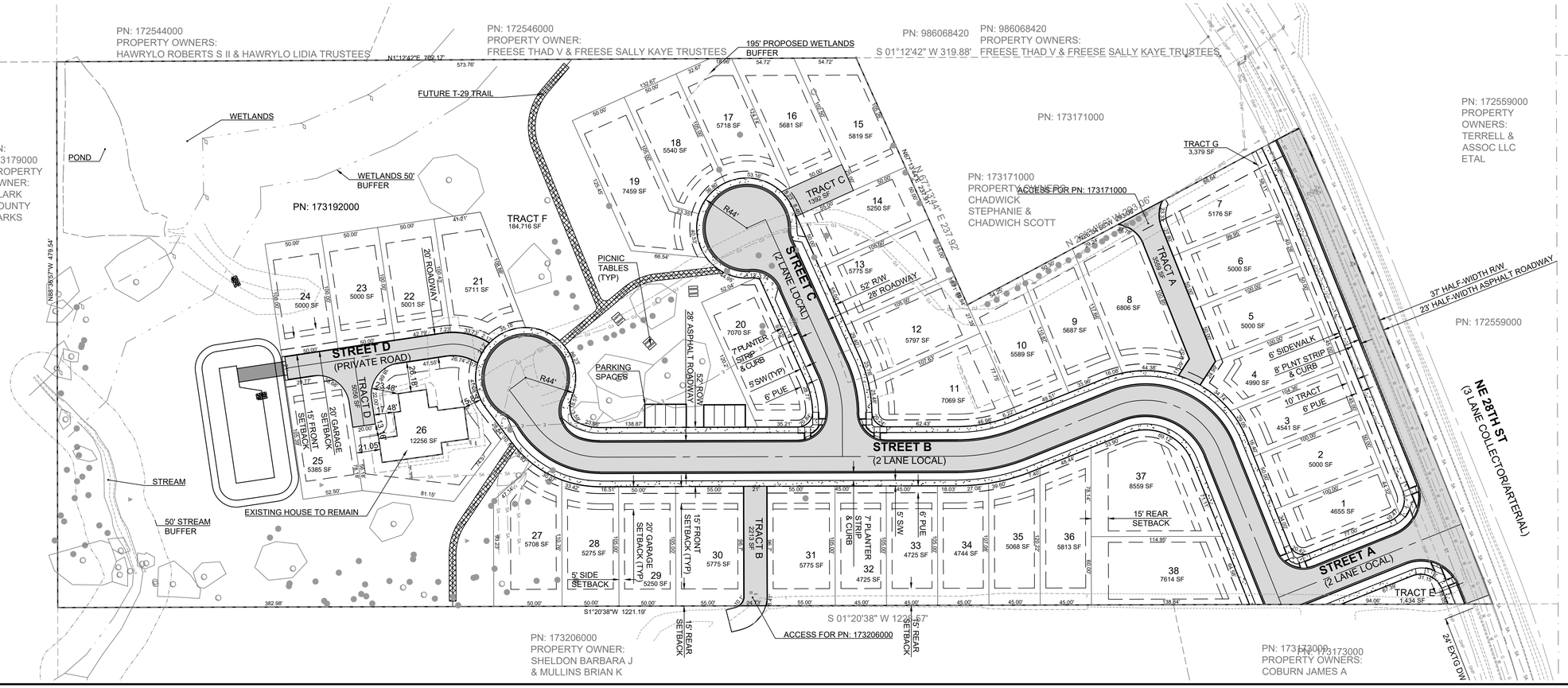


VICINITY MAP
NOT TO SCALE

Legend

- *Proposed Asphalt Concrete*
- *Proposed Cement Concrete*
- *Proposed Wood Chips*
- *Proposed Gravel*

Scale 1" = 50'
50 25 0 50



Preliminary Plat For:

Reserve at Green Mountain

A Subdivion Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

PLS ENGINEERING

Revisions

1	2	3	4	5	6

Project No. 3927	
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	CHJ
DRAFTED BY:	CHJ
REVIEWED BY:	TGJ

2
6

Reserve at Green Mountain

Located in the SE ¼ of Section 21, T2N, R3E and in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

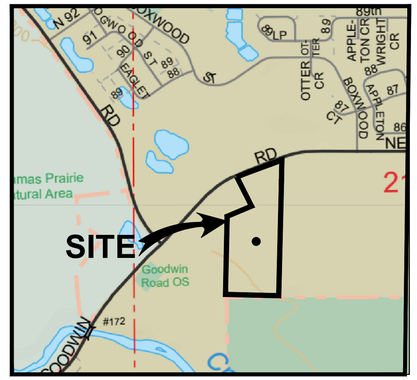
APPLICANT:
Pacific Lifestyle Homes
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Marwan Bahu
PO Box 744
San Clemente, CA 92672

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173192-000
2625 NE GOODWIN RD Camas, WA 98607

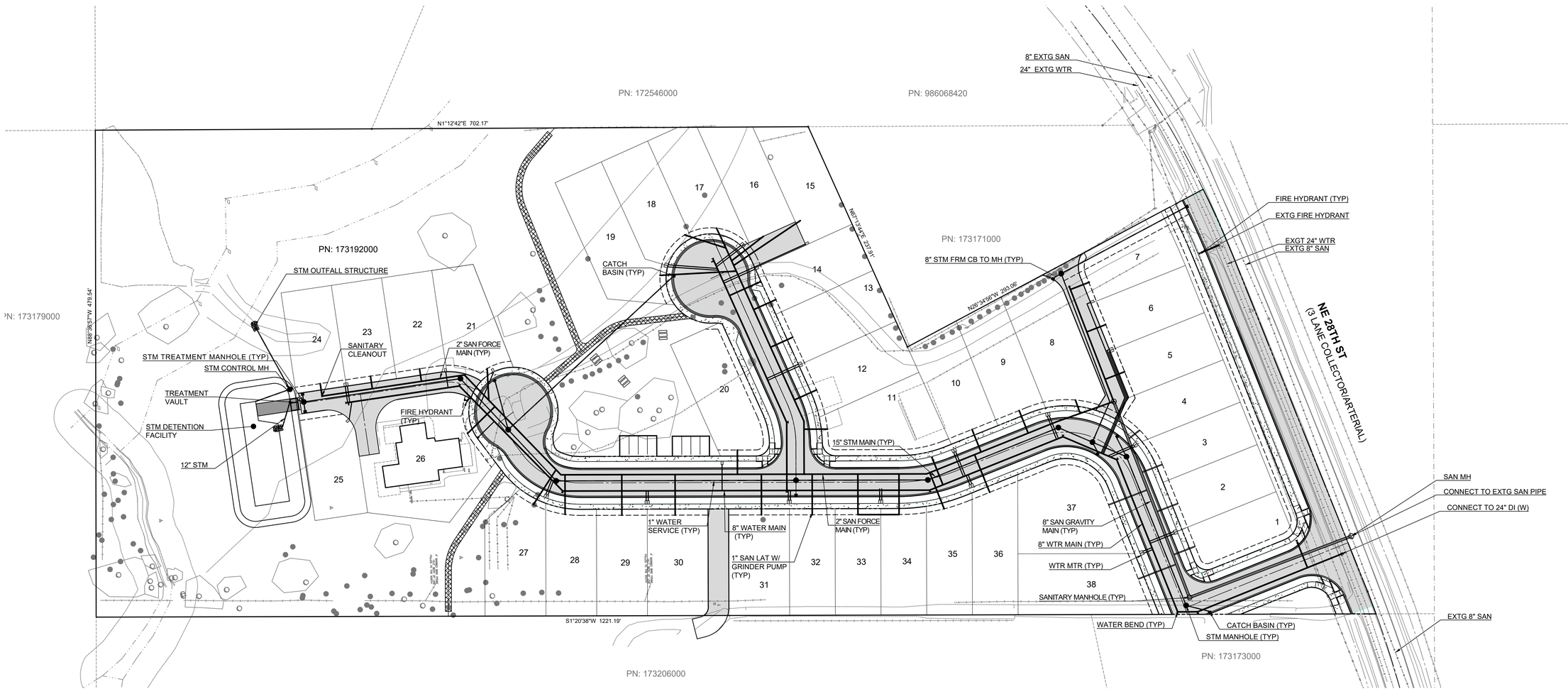
Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Wood Chips	
Proposed Gravel	



VICINITY MAP
NOT TO SCALE

UTILITY PIPE SIZING NOTE:
The utility pipe sizes listed are for preliminary purposes only, and are subject to change as part of the final design.

Scale 1" = 50'
50 25 0 50



ENGINEERING | PLS

Utility Plan For:
Reserve at Green Mountain
A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6

Project No.	3927
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	CHJ
DRAFTED BY:	CHJ
REVIEWED BY:	TGJ

3
6

Reserve at Green Mountain

Located in the SE ¼ of Section 21, T2N, R3E and in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

APPLICANT:
Pacific Lifestyle Homes
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Marwan Bahu
PO Box 744
San Clemente, CA 92672

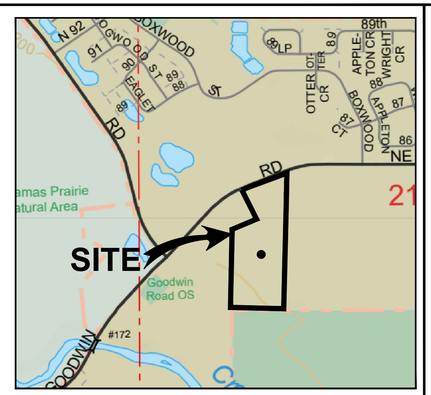
CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173192-000
2625 NE GOODWIN RD Camas, WA 98607

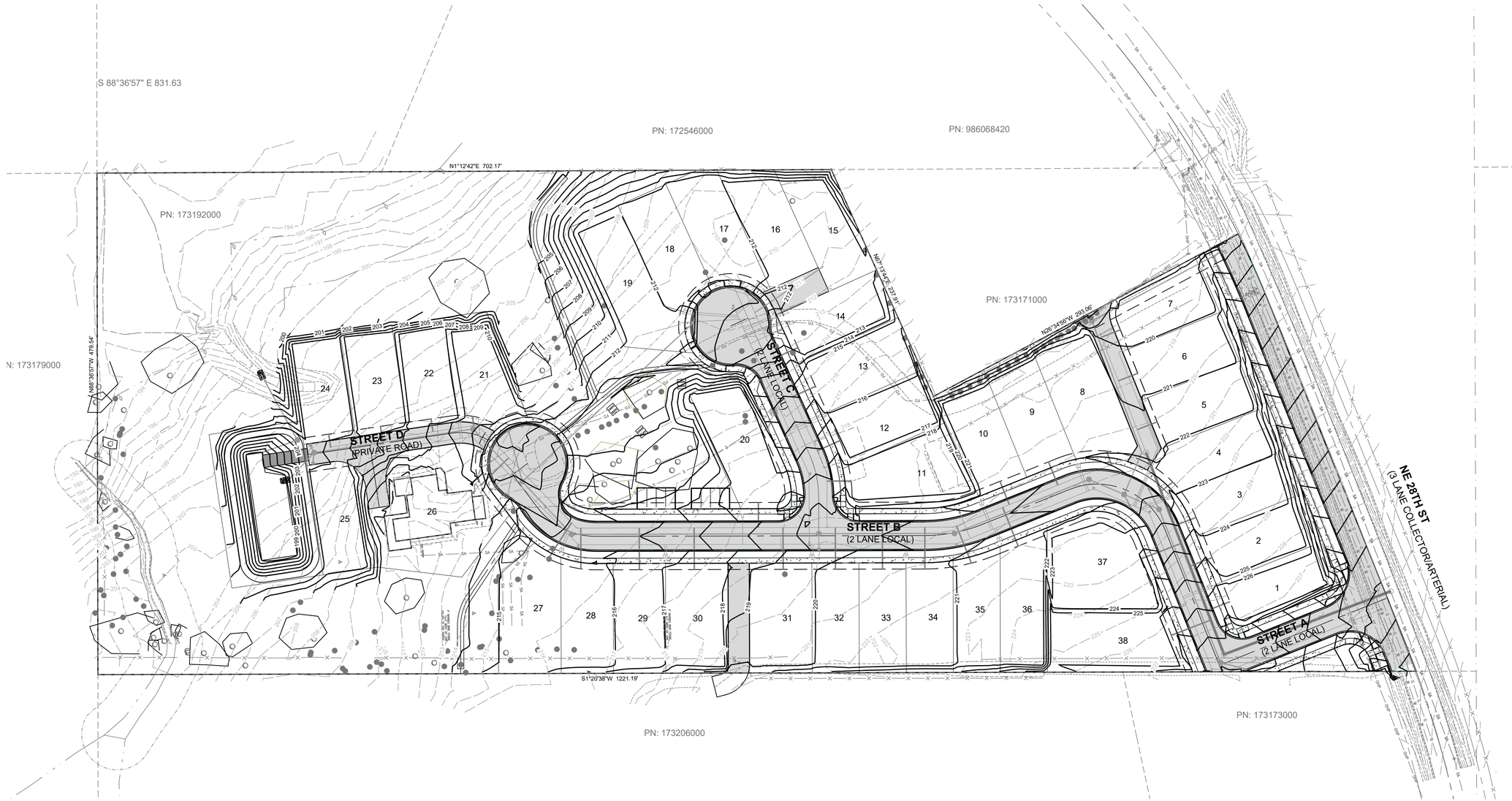
Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Wood Chips	
Proposed Gravel	

UNADJUSTED VOLUMES	
CUT	6,474 CY
FILL	10,820 CY

Scale 1" = 50'
50 25 0 50



VICINITY MAP
NOT TO SCALE



Grading Plan For:
Reserve at Green Mountain
A Subdivision Located In The City Of Camas, Washington

ENGINEERING | PLS

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6

Project No.	3927
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	CHJ
DRAFTED BY:	CHJ
REVIEWED BY:	TGJ

4
6

Reserve at Green Mountain

Located in the SE ¼ of Section 21, T2N, R3E and in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

HORIZONTAL DATUM:
NAD 83 (2011)
Oregon State plane coordinate system, North zone, International feet based on real time kinematic corrections from the Washington State reference network.

VERTICAL DATUM:
NGVD29(47) Clark County Datum

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

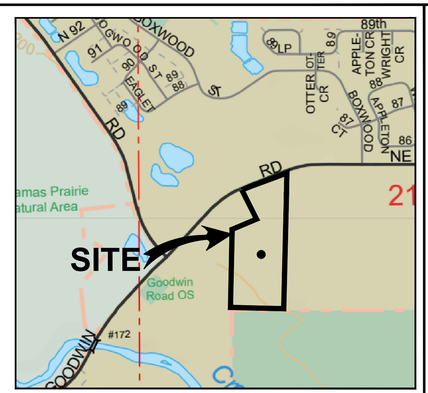
OWNER:
Marwan Bahu
PO Box 744
San Clemente, CA 92672

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173192-000
2625 NE GOODWIN RD
Camas, WA 98607

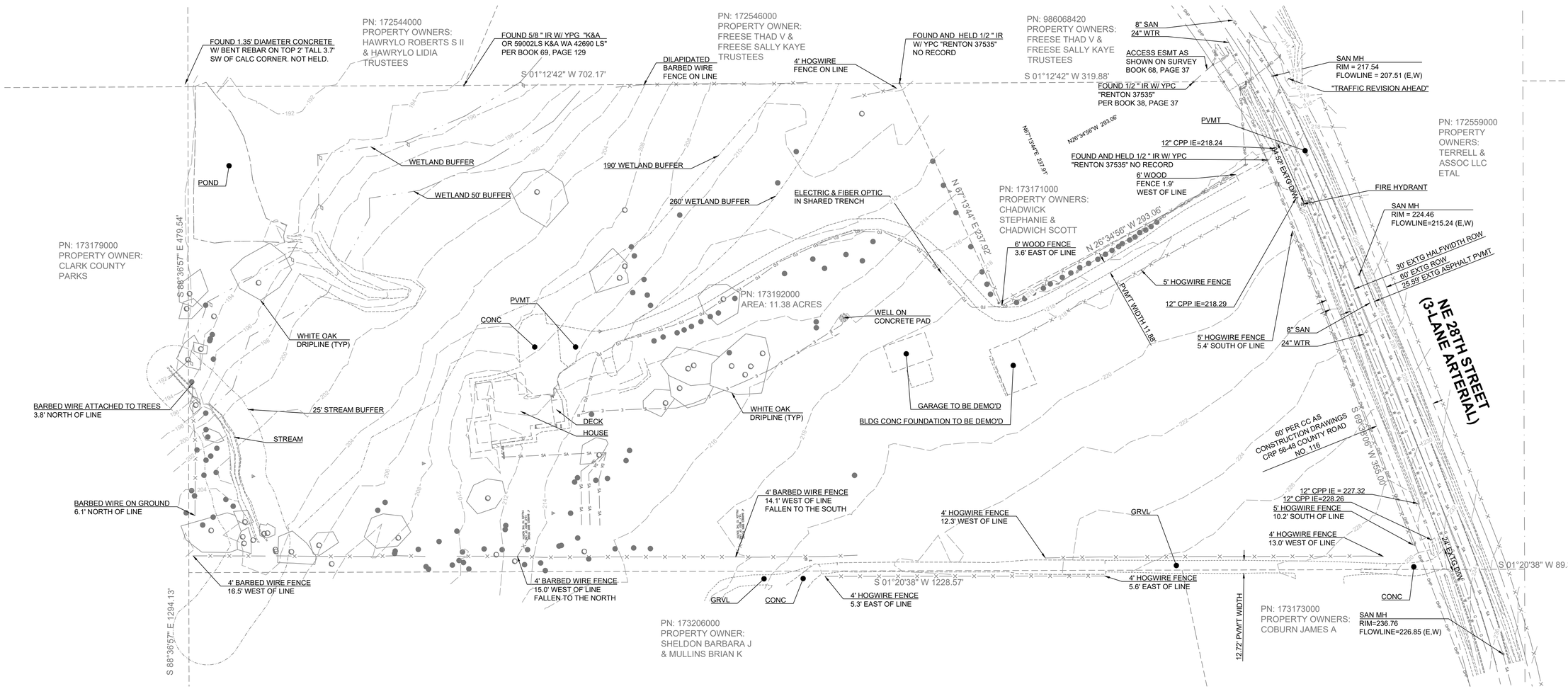
Sheet Index

1. Existing Conditons
2. Preliminary Plat
3. Utility Plan
4. Grading Plan
5. Landscape Plan
6. Landscape Plan



VICINITY MAP
NOT TO SCALE

Scale 1" = 50'
50 25 0 50



ENGINEERING | PLS

Existing Conditions Plan For:

Reserve at Green Mountain

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6	

Project No. 3927	
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	CHJ
DRAFTED BY:	CHJ
REVIEWED BY:	TGJ

1
6

REQUIRED TREE DENSITY

	SITE AREA	REQUIRED TREE UNITS / ACRE DISTURBED	TOTAL REQUIRED TREE UNITS
	11.3± AC	20	226

TREE DENSITY SUMMARY

EXISTING TREE UNITS RETAINED	673
TREE UNITS PROPOSED TO PLANT	81
TREE UNITS PROVIDED	754

PLANT LEGEND

SYMBOL	BOTANICAL / COMMON NAME	SIZE	QUANTITY	TREE UNITS
TREES				
	EXISITNG TREES - RETAIN & PROTECT PER PLANS.	SEE TREE REPORT		673
	ACER TRUNC. X A. PLAT.'WARREN RED' PACIFIC SUNSET MAPLE FINAL LOCATIONS PER FINAL DRIVEWAY LOCATIONS	2" cal.	18	18
	CALOCEDRUS DECURRENS INCENSE CEDAR	5' Ht.	7	7
	CARPINUS CAROLINIANA AMERICAN HORNBEAM FINAL LOCATIONS PER FINAL DRIVEWAY LOCATIONS	2" cal.	15	15
	PARROTIA PERSICA 'VANESSA' VANESSA PERSIAN PARROTIA	2" cal.	23	23
	ZELKOVA SERRATA 'CITY SPRITE' CITY SPRITE ZELKOVA	2" cal.	18	18
	TOTAL TREES PLANTED		81	
	TOTAL TREE UNITS			754
SHRUBS				
	MYRICA CALIFORNICA PACIFIC WAX MYRTLE	5 GAL.	21	
	MAHONIA AQUIFOLIUM OREGON GRAPE	5 GAL.	9	
GROUNDCOVER				
	ARCTOSTAPHYLOS UVA URSI / KINNIKINNICK	1 GAL.	36" O.C.	
	LAWN, DROUGHT RESISTANT, SUN & SHADE MIX (ALL NON SHRUB OR GC AREAS)			
STORMWATER DETENTION FACILITY				
	GRASS SEED PER CIVIL PLANS			
CRITICAL AREAS MITIGATION				
	REFER TO MITIGATION PLAN PREPARED BY ASH ECO SOLUTIONS, INC.			

*CONFIRM QUANTITIES WITH CRITICAL AREAS MITIGATION PLAN



IRRIGATION NOTE

ALL LANDSCAPE AREAS SHALL BE HAND WATERED OR IRRIGATED WITH AN AUTOMATIC DRIP AND/OR SPRAY IRRIGATION SYSTEM. REFER TO CIVIL ENGINEERING PLANS FOR WATER SOURCE.

REFER TO SHEET L2 FOR PLANTING DETAILS AND NOTES

Planning Solutions, Inc.
Creating Solutions to Complex Issues
4400 NE 77th Avenue
Suite 275
VANCOUVER, WA 98662
VOICE: 360-750-9000 FAX: 360-713-6102
www.planningsolutionsinc.com

STATE OF WASHINGTON · CHRISTOPHER A. BALMELLI · LICENSED LANDSCAPE ARCHITECT · PRELIMINARY NOT FOR CONSTRUCTION SUBJECT TO APPROVAL

RESERVE AT GREEN MOUNTAIN

2625 NE Goodwin Road
Camas, Washington

DRAWN: VH | CHECKED: CB
SCALE: 1" = 50'-0" | DATE: 05.16.25
JOB #: 25-1967
ISSUED FOR: PLR
REVISIONS:
1
2
3
4
5
6

SHEET NAME:
PRELIMINARY LANDSCAPE PLAN

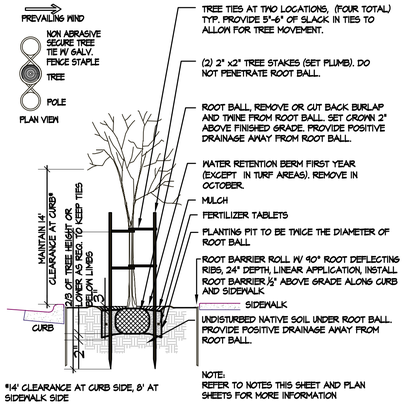
SHEET #: L1

SHEET 1 OF 2

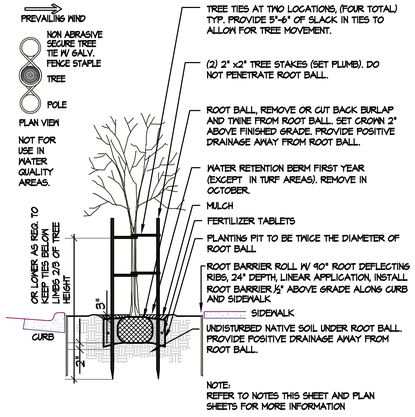
© COPYRIGHT 2025, PLANNING SOLUTIONS, INC. NO PART OF THIS DRAWING MAY BE COPIED OR REPRODUCED WITHOUT WRITTEN PERMISSION OF PLANNING SOLUTIONS, INC.

DISCLAIMER AND LIMITATIONS: ANY WORK CONTAINED HEREIN INCLUDING BUT NOT LIMITED TO PLANS AND DOCUMENTS ARE INSTRUMENTS OF SERVICE INTENDED FOR USE SOLELY WITH RESPECT TO THIS PROJECT. ALL WORK SHALL BE CONSIDERED CONCEPTUAL AND SUBJECT TO CHANGE. THESE INSTRUMENTS OF SERVICE SHALL BE CONSIDERED A WORK IN PROGRESS WHERE UNKNOWN FACTORS EXIST AND JURISDICTIONAL REQUIREMENTS HAVE NOT BEEN VERIFIED. DUE TO THE HIGH DEGREE OF UNCERTAINTY ASSOCIATED WITH A CONCEPTUAL DESIGN, THESE INSTRUMENTS OF SERVICE SHALL NOT BE USED AS THE BASIS FOR A FINANCIAL EVALUATION OR CONSTRUCTION COST ESTIMATING. NO ASSURANCES ARE OFFERED OR IMPLIED AS TO THE OVERALL FEASIBILITY OF THE PROJECT. ALL WORK SHALL BE SUBJECT TO REVIEW AND FINAL APPROVAL BY ALL APPROPRIATE FEDERAL, STATE AND LOCAL AGENCIES AND SHALL CONTAIN THE PROFESSIONAL SEAL AND SIGNATURE OF ALL REQUIRED DESIGN PROFESSIONALS PRIOR TO ANY USE OF THESE DOCUMENTS. PLANNING SOLUTIONS, INC. AND ITS CONSULTANTS SHALL BE DEEMED THE AUTHORS AND OWNERS OF THEIR RESPECTIVE INSTRUMENTS OF SERVICE AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS.

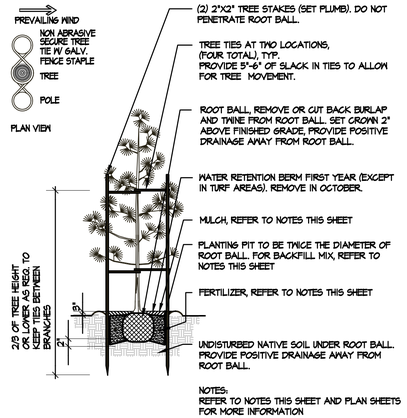
Exhibit 15 SUB25-1004



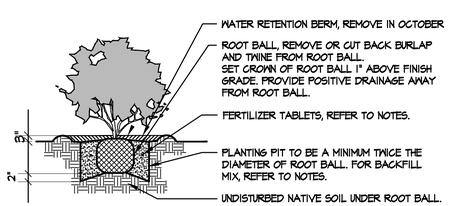
A B & B Tree Planting - Street Tree Detail
Not To Scale — SECTION / PLAN VIEW



B B & B Tree Planting Detail
Not To Scale — SECTION / PLAN VIEW

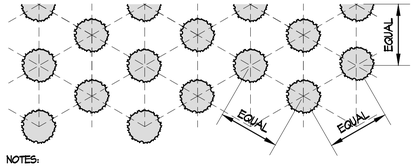


C B & B Tree Planting Detail: Evergreen under 8' Height
Not To Scale — SECTION / PLAN VIEW



NOTE:
REFER TO NOTES AND PLANS PRIOR TO BIDDING AND CONSTRUCTION.

D B & B Shrub Planting Detail
Not To Scale — SECTION



NOTES:

ALL GROUND COVER SHALL BE PLANTED AT EQUAL TRIANGULAR SPACING AS SPECIFIED IN PLANTING LEGEND.

GROUND COVER TO BE LOCATED ONE HALF OF SPECIFIED SPACING DISTANCE FROM ANY HARD SURFACE, UNLESS OTHERWISE SPECIFIED.

E Ground Cover Planting Detail
Not To Scale — PLAN VIEW

PLANTING NOTES

1. ALL BOUNDARIES, EASEMENTS, UTILITIES AND LEGAL ENCUMBRANCES TO BE CONFIRMED WITH OWNER PRIOR TO BEGINNING WORK. PROPERTY LINES AND SURVEY INFORMATION PROVIDED BY PLS ENGINEERING.
2. IN NO WAY IS THIS PLAN TO BE INTERPRETED TO EXCEED THE LEGAL BOUNDARIES OF THE OWNER'S REAL PROPERTY.
3. THE LANDSCAPE DESIGNER ASSUMES NO RESPONSIBILITY FOR THE LOCATION OF BOUNDARIES, UTILITIES AND WETLANDS.
4. THIS PLAN SHALL BE INSTALLED TO MEET ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL CODES.
5. THIS PLAN SHALL BE CONSIDERED PRELIMINARY UNTIL APPROVED BY ALL GOVERNING AGENCIES. IMPLEMENTATION OF THIS PLAN SHALL NOT PROCEED UNTIL ISSUANCE OF ALL RELATED PERMITS.
6. PLANT QUANTITIES ARE FOR INFORMATION ONLY. IN CASE OF ANY DISCREPANCY, THE PLAN SHALL GOVERN.
7. ALL WORK IS TO BE PERFORMED BY LICENSED CONTRACTORS AND EXPERIENCED WORKERS.
8. THE CONTRACTOR IS TO VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES PRIOR TO PERFORMING ANY EXCAVATION. CONTRACTOR SHALL REPAIR ANY DAMAGE TO UTILITIES CAUSED BY THE CONTRACTOR'S WORK, AT NO ADDITIONAL COST TO THE OWNER. CONTACT ALL UTILITY PROVIDERS SERVING THE SITE AREA 48 HOURS PRIOR TO ANY EXCAVATION.
9. ALL PLANT MATERIALS SHALL MATCH SPECIFICATIONS PER SPECIES AND SHALL COMPLY WITH ANSI Z60.1 'STANDARD FOR NURSERY STOCK'.
10. THE CONTRACTOR SHALL ADHERE TO THE WASHINGTON ASSOCIATION OF NURSERYMEN'S GUIDELINES FOR PLANTING PRACTICES.
11. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING ELEMENTS ON AND OFF SITE, RESULTING FROM THE CONTRACTOR'S WORK.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE VIABILITY OF ALL PLANT MATERIAL FOR 2 YEARS AFTER COMPLETION OF PLANTING. DISEASED, DYING, OR DEAD PLANT MATERIAL SHALL BE REPLACED BY THE CONTRACTOR DURING THE TWO YEAR PERIOD AND MAINTAINED FOR AN ADDITIONAL 2 YEAR PERIOD.
13. IMMEDIATELY UPON BID AWARD, CONTRACTOR SHALL SECURE THE PLANT MATERIALS AS SPECIFIED FROM AVAILABLE SOURCES. IN THE EVENT THAT PLANT MATERIALS ARE NOT AVAILABLE, CONTACT LANDSCAPE ARCHITECT FOR APPROVED SUBSTITUTIONS. NO SUBSTITUTION FOR PLANT MATERIAL WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
14. TOP DRESS ALL SHRUB AND GROUND COVER AREAS (NOT LAWN) WITH 3" OF FIR BARK MULCH. SUBMIT SAMPLE TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION.
15. TREE LOCATIONS MAY BE ADJUSTED IN THE FIELD TO SUIT SITE REQUIREMENTS AS DIRECTED BY THE LANDSCAPE ARCHITECT.
16. THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATED PLANTING PITS HAVE POSITIVE DRAINAGE. PLANT PITS FULLY FLOODED WITH WATER SHALL DRAIN WITHIN (12) HOURS OF FILLING.
17. FINISH GRADE SHALL BE SET TO ALLOW POSITIVE DRAINAGE
18. ROTOTILL 2" OF COMPOST INTO ALL PLANTED AREAS.
19. INCORPORATE PEAT INTO THE ROOT ZONE OF RHODODENDRONS, AZALEAS AND OTHER ACID LOVING PLANTS.
20. INCORPORATE 10-20-20 FERTILIZER INTO THE ROOT ZONE OF ALL NEW PLANTINGS.
21. RONSTAR, OR APPROVED EQUAL, PREEMERGENT HERBICIDE TO BE APPLIED TO ALL PLANTED AREAS PER MANUFACTURERS INSTRUCTIONS.
22. EXISTING VEGETATION TO BE SPRAYED WITH ROUNDUP, OR APPROVED EQUAL, PER MANUFACTURERS INSTRUCTIONS. SUFFICIENT TIME SHALL BE GIVEN TO ALLOW EXISTING MATERIAL TO DIE. REMOVE EXISTING 27. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
23. CROWN LAWN AREAS AND GRADE TO PROVIDE POSITIVE DRAINAGE.
24. ROLL LAWN AREA TO INSURE PROPER COMPACTION TO MINIMIZE SETTLING.
25. AMEND SOIL IN LAWN AREAS WITH 80 LBS. OF DOLOMITE LIME AND 40 LBS. OF 10-20-20 SLOW RELEASE FERTILIZER OR EQUIVALENT. PROVIDE A 3" LAYER OF SANDY LOAM TOPSOIL FOR LAWN AND BED AREA.
26. SEED LAWN AREAS WITH GRASS SEED MANUFACTURER'S RECOMMENDATIONS. COVER SEED WITH FINE MULCH APPLIED WITH ROLLER OR HYDROSEED.
27. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
28. PLANT MATERIAL SHALL BE PLANTED W/ ROOT CROWN 1" ABOVE FINISHED GRADE TO ALLOW POSITIVE DRAINAGE AWAY FROM CROWN.
29. STAKE ALL TREES OVER 6 FT. IN HEIGHT PER DETAILS ON THIS SHEET.
30. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
31. ALL PLANTING SHALL BE HAND WATERED OR IRRIGATED BY AN AUTOMATIC UNDERGROUND SPRINKLER SYSTEM.
32. ALL PLANT MATERIALS FURNISHED ARE TO BE HEALTHY, UNIFORMLY BRANCHED AND WITH WELL DEVELOPED FIBROUS ROOT SYSTEMS.
33. ALL PLANT MATERIALS FURNISHED ARE TO BE FREE FROM DEAD OR BROKEN BRANCHES, LICHENS, SCARS, BROKEN BARK OR WOUNDS. ALL PLANT MATERIALS WILL BE INSECT, WEED, AND DISEASE FREE ACCORDING TO THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF AGRICULTURE FOR NURSERY PLANT MATERIALS SOLD FOR WHOLESALE OR RETAIL. ALL PRUNING WOUNDS MUST BE WELL HEALED WITH NO EVIDENCE OF DECAY.
34. FIELD CONFIRM ALL SITE CONDITIONS, AREAS AND SIZES PRIOR TO BIDDING & CONSTRUCTION. DO NOT SCALE FROM PLANS.

Planning Solutions, Inc.
Creating Solutions to Complex Issues
4400 NE 77th Avenue
Suite 275
VANCOUVER, WA 98662
VOICE: 360-750-9000 FAX: 360-713-6102
www.planningsolutionsinc.com

STATE OF WASHINGTON · CHRISTOPHER A. BALMELLI · LICENSED LANDSCAPE ARCHITECT

PRELIMINARY NOT FOR CONSTRUCTION SUBJECT TO APPROVAL

RESERVE AT GREEN MOUNTAIN

2625 NE Goodwin Road
Camas, Washington

DRAWN: BOP	CHECKED: CB
SCALE: NTS	DATE: 05.16.25
JOB #: 25-1967	
ISSUED FOR: PLR	
REVISIONS:	
1	
2	
3	
4	
5	
6	

SHEET NAME:
PLANTING DETAILS

SHEET #:
L2

SHEET 2 OF 2

© COPYRIGHT 2025, PLANNING SOLUTIONS, INC. NO PART OF THIS DRAWING MAY BE COPIED OR REPRODUCED WITHOUT WRITTEN PERMISSION OF PLANNING SOLUTIONS, INC.

DISCLAIMER AND LIMITATIONS: ANY WORK CONTAINED HEREIN INCLUDING BUT NOT LIMITED TO PLANS AND DOCUMENTS ARE INSTRUMENTS OF SERVICE INTENDED FOR USE SOLELY WITH RESPECT TO THIS PROJECT. ALL WORK SHALL BE CONSIDERED CONCEPTUAL AND SUBJECT TO CHANGE. THESE INSTRUMENTS OF SERVICE SHALL BE CONSIDERED A WORK IN PROGRESS WHERE UNKNOWN FACTORS EXIST AND JURISDICTIONAL REQUIREMENTS HAVE NOT BEEN VERIFIED. DUE TO THE HIGH DEGREE OF UNCERTAINTY ASSOCIATED WITH A CONCEPTUAL DESIGN, THESE INSTRUMENTS OF SERVICE SHALL NOT BE USED AS THE BASIS FOR A FINANCIAL EVALUATION OR CONSTRUCTION COST ESTIMATING. NO ASSURANCES ARE OFFERED OR IMPLIED AS TO THE OVERALL FEASIBILITY OF THE PROJECT. ALL WORK SHALL BE SUBJECT TO REVIEW AND FINAL APPROVAL BY ALL APPROPRIATE FEDERAL, STATE AND LOCAL AGENCIES AND SHALL CONTAIN THE PROFESSIONAL SEAL AND SIGNATURE OF ALL REQUIRED DESIGN PROFESSIONALS PRIOR TO ANY USE OF THESE DOCUMENTS. PLANNING SOLUTIONS, INC. AND ITS CONSULTANTS SHALL BE DEEMED THE AUTHORS AND OWNERS OF THEIR RESPECTIVE INSTRUMENTS OF SERVICE AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS.

CLARK COUNTY WASHINGTON
PUBLIC HEALTH
www.clark.wa.gov
1601 E Fourth Plain Blvd, Bldg 17
PO Box 9825
Vancouver, WA 98666-8825
564.397.8000

June 11, 2025

Marwan Bahu
PO Box 744
San Clemente, CA 92672

RE: Conditional Development Review Evaluation for "Reserve at Green Mountain PRD" located at 2625 NE Goodwin Rd, WA 98607 (SR0070402; Tax Parcel 173192000; PA24-1029)

**** Final Health Department approval required****

Clark County Public Health (CCPH) completed the Development Review Evaluation for the site described above. This evaluation is limited to the area of the proposed development.

On-Site Sewage Systems (CCC 24.17, WAC 246-272A, CCC 40.370, RCW 58.17):

An existing individual on-site sewage system (OSS) is listed on the application and there are county records, ON0037607, showing an operational on-site sewage system is at the site, east of the house, with 3 tank riser lids. A site visit on 05/08/25 did find obvious evidence of an on-site sewage system consistent with county records. Any on-site sewage system discovered during development must be properly abandoned with written notice provided to Clark County Public Health and shown on the final plat (Mylar).

Please provide written notification describing the actions taken to legally abandon the system with pumper's receipt attached. Proper system abandonment requires tank pumping by a licensed pumper, removing the tank or breaking in the tank lids, punching a hole in the bottom, and filling the cavities with rock, sand or compacted soil. Cesspools, drywells, or pump chambers discovered during development must also be abandoned in this manner. Below is the link to a free document to document the OSS abandonment.

https://clark.wa.gov/sites/default/files/media/document/2024-01/CCPH%20OSS%20Abandonment%20Notification.pdf

The proposed development must connect to an approved public sewer system. A copy of the final acceptance letter from the sanitary sewer purveyor or the equivalent must be submitted along with the final plat (Mylar).

Water Systems (WAC 173-160, WAC 246-290, CCC 40.370, RCW 58.17):

An existing well is indicated on the application. There are county records indicating a well is at the site. A site visit on 05/08/25 did discover evidence of a well in a concrete well house. WP0014296 was created to track the well status. Any wells identified during development must be properly decommissioned per WAC 173-160-381 by a Washington licensed well driller with written notice provided to Clark County Public Health and the well locations marked on the final plat (Mylar).

The proposed development must connect to an approved public water system. A copy of the final acceptance letter from the purveyor or the equivalent must be submitted along with the final plat (Mylar).

If you have any questions concerning this letter, please contact Clark County Public Health at (564) 397-7244.

Sincerely,

Jason Abraham

Digitally signed by Jason Abraham
Date: 2025.06.11 18:12:39 -07'00'

Environmental Health Specialist

CC: Lisa Harker, PLS Engineering
Madeline Sutherland, City of Camas Planning Division
Anita Ashton, City of Camas Engineering Division

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

June 24, 2025

Lisa Harker, PLS Engineering
pm@plsengineering.com

Nick Edwards
nicke@buildplh.com

Marwan Bahu
PO Box 744, San Clemente, CA

RE: SUB25-1004: Proposed 38-lot subdivision known as "The Reserve at Green Mountain"

Dear Applicant,

Thank you for your submittal for the proposed 38-lot subdivision (The Reserve at Green Mountain). I am the case planner assigned to this project. The purpose of this letter is to inform you that the application submitted on May 28, 2025, has been deemed incomplete and there are items that need to be addressed before we move forward with the review process.

Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete. As a reminder, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite applicable code requirements shall not constitute a waiver by the City of any standard or requirement.

The items necessary for completeness are as follows:

PLANNING

- Please submit photo of Development Sign once installed on project site.

Engineering

CMC 17.11.030.B.5 A survey of existing significant trees:

- The applicant submitted a 'Tree Survey-15-Landscape Plan_v1', however it is a plan sheet with details only.

CMC 17.11.030.B.6.b – Owners of adjacent land and the names of any adjacent subdivisions:

- Only adjacent parcel numbers are noted on the plans. Property owner names are not included.

CMC 17.11.030.B.6.f Location, footprint and setbacks of all existing structures on site:

- The footprint of the existing house to remain are shown, but setbacks for the existing house to remain are not addressed in the Setback table.

CMC 17.11.030.B.8:

- The Preliminary TIR (PTIR) was prepared in accordance with Ecology's 2019 SWMMWW. Stormwater is not vested.
- The PTIR is to be revised and resubmitted in accordance with Ecology's **2024 SWMMWW.**
    - An updated PTIR is to be resubmitted addressing the 2024 SWMMWW requirements as noted in the PA24-1029 pre-app notes.
- The PTIR is to be resubmitted with the applicable Stormwater Operation & Maintenance Manual, which is to be the City of Camas Stormwater Sewer System O&M Manual and not the Clark County Stormwater O&M Manual included in Appendix D of the PTIR.

Non-technically complete comments:

- Additional comments may be provided by Staff, City of Vancouver, and Clark County after review of the Transportation Impact Study.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,



Yvette Sennewald, Senior Planner

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

July 29, 2025

Lisa Harker, PLS Engineering
pm@plsengineering.com

Nick Edwards
nicke@buildplh.com

RE: 2nd Review for SUB25-1004 - Proposed 38-lot subdivision known as "The Reserve at Green Mountain"

Dear Applicant,

Thank you for your recent resubmittal. Upon review of the additional information, there are items that are still needed in order to move forward with the review process. Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete.

The items necessary for completeness are as follows:

Engineering

CMC 17.11.030.B.8:

- Add the revision date to 'Prepared: May 2025' reflecting the date of 2nd submittal (7/3/25).
- Page 2 of 16 references that the Post Office may change the parcel address. This is incorrect as addressing is revised by the Building Official.
- The 2nd submittal (7/3/25) of the Preliminary TIR, Page 8 of 16 references *Clark County's 2021 Stormwater Manual for Minimum Requirements.* Camas has not adopted Clark County's Stormwater Manual.
- Page 9 of 16, Item 2 references 'Maintain the wetland buffer required by county and /or state and federal regulations."
    - The wetland buffers are to meet the City of Camas' buffer requirements.
- Page 11 of 16, references Minimum Requirement #8 Flow Chart of the 2024 Clark County Stormwater Manual. Camas has not adopted the Clark County Stormwater Manual

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,



Yvette Sennewald, Senior Planner

PLS ENGINEERING
ENGINEERING | SURVEYING | PLANNING
604 W EVERGREEN BLVD, VANCOUVER, WA 98660
P 360.944.6519 | F 360.944.6539 | PLSENGINEERING.COM

July 30, 2025

Community Development Department
616 NE 4th Avenue
Camas, WA 98607

RE: The Reserve at Green Mountain Subdivision, SUB25-1004
2nd Review Response Letter

This letter has been written to respond to the specific issues identified by City staff during their review of the application materials for this project. The City staff comments have been included in this document and the responses are included below the issue in bold text.

- Add the revision date to 'Prepared: May 2025' reflecting the date of 2nd submittal (7/3/25)

  'Revised: July 2025' added below 'Prepared: May 2025.'

- Page 2 of 16 references that the Post Office may change the parcel address. This is incorrect as addressing is revised by the Building Official.

  Post Office has been changed to Building Official.

- The 2nd submittal (7/3/25) of the preliminary TIR, Page 8 of 16 references Clark County's 2021 Stormwater Manual for Minimum Requirements. Camas has not adapted Clark County's Stormwater Manual.

  All references of the Clark County Manual have been changed to the Stormwater Management Manual for Western Washington.

PLS ENGINEERING
ENGINEERING | SURVEYING | PLANNING
604 W EVERGREEN BLVD, VANCOUVER, WA 98660
P 360.944.6519 | F 360.944.6539 | PLSENGINEERING.COM

- Page 9 of 16, item 2 reference 'Maintain the wetland buffer required by county and /or state and federal regulations."
    - The wetland buffers are to meet the City of Camas' buffer requirements.

'County' has been changed to 'City of Camas.'

- Page 11 of 16, references Minimum Requirements #8 Flow Chart of the 2024 Clark County Stormwater Manual. Camas has not adopted the Clark County Stormwater Manual.

Page 11 now references the Stormwater Management Manual for Wester Washington, Method 2 flow chart.

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

August 5, 2025

Lisa Harker, PLS Engineering
pm@plsengineering.com

Nick Edwards
nicke@buildplh.com

RE: 3rd Review for SUB25-1004 - Proposed 38-lot subdivision known as "The Reserve at Green Mountain"

Dear Applicant,

Thank you for your recent resubmittal. Upon review of the additional information, there are items that are still needed in order to move forward with the review process. Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete.

The items necessary for completeness are as follows:

Engineering

CMC 17.11.030.B.6.n: Description, location and size of existing and proposed utilities, storm drainage facilities and roads to serve the lots.

- The preliminary utility plans did not include sizes of the existing or proposed utility mains or proposed stormwater system.

CMC 17.11.030.B.8: Preliminary stormwater plan and preliminary stormwater technical information report (TIR). The PTIR is to be prepared in accordance with Ecology's latest edition Stormwater Management Manual for Western Washington (SWMMWW).

- The proposed project is located in the City of Camas and is subject to the city's wetland requirements, not Clark County's wetland requirements, as noted and discussed throughout pages 8 through 16, Section H – Wetland Protection.
- The PTIR is to be revised and resubmitted in accordance with Ecology's 2024 SWMMWW for Wetland Protection and City of Camas Critical Areas Municipal Code.
- Section I – Other Permits references that are not applicable to a Subdivision Land-Use Application, such as preliminary site plan and final site plan approval and building permit approval.
    - Required: Final Decision issued by Hearing Examiner, civil engineering plan approval, and NPDES Permit.

- Section J – Conveyance Systems Analysis and Design states that conveyance design will be provided with the Final TIR.
    - Preliminary stormwater plans are to be submitted with the application.

Non-technically complete comments:

- Additional comments may be provided by Staff, City of Vancouver, and Clark County after review of the Transportation Impact Study.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,



_____

Yvette Sennewald, Senior Planner

PRELIMINARY TECHNICAL INFORMATION REPORT

Reserve at Green Mountain

City of Camas, Washington

Prepared by:
PLS Engineering
Consulting Engineers and Planners
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

Prepared for:
Pacific Lifestyle Homes
11815 NE 99th St Suite 1200
Vancouver, WA 98682

Prepared: May 2025
Revised: August 2025

TABLE OF CONTENTS

CERTIFICATE OF ENGINEER....1

SECTION A – PROJECT OVERVIEW....2

SECTION B – MINIMUM REQUIREMENTS....3

SECTION C – SOILS EVALUATION....4

SECTION D – SOURCE CONTROL....4

SECTION E – ON-SITE STORMWATER MANAGEMENT BMPS....5

SECTION F – RUNOFF TREATMENT ANALYSIS AND DESIGN....6

SECTION G - FLOW CONTROL ANALYSIS AND DESIGN....6

SECTION H – WETLAND PROTECTION....8

SECTION I – OTHER PERMITS....16

SECTION J – CONVEYANCE SYSTEMS ANALYSIS AND DESIGN....16

SECTION K – SPECIAL REPORTS AND STUDIES....16

SECTION L –OPERATIONS AND MAINTENANCE MANUAL....16

Technical Appendices:

Appendix A: Maps

- **Vicinity Map**
- **Soils Map**
- **Critical Areas Map**
- **Basin Maps**

Appendix B: Design Calculations & Modeling

Appendix C: Geotechnical Report

Appendix D: Operations and Maintenance Manual

Appendix E: Construction Stormwater Pollution Prevention Plan (SWPPP)

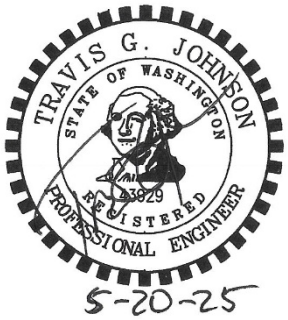
Appendix F: Environmental Documentation

CERTIFICATE OF ENGINEER

Reserve at Green Mountain

Technical Information Report

The technical information and data contained in this report was prepared under the direction and supervision of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.



This document was prepared by:

Calvin Hillman-Johnson

Section A – Project Overview

Section A.1 – Site Information

This project will comply with current City of Camas Standards for Stormwater and Erosion Control per CMC Title 14. The Final Grading / Erosion Control / Drainage Plans have been prepared by the project civil engineer, PLS Engineering, Inc. The site will be served by public sewer and water provided by the City of Camas. This project phase proposes construction of 38 single-family residential lots with associated structures, access, paved storage areas, sewer, water, and storm drain connections. Access to the site is from NE 28th Street.

The physical address of the site is currently 21917 NE Goodwin Rd, but the Building Official may change that prior to the completion of this project. The parcel serial number is 173192000. The property is located in the southeast and southwest quarter of Section 21, T2N, R3E of the Willamette Meridian. The property is bordered by NE 28th Street on the north side, a 1-acre single family lot to the Northwest, a 3-acre residential lot to the West, a 13.39 residential lot to the Southwest, a 6 acre and 2-acre residential lot to the East, and Clark County Parks to the South. The cumulative property area contains a total of 509,117 square feet (11.69 acres), a basin area of 376,257 square feet (8.64 acres) with 83,630.21 square feet (1.19 acres) of right of way dedication, resulting in 292,627 square feet (6.72 acres) of developed area. This technical information report will address the stormwater runoff associated with the construction which will take place.

The topography of the site is moderately sloped from NE to SW, with elevations ranging from 232’ to no greater than 192’. Slopes are generally between 2% and 6%, with some isolated steeper slopes at the South end of the site at around 20%. The site slopes down from relative high point in the NE corner towards the SW property corner. The site contains a 3,016 square foot house, a 1,475 square foot concrete foundation, and a 1,148 square foot garage. The house will remain, and all other structures will be along with existing impervious surfaces on-site are planned to be removed. The remainder of the site is filled with grass, weeds, and a variety of trees. There are wetlands mapped on Clark County Maps at the SW corner of the site. There is a stream marked in the Southeast corner of the site. Otherwise, there are no known water courses, areas prone to flooding, floodplains, shoreline areas, water bodies, unstable slopes, landslide hazard areas, habitat, critical areas, or historic sites located on the site. Site drainage follows the slope of the land going from the NE corner to the SE corner. Site discharge will not exceed historic rates.

After construction, the site will contain approximately 109,745 square feet of landscaped area. The remainder of the site is anticipated to be covered with impervious surfaces. This will include 177,048 square feet of roof area, 14,415 square feet of sidewalk, and 41,865 square feet of concrete and asphalt for driveways and drive aisles. Site stormwater will be routed to a detention pond that will release the runoff at rates less than existing in accordance with the SWMMWW. Frontage stormwater will be routed to a bioretention facility for treatment and infiltration. Site stormwater runoff treatment for the site’s pollution generating impervious surfaces will be accomplished with media filter treatment cartridges located in stormwater structures throughout the site.

Section B – Minimum Requirements

Section B.2 – Determination of Applicable Minimum Requirements

After site development, disturbed impervious surfaces will cover approximately 266,512 square feet, or 53% of the disturbed project area; projects resulting in more than 5,000 square foot of hard surface area must meet all nine Minimum Requirements of the stormwater manual. The entirety of the developed site will all discharge to the detention pond, acting as one TDA, and will all be required to meet Minimum Requirements #6 and #7. The stormwater system is designed to comply with all City requirements for stormwater treatment and quantity control. The treatment regulations require treatment of 91% of the total runoff volume from pollution generating impervious surfaces while the quantity control regulations require that post-development discharges shall match pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

Existing hard surface	36,780 ft^2
New hard surface	266,512 ft^2
Replaced hard	33,764 ft^2
Native vegetation converted to lawn or landscaping	109,745 ft^2
Native vegetation converted to pasture	0 ft^2
Total land-disturbing activity	8.64 acre
Pollution-generating hard surface	89,464 ft^2
Pollution-generating pervious surface	0 ft^2
Total pollution-generating surfaces	89,464 ft^2
Total non-pollution-generating surfaces	286,793 ft^2

MR #1) Preparation of Stormwater Site Plans

All Stormwater System designs meet City of Camas Requirements for conveyance, quality control and quantity. See final construction documents for more details.

MR #2) Construction Stormwater Pollution Prevention

A Stormwater Pollution Prevention Plan is being included with this report and will be onsite for the duration of the project's construction.

MR #3) Source Control of Pollution

See Section D

MR #4) Preservation of Natural Drainage Systems and Outfalls

Site runoff flows to the SE corner of the site. The proposed development will capture the existing runoff and infiltrate some and releasing the rest at rates that are incompliance with the SWMMWW. This will maintain and preserve the natural drainage systems.

MR #5) Onsite Stormwater Management

See Section E

MR #6) Runoff Treatment
See Section F

MR #7) Flow Control
See Section G

MR #8) Wetland Protection
Clark County maps show a category II NWI wetland located in the SW corner of the site. See Appendix F for documentation discussing impact on the wetland and Sections H.

MR #9) Operations and Maintenance
See Appendix D

Section C – Soils Evaluation

The soils are mapped by the NRCS as McBee silt loam (MlA) in the Northeast corner of the site, Dollar loam (DoB), in the north, Cove silty clay (CvA) on the West edge and Southwest section, and Lauren gravelly loam (LrC) in under the existing house and Southwest corner. The geotechnical soil investigation found surface soils generally consistent with that soil mapping. The geotechnical report has been included in Appendix C and a soil map is included in Appendix A.

True North Geotechnical, Inc. completed a geotechnical review of the site, dated April 2025. Infiltration testing was performed on site and was deemed insignificant. Groundwater was encountered in test pits 1, 2, 3, 6, 8 and 9. The location of the detention pond has groundwater located 3.5 ft below ground surface. Based on the observed groundwater elevations, infiltration is not feasible on the South end of the site.

Section D – Source Control MR #3

The pollution risks involved with this project mainly include the sediment accumulation involved with construction. The Stormwater Pollution Prevention Plan is a document that notes our certain Best Management Practice's (BMP's) that will help prevent sediment laden water from leaving the site during construction. The Erosion Control Plan located in the final construction drawings will provide protection measures involved with minimizing the chance that sediment from the site could enter downstream waterways. After construction is complete, this project does not necessitate any special source control measures due to abnormal risks associated with the project. As this is a single-family home development, appropriate source control responsibilities will fall primarily on property owner(s). The SWPPP is provided in Appendix E.

Section E – On-site Stormwater Management BMPs MR #5

Minimum Requirement 5 requires the applicant to employ On-site Stormwater Management BMPs in accordance with the following project thresholds, standards, and lists to infiltrate, disperse, and retain stormwater runoff on-site to the maximum extent feasible without causing flooding or erosion impacts. Based on section I-2.5.1 of the Western Washington Stormwater Manual the development is within the UGA on a parcel that is less than 5 acres therefore Low Impact Development Performance Standards and BMP T5.13; or List #2 will apply (applicant option).

To meet Minimum Requirement 5 the applicant proposes a single solution**.** The entire site will comply with LID performance standards and BMP T5.13. The site will meet List #2 as outlined below. All requirements that will be applied to this project are noted below and shown in the final construction drawings. If certain BMP's are infeasible; infeasibility criteria per the 2024 Stormwater Management Manuel for Western Washington are also noted.

List #2 (for the south end of the site only):
Lawn and Landscape areas:
BMP T5.13 Post-Construction Soil Quality and Depth:
This requirement will be met during final design and shown on final construction drawings.

Roofs:
BMP T5.30 or BMPT5.10 Full Dispersion or Downspout Full Infiltration:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMPT7.30: Bioretention:
The soil permeability factor above groundwater is less than 0.3 inches per hour. Because the site soils don't accommodate infiltration, this is not a feasible BMP as part of Minimum requirement #5.

BMPT5.10B Downspout Dispersion Systems:
There is insufficient space to meet the required dispersion lengths and setbacks from the structures and the property lines.

BMP T5.10C Perforated Stub-out Connections
There is insufficient space to meet the required setback of 10' away from the structures and property lines, and infiltration rates are less than 0.3 inches per hour.

Other Hard Surfaces:
BMP T5.30 Full Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMP T5.15 Permeable Pavement:
Permeable pavement is insufficient due to soil infiltration above the groundwater table being less than 0.3 in/hr.

BMP T7.30: Bioretention:
The soil permeability above the groundwater table is less than 0.3 inches per hour. This is not a feasible solution.

BMP T5.12 Sheet Flow Dispersion or BMP T5.11: Concentrated Flow Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

None of the List 2 requirements can be met by this project. Consequently, stormwater on the South end of the project will be treated and detained prior to discharge as described in Sections F and G of this report.

The following BMPs will be implemented to meet the minimum 5 requirements:

- **BMP T5.13: Post-Construction Soil Quality and Depth** for lawn and landscaped areas.
- **BMP D.1: Detention Ponds** for runoff from the site.

Section F – Runoff Treatment Analysis and Design MR#6

Treatment for the site will be accomplished via media filter cartridges that will be placed in a vault at the south end of the site. The filter system will treat the pollution generating surface runoff that is conveyed to it. Runoff from the building roofs and other non-pollution generating areas will be piped to bypass the filter cartridges when possible. The cartridge units will be sized to treat all the runoff that is routed to them.

For this preliminary phase it is assumed that the entire site will be treated. The Treatment Analysis WWHM model contained in Appendix B identifies an off-line WQ flow of 0.3651 CFS. Per Table 1 below, LowDrop PhosphoSorb cartridges are designed to treat 0.019 CFS each. So, the most LowDrop PhosphoSorb cartridges that would be used for this project will be 20 cartridges contained within a vault before the detention pond at the south end of the site. The final design will evaluate the vault and its sizing.

Table 1-Contech Sizing Chart

	Perlite 2 GPM/ft²			ZPG 1 GPM/ft²			PhosphoSorb 1.67 GPM/ft²		
StormFilter	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color
LowDrop	10	0.022	Gray (GRY)	5.00	0.011	Blue (BLU)	8.35	0.019	Yellow (YLW)
18"	15	0.033	Black (BLK)	7.50	0.017	Blue (BLU)	12.53	0.028	Red (RED)
27"	22.5	0.05	Gold (GLD)	11.50	0.025	Pink (PNK)	18.79	0.042	White (WHT)

Section G - Flow Control Analysis and Design

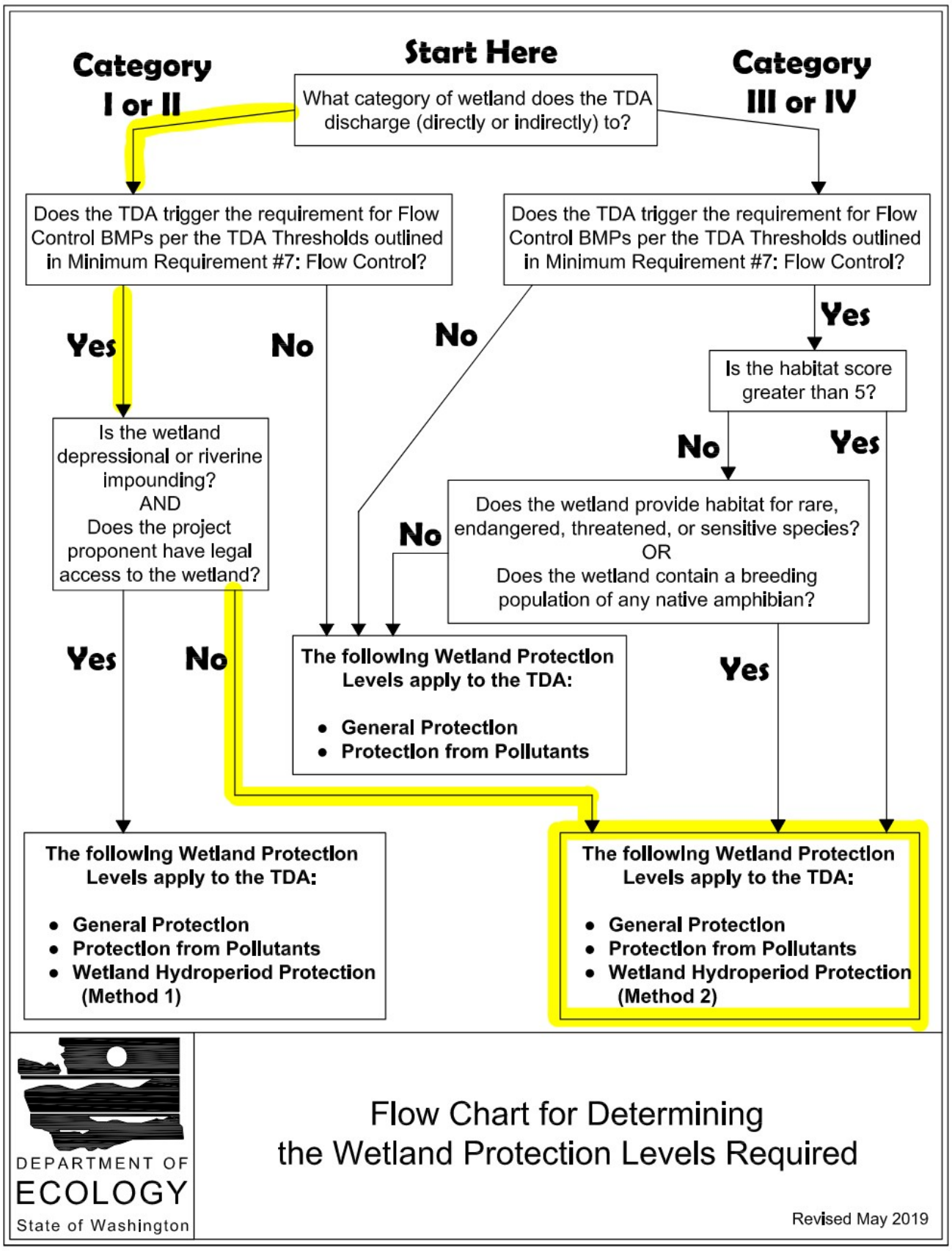
The stormwater quantity control system for this site has been designed based on the current stormwater quantity control requirements per Ecology's 2024 SWMMWW, MR#7. The quantity control standards require that stormwater discharges shall match developed discharge durations to pre-developed

durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

The detention pond mentioned in Section F were modelled in WWHM and successfully stores and releases all of the stormwater runoff from the site without using infiltration. Modeling basins were calculated as a developed site using Soil Group 3 as the underlying soils per the geotechnical recommendation contained in Appendix C. Calculations and values can be seen in Appendix B.

The detention pond design for Basin one has a square footage of 3,030', an equivalent square footage was used for WWHM calculations. The basin has an effective depth of 5', with 3:1 sloped on all sides. It has a riser height of 4', diameter of 18", notch height of 1.25', width of 1', and an orifice diameter of 4.5". The WWHM design model in Appendix B shows that this detention pond exceeds the requirements and can be reduced in size. This preliminary TIR is showing that stormwater for the site can meet the requirements of SWMMWW. The sizes of this facility will be fine-tuned in the final design.

Infiltration does not work if the groundwater is too shallow. Consequently, groundwater depth is a significant issue for this project. The geotechnical investigation discovered ground water in 6 of the test pits. The only test pits to not encounter groundwater are 4, 5 and 7. Because of this infiltration is not used on the site.


Start Here
What category of wetland does the TDA discharge (directly or indirectly) to?
Category I or II
Category III or IV
Does the TDA trigger the requirement for Flow Control BMPs per the TDA Thresholds outlined in Minimum Requirement #7: Flow Control?
Does the TDA trigger the requirement for Flow Control BMPs per the TDA Thresholds outlined in Minimum Requirement #7: Flow Control?
Yes
No
No
Yes
Is the habitat score greater than 5?
No
Yes
Is the wetland depressional or riverine impounding? AND Does the project proponent have legal access to the wetland?
Does the wetland provide habitat for rare, endangered, threatened, or sensitive species? OR Does the wetland contain a breeding population of any native amphibian?
No
Yes
No
Yes
Yes
The following Wetland Protection Levels apply to the TDA:
• General Protection
• Protection from Pollutants
The following Wetland Protection Levels apply to the TDA:
• General Protection
• Protection from Pollutants
• Wetland Hydroperiod Protection (Method 1)
The following Wetland Protection Levels apply to the TDA:
• General Protection
• Protection from Pollutants
• Wetland Hydroperiod Protection (Method 2)
DEPARTMENT OF ECOLOGY
State of Washington
Flow Chart for Determining the Wetland Protection Levels Required
Revised May 2019

Section H – Wetland Protection

2024 SWMMWW I-C.2 General Wetland Protection

All wetlands (Categories I, II, III, and IV) must receive the following general protection:

1. Consult regulations issued under federal and state laws that regulate the discharge of pollutants to surface waters, including the Construction Stormwater General NPDES Permit.

   The site stormwater system has been appropriately designed and complies with federal and state laws and discharging to the wetland in the proposed manner is allowed. Refer to section B of this report for compliance with Minimum Requirements 1-9. An NPDES permit will be applied for and obtained during final engineering design.

2. Maintain the wetland buffer required by City of Camas and federal regulations

   The critical Areas Report produced by Ash Eco Solutions identified a standard buffer of 260'. The wetland is located on the very edge of the southwest border of the sight continuing past the site. Due to site limitations, the project cannot avoid impacting the wetland buffer. The Critical Areas Report discusses a reduction to 195' buffer for the wetland and using buffer averaging.

3. Retain areas of native vegetation connecting the wetland and its buffer with nearby wetlands and other contiguous areas of native vegetation.

   The Critical Areas Report shows a stream connecting to a wetland in the southeast of the project sight. This wetland is upstream and flows down across the sight. Vegetation surrounding the stream, and its buffer, will be avoided to the maximum extent possible.

4. Avoid compaction of soil and introduction of invasive plant or animal species in the wetland and its buffer.

   Most of the wetland exists off site and will not be constructed on, and any onsite wetlands will not be constructed on either. compaction and introduction of invasive species within the buffer will be avoided to the maximum extent feasible.

5. Take measures to avoid general physical impacts (e.g., littering and vegetation destruction). Examples are protecting existing buffer zones; discouraging access, especially by vehicles, by planting outside the wetland, and encouragement of stewardship and signage by landowners.

   The majority of the wetland is located offsite, however physical impacts to the buffer will be avoided to the maximum extent feasible. Silt fencing will be installed along the project grading limits to discourage access to the wetland. Disturbances to the buffer have been accounted for in the critical areas report.

6. Any stormwater management practices, such as Runoff Treatment or Flow Control BMP implementation, must be done outside of the wetland buffer boundary, except limited circumstances where the wetland and/or buffer any be used for additional Runoff Treatment and/or Flow Control of stormwater (See 1-C.6 Compensatory Mitigation of Wetlands)

   No stormwater management or flow control BMPs are implemented inside of a wetland buffer.

7. Discharge from a BMP or project site should be dispersed using a method to diffuse the flow before entering the wetland buffer.

   Upon exiting the detention pond, a riprap pad is used at the outflow point to partially diffuse the flow. Due to elevation constraints and site limitation, it is not possible to diffuse runoff prior to entering the wetland buffer.

8. Consider fences to restrict human access, but make sure it doesn't interfere with wildlife movement. They should be used when wildlife passage is not a major issue and the potential for intrusive impacts is high. When wildlife movement and intrusion are both issues, circumstance will have to weighed to make a decision about fencing. Check with the local and/or state agencies to determine if fencing would be allowed.

   The majority of the wetland is located offsite. Fencing is not being proposed around the wetland or buffer. Intrusive impacts to the wetland are not expected.

2024 SWMMWW I-C.3 Wetland Protection from Pollutants

All wetlands (Categories, I, II, III and IV) must receive the following protection from pollutants:

1. Provide Construction Stormwater BMPs as directed in I-3.4.2 MR2: Construction Stormwater Pollution Prevention Plan (SWPPP) to prevent sediment and other pollutants from entering the wetland.

   A Construction Stormwater BMPs as directed in Book 1, Section 1.5.2 MR #2 Construction Stormwater Pollution Prevention Plan (SWPPP) to prevent sediment and other pollutants from entering the wetland.

2. Provide Source Control BMPs as directed in I-3.4.3 MR3: Source Control of Pollution. Refer to Volume IV and local jurisdiction requirements.

   Refer to Minimum Requirement #3 in Section B of this report for the proposed Source Control BMPs.

3. Provide On-Site Stormwater Management and use LID principles as much as practicable for the site, as directed in I-3.5.4 MR5: On-Site Stormwater Management. LID principles and practices will help meet other wetland hydroperiod protection criteria and provide additional habitat.

Refer to Minimum Requirement #5 and Section E of this report for the proposed stormwater management BMPs. LID principles were incorporated into the design to the extent feasible.

4. Provide Runoff Treatment for I-3.4.6 MR6: Runoff Treatment to treat runoff prior to entering the wetland and its buffer.

   The storm water will be treated in a vault prior to entering any wetland or its buffer.

2024 SWMMWW I-C.4 Wetland Hydroperiod Protection

The intent of the Wetland Hydroperiod Protection is to maintain the wetland's annual fluctuations in water depth and it's timing as closely as possible (Methods 1 and 2) that are dependent on the wetland category and whether the project has legal access to the wetland.

According to Figure 1.4 (Minimum Requirement #8 Flow Chart) of the 2024 Stormwater Management Manual for Western Washington, Method 2 shall be used for this project.

Criteria for Method 2:

The project proponent must ensure both of the following criteria are met to comply with method 2 of the Wetland Hydroperiod Protection.

> Criteria 1: Mean Daily Total Discharge Volumes from the Site. The total volume of water into the wetland on a daily basis should not be more than 20% higher or lower than the pre-project volumes.
>
> Criteria 2: Mean Monthly Total Discharge Volumes from the Site. The total volume flow of water into the wetland on a monthly basis should not be more than 15% higher or lower than the pro-project volumes.

The Western Washing hydrology model (WWHM) was used to complete the Method 2 modeling.

There are two wetlands associated with this site. One is an offsite Category II wetland located southeast of the site. The area associated with the natural discharge to this wetland is contained and will not be impacted due to the development of the site. There is one on site Category II wetland that is receiving runoff from the site predeveloped conditions. Development will impact the discharge area and discharge volumes to the existing wetland. Wetland hydroperiod protection method 2 will be applied as it is a category 2 slope wetland.

Off-site Wetland A Category II Method 2 Hydroperiod Protection Analysis:

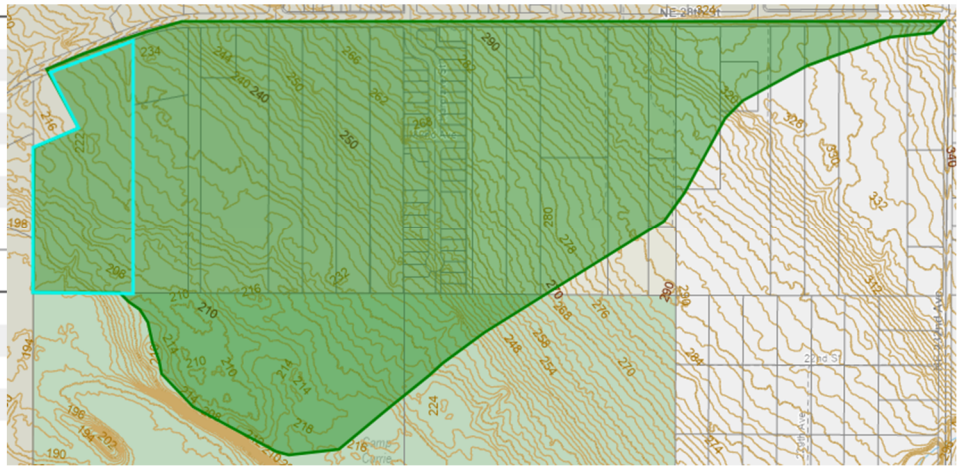
Per I-C.5 Wetland Hydroperiod Protection; Method 2

Pre-Project Scenario:

Step 1: Identify existing impervious and pervious surfaces that discharge to the wetland and use the model elements to represent these land areas.

Due to the large contributing basin of the on-site Category II wetland the Clark County GIS software was used to evaluate the existing contours and existing drainage infrastructure to assess the contributing discharge basin that provides hydrology to the wetland both on and off-site. The approximate total area that contributed to the wetland was determined to be 5,115,562.38 square feet (117.44 acres). The contributing area is shown below.

Area Information	
Sq. Feet:	5,115,562.38
Sq. Yards:	568,395.82
Sq. Miles:	0.18
Acres:	117.44
Sq. Meters:	475,251.30
Sq. Kilometers:	0.48
Hectares:	47.53
Perimeter Information	
Feet:	11,160.84
Yards:	3,720.28
Miles:	2.11
Meters:	3,401.82
Kilometers:	3.40



After the basin boundary was determined the existing pervious and impervious areas offsite were determined with the use off google arial images, Clarg County GIS, and scaled maps with Bluebeam software. The on and off-site pervious and impervious areas are detailed below.

Onsite Pre-Project Areas

Basin	Surface Cover	Area (AC)
1	Forest	8.6377

Off-site Pre-Project Area

Surface Cover	Area (AC)
Roof	2.3306
Road	1.1934
Gravel	3.2286
Forest	56.7077
Fields	53.9768
Total	117.4372

To represent the pervious and impervious land area in WWHM, lateral flow basin elements were used. For all lawn, field and forested land areas pervious later basins were utilized. For all grave roads and roof areas and impervious later basin elements were used.

Step 2: Identify the wetland buffer area and use the lateral flow soil basin to represent the wetland buffer.

To determine the area of the wetland buffer, a 190' moderate LUI buffer was measured using Bluebeam, the area was modeled in WWHM with the later flow soil basin.

The Wetland Buffer area was determined to be **81.0229 acres.**

The determined 260' moderate LUI buffer expands onto the project site. Of the 8.6377 acres of onsite area, only 5.1363 acres were determined as part of the wetland buffer.

Step 3: Connect the model elements to the wetland buffer ensuring that impervious land areas are connected to surface flows and that for any other model elements all flows are connected.

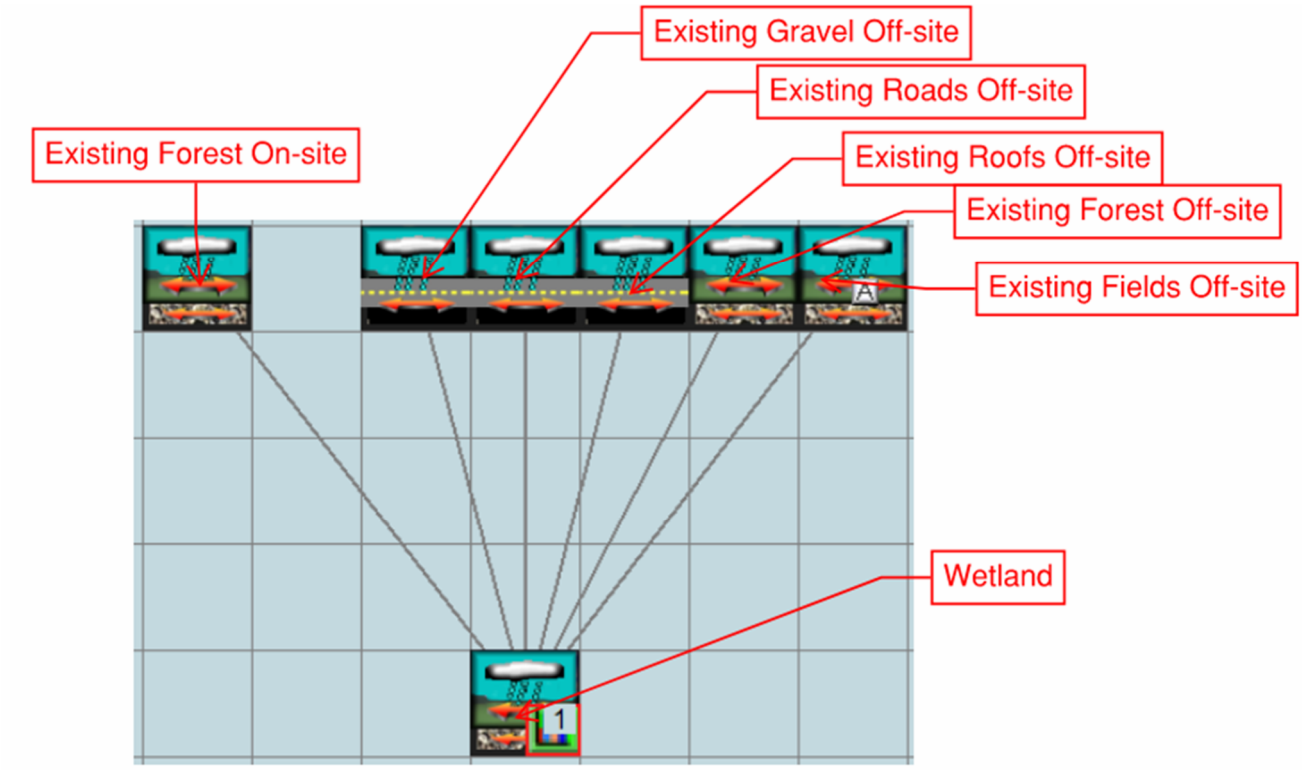
The land use areas determined in steps one and two were associated to the proper lateral basins. The onsite lateral basin and all off-site lateral basins elements were individually connected to the lateral basin representing the wetland buffer.

Step 4: Set the wetland buffer element as the most downstream element:

The later basin representing the wetland buffer is set as the downstream basin, where all other basins are connected to discharge to the wetland basin.

Step 5: Set the POC at the outflow of the wetland buffer element including surface runoff, interflow and groundwater.

Ex Wetland lateral basin element attached to POC 1 including surface runoff, interflow and groundwater.



Post-project Simulation:

Step 1: Identify anticipated post-project impervious and pervious surfaces that discharge to the wetland and use the model elements to represent these land areas.

Of the 8.6377 acres of on site, predeveloped land cover, both in and outside of the buffer range, all 8.6377 will be routed through the wetland. All off-site areas will remain the same post-Project.

Onsite Post-Project Area

Basin	Surface Cover	Area (AC)
1	Lawn	2.5194
1	Roof	6.1183

Off-Site Post-Project Area

Surface Cover	Area (AC)
Roof	2.3306
Road	1.1934
Gravel	3.2286
Forest	59.7077
Fields	53.9798
Total	117.4372

Step 2: Identify any Flow Control BMPs and use the appropriate model elements to represent these facilities

All flow discharging from the developed site to the studied wetland are discharging via detention pond.

Step 3: Identify the wetland buffer area and use the lateral flow soil basin to represent the wetland buffer.

The wetland buffer area will decrease to the 195' moderate LUI buffer and will further decrease by 26,271 square feet for the buffer reduction area mentioned on page 30 of the critical areas report in appendix F.

Step 4: Connect the model elements to the wetland buffer ensuring that impervious land areas are connected to surface flows and that for any other model elements all flows are connected.

Post-project lateral basins are connected to the wetland elements. All basins used are pervious lateral flow basins connected via surface flow, interflow and groundwater.

Step 5: Connect any flow control BMPS elements to the wetland buffer ensuring that surface flows are connected to surface water and any infiltration is connected to ground water.

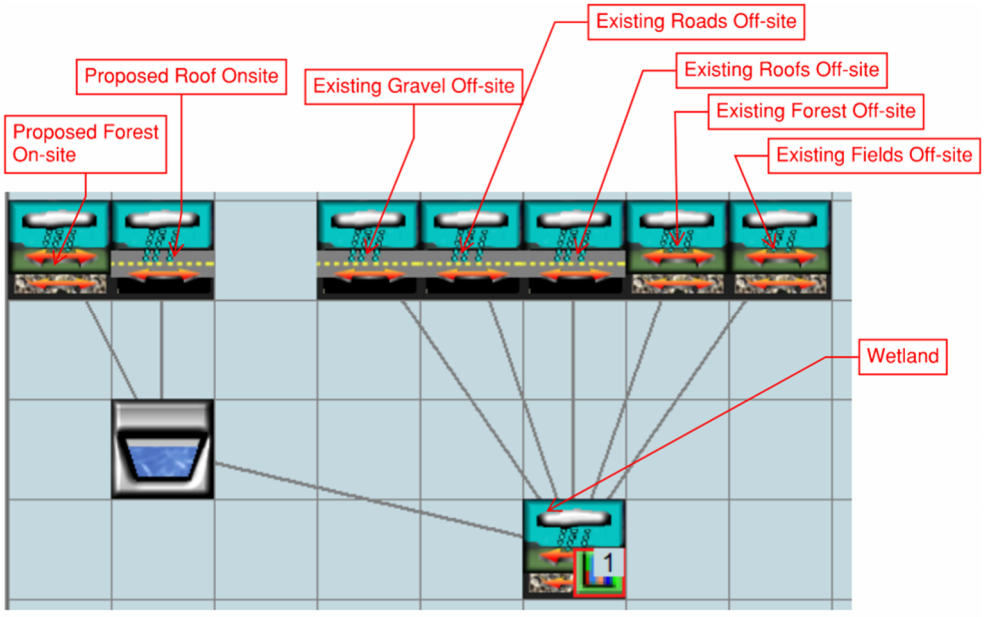
The detention pond is connected to the onsite lateral basins and connected to the wetland out of outlet one and into surface flow.

Step 6: Set the wetland buffer element to the most downstream element.

All lateral basins are set to connect to the wetland element.

Step 7: Set the POC at the outflow of the wetland buffer element including surface runoff, interflow and groundwater.

POC 1 is connected to the wetland element set to be the outflow including surface runoff, interflow, and groundwater.



Both scenarios were run, and then POC 1 was analyzed via the Wetland Input Volumes analysis. The model passed all 365 days of criteria 1 and passed all 12 months of criteria 2.

WWHM Reports can be found in Appendix B.

The model as ran and the results were analyzed. The system passed all 365 days of Criterion 1 and passed all 12 months of Criterion 2. The full WWHM report is attached.

Section I – Other Permits

The project will be required to obtain Final Decision issued by Hearing Examiner, civil engineering plan approval, and NPDES construction stormwater permit.

Section J – Conveyance Systems Analysis and Design

Preliminary calculations were done in HydroCAD and a 15" storm pipe will be able to convey all water through the site. Conveyance will be provided with the Final TIR.

Section K – Special Reports and Studies

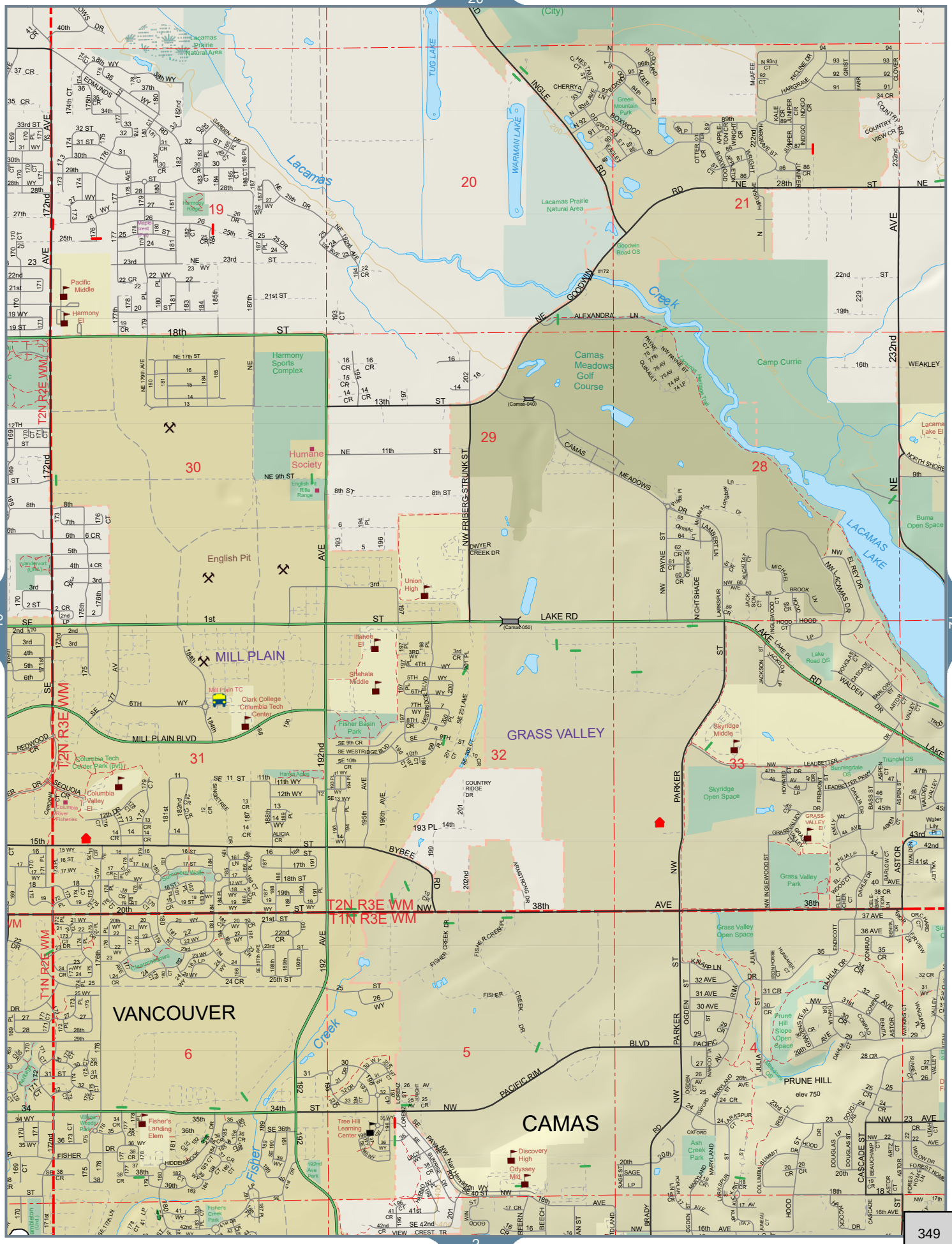
A Geotechnical Report for the site was prepared by True North, Inc. and is included in Appendix C. A Critical Areas report is included in Appendix F. No other special studies are anticipated to be needed.

Section L –Operations and Maintenance Manual

The stormwater facility located on-site will be maintained by the site owner. An Operations and Maintenance Manual is included as Appendix D of this report.

APPENDIX A

Maps


20
10
12
2
VANCOUVER
CAMAS
GRASS VALLEY
MILL PLAIN
T2N R2E WM
T2N R3E WM
T1N R3E WM
T1N R2E WM
Lacamas Creek
Fisher Creek
Lacamas Lake
Camp Currie
Camas Meadows Golf Course
Harmony Sports Complex
Humane Society
English Pit
Lacamas Prairie Natural Area
Goodwin Road OS
Green Mountain Park
Skyridge Open Space
Grass Valley Park
Grass Valley Open Space
Prune Hill Slope Open Space
Ash Creek Park
Fisher Basin Park
Lake Road OS
Buma Open Space
Sunningdale OS
Triangle OS
Waterlily Pl
PRUNE HILL
elev 750
Pacific Middle
Harmony El
Union High
Illahee El
Shahala Middle
Skyridge Middle
Discovery High
Odyssey Mid
Fisher's Landing Elem
Tree Hill Learning Center
Columbia Valley El
Clark College Columbia Tech Center
Mill Plain TC
Columbia Tech Center Park (PV)
Fisher's Creek Park
192nd Ave Park
Lacamas Lake El
Lacamas
TUG LAKE
WARMAN LAKE
LACAMAS LAKE
INGLE RD
LAKE RD
GOODWIN RD
NW FRIBERG-STRUNK ST
PARKER AVE
BYBEE RD
PACIFIC RIM BLVD
MILL PLAIN BLVD
CAMAS MEADOWS DR
NW LACAMAS DR
NW EL REY DR
ALEXANDRA LN
NW PAYNE ST
NIGHTSHADE
SEQUOIA
REDWOOD
WESTRIDGE BLVD
COUNTRY RIDGE DR
FISHER CREEK DR
ARMSTRONG DR
PACIFIC
OGDEN
JULIA
DAHLIA DR
CASCADE ST
ASTOR
WALDEN
LEADBETTER
WEAKLEY
NORTH SHORE
Camas-040
Camas-050
Lacamas Heritage Trail
Lacamas Prairie Natural Area
Creek
20
21
19
29
28
30
31
32
33
6
5
4
34
1st ST
2nd ST
3rd ST
4th ST
5th ST
6th ST
7th ST
8th ST
9th ST
10th ST
11th ST
12th ST
13th ST
14th ST
15th ST
16th ST
17th ST
18th ST
19th ST
20th ST
21st ST
22nd ST
23rd ST
24th ST
25th ST
26th ST
27th ST
28th ST
29th ST
30th ST
31st ST
32nd ST
33rd ST
34th ST
35th ST
36th ST
37th ST
38th ST
39th ST
40th ST
41st ST
42nd ST
43rd ST
45th ST
47th ST
SE 42nd CR
SE 40 ST
SE 38th ST
SE 36th ST
SE 34th ST
SE 32nd ST
SE 30th ST
SE 29th ST
SE 28th ST
SE 27th ST
SE 26th ST
SE 25th ST
SE 24th ST
SE 23rd ST
SE 22nd ST
SE 21st ST
SE 20th ST
SE 19th ST
SE 18th ST
SE 17th ST
SE 16th ST
SE 15th ST
SE 14th ST
SE 13th ST
SE 11th ST
SE 10th CR
SE 9th CR
NE 9th ST
NE 11th ST
NE 13th ST
NE 16th ST
NE 17th ST
NE 18th ST
NE 19th ST
NE 20th ST
NE 21st ST
NE 22nd ST
NE 23rd ST
NE 25th ST
NE 26th ST
NE 27th ST
NE 28th ST
NE 29th ST
NE 30th ST
NE 32nd ST
NE 34th ST
NE 36th ST
NE 38th ST
NE 40 ST
NE 42nd CR
NW 9th ST
NW 11th ST
NW 13th ST
NW 14th ST
NW 16th ST
NW 17th ST
NW 18th ST
NW 19th ST
NW 20th ST
NW 21st ST
NW 22nd ST
NW 23rd ST
NW 25th ST
NW 26th ST
NW 27th ST
NW 28th ST
NW 29th ST
NW 30th ST
NW 32nd ST
NW 34th ST
NW 36th ST
NW 38th ST
NW 40 ST
NW 42nd CR
NW 43rd ST
NW 45th ST
NW 47th ST
172nd AVE
173rd AVE
175th AVE
176th AVE
177th AVE
178th AVE
179th AVE
180th AVE
181st AVE
182nd AVE
183rd AVE
184th AVE
185th AVE
186th AVE
187th AVE
188th AVE
189th AVE
190th AVE
191st AVE
192nd AVE
193rd AVE
194th AVE
195th AVE
196th AVE
197th AVE
198th AVE
199th AVE
200th AVE
201st AVE
202nd AVE
232nd AVE
NW 23 AVE
NW 30 AVE
NW 31 AVE
NW 32 AVE
NW 36 AVE
NW 37 AVE
NW 38th AVE
NW 39th AVE
NW 41st AVE
NW 42nd AVE
NW 43rd AVE
NW 45th AVE
NW 47th AVE
SE 192nd AVE
SE 193rd AVE
SE 195th AVE
SE 196th AVE
SE 200th AVE
SE 201st AVE
SE 202nd AVE
SE 207th CT
SE 208th CT
SE 209th CT
SE 210th CT
SE 211th CT
SE 212th CT
SE 213th CT
SE 214th CT
SE 215th CT
SE 216th CT
SE 217th CT
SE 218th CT
SE 219th CT
SE 220th CT
SE 221st CT
SE 222nd CT
SE 223rd CT
SE 224th CT
SE 225th CT
SE 226th CT
SE 227th CT
SE 228th CT
SE 229th CT
SE 230th CT
SE 231st CT
SE 232nd CT
SE 233rd CT
SE 234th CT
SE 235th CT
SE 236th CT
SE 237th CT
SE 238th CT
SE 239th CT
SE 240th CT
SE 241st CT
SE 242nd CT
SE 243rd CT
SE 244th CT
SE 245th CT
SE 246th CT
SE 247th CT
SE 248th CT
SE 249th CT
SE 250th CT
SE 251st CT
SE 252nd CT
SE 253rd CT
SE 254th CT
SE 255th CT
SE 256th CT
SE 257th CT
SE 258th CT
SE 259th CT
SE 260th CT
SE 261st CT
SE 262nd CT
SE 263rd CT
SE 264th CT
SE 265th CT
SE 266th CT
SE 267th CT
SE 268th CT
SE 269th CT
SE 270th CT
SE 271st CT
SE 272nd CT
SE 273rd CT
SE 274th CT
SE 275th CT
SE 276th CT
SE 277th CT
SE 278th CT
SE 279th CT
SE 280th CT
SE 281st CT
SE 282nd CT
SE 283rd CT
SE 284th CT
SE 285th CT
SE 286th CT
SE 287th CT
SE 288th CT
SE 289th CT
SE 290th CT
SE 291st CT
SE 292nd CT
SE 293rd CT
SE 294th CT
SE 295th CT
SE 296th CT
SE 297th CT
SE 298th CT
SE 299th CT
SE 300th CT





Legend

- Taxlots
- Severe Erosion Hazard Areas
- Steep Slopes and Landslide H
  - Areas of Historic or Active Landslid
  - Areas of Potential Instability
  - Areas of Older Landslide Debris
  - Slopes > 15%
  - Slopes > 25%
- Permitted Wetland
- NWI Wetland
- Stream
- Lake
- Shoreline Designations
  - Aquatic
  - Natural
  - Urban Conservancy
  - Medium Intensity
  - High Intensity
  - Rural Conservancy Residential
  - Rural Conservancy Resource Land

Notes:

752.3 0 376.17 752.3 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. T (i.e., parcel) boundaries cannot be used to determine th location of property lines on the ground.

Reserve at Green Mountain

Located in the SE ¼ of Section 21, T2N, R3E and in
the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

Sheet Index

1. Predevelopment Basin Map
2. Postdevelopment Basin Map

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Marwan Bahu
PO Box 744
San Clemente, CA 92672

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173192-000
2625 NE GOODWIN RD
Camas, WA 98607



VICINITY MAP
NOT TO SCALE

1 Point of Compliance 1: Post-Development Basin Area

Basin 1 Areas:

Road:	1.34 ac
Sidewalk:	0.33 ac
Roof:	4.06 ac
Driveway:	0.38 ac
Landscape:	2.52 ac
Total:	8.64 ac
Total POC 1 Area:	8.64 ac

Drainage Basin Legend

POC Line
Basin Line
Subcatchment Area ID (#)

Scale 1" = 50'
50 25 0 50



Post-Development Basin Map For:

Reserve at Green Mountain

A Subdivion Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

ENGINEERING
PLS

Revisions

1	2	3	4	5	6

Project No. 3927

SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	###
DRAFTED BY:	###
REVIEWED BY:	###

2
2

Reserve at Green Mountain

Located in the SE ¼ of Section 21, T2N, R3E and in
the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

Sheet Index

1. Predevelopment Basin Map
2. Postdevelopment Basin Map

GENERAL NOTES

Applicant:
Pacific Lifestyle Homes
11815 NE 99th Street
Vancouver, WA 98682
Office (360) 304-9901

OWNER:
Marwan Bahu
PO Box 744
San Clemente, CA 92672

CIVIL ENGINEER:
PLS Engineering
Contact: Travis Johnson, PE
604 W Evergreen Blvd
Vancouver, WA 98660
PH: (360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173192-000
2625 NE GOODWIN RD
Camas, WA 98607



VICINITY MAP
NOT TO SCALE

1 Point of Compliance 1: Pre-Development Basin Area

Basin 1 Areas:

Landscape:	8.64 ac
Total:	8.64 ac
Total POC 1 Area:	8.64 ac

Drainage Basin Legend

POC Line
Basin Line
Subcatchment Area ID (#)

Scale 1" = 50'
50 25 0 50



Pre-Development Basin Map For:

Reserve at Green Mountain

A Subdivion Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

ENGINEERING
PLS

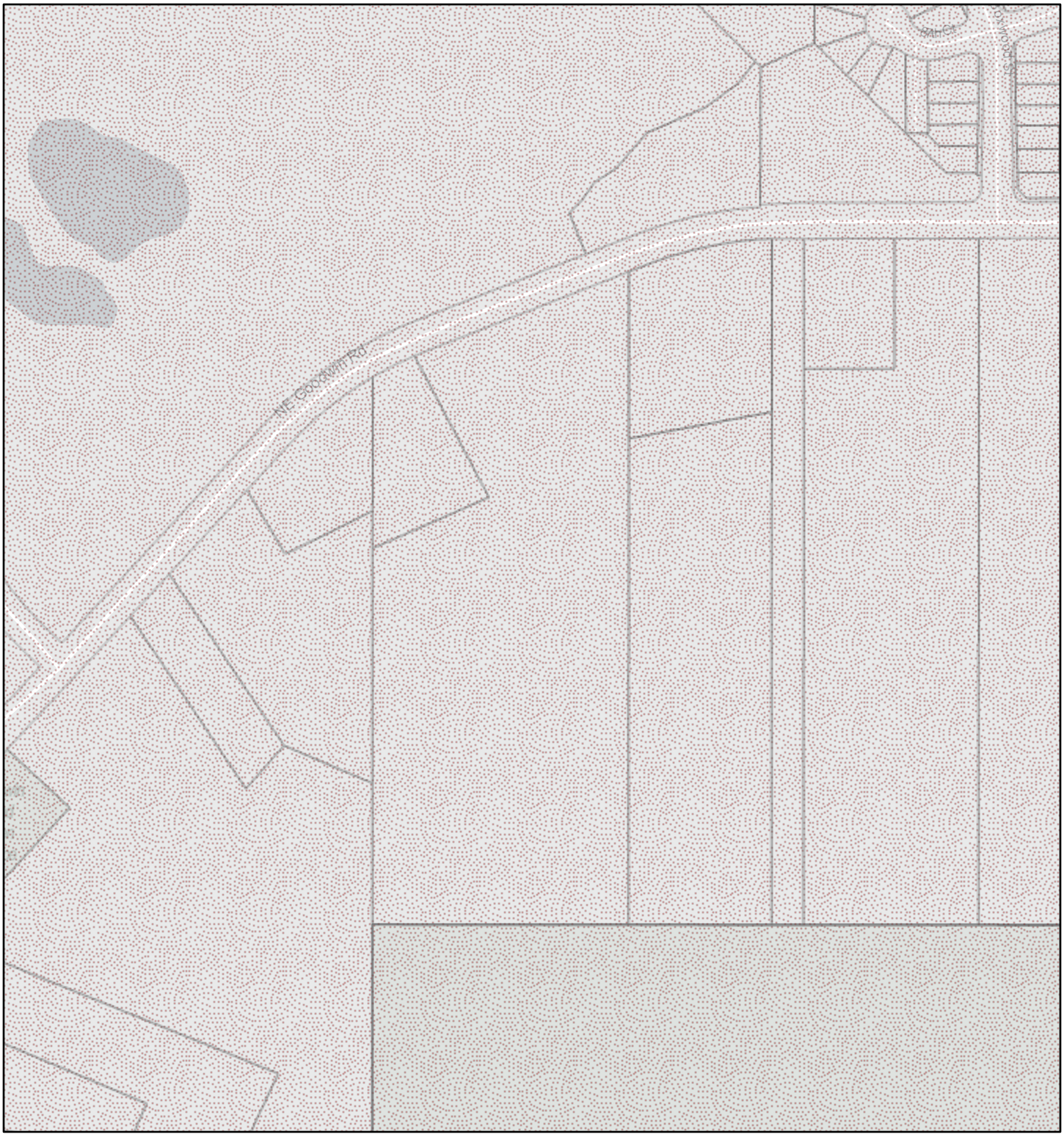
Revisions

1	
2	
3	
4	
5	
6	

Project No.	3927
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	###
DRAFTED BY:	###
REVIEWED BY:	###

1
2

Reserve at Green Mountain Critical Aquifer Recharge Area



5/12/2025

1:4,523

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.17 km

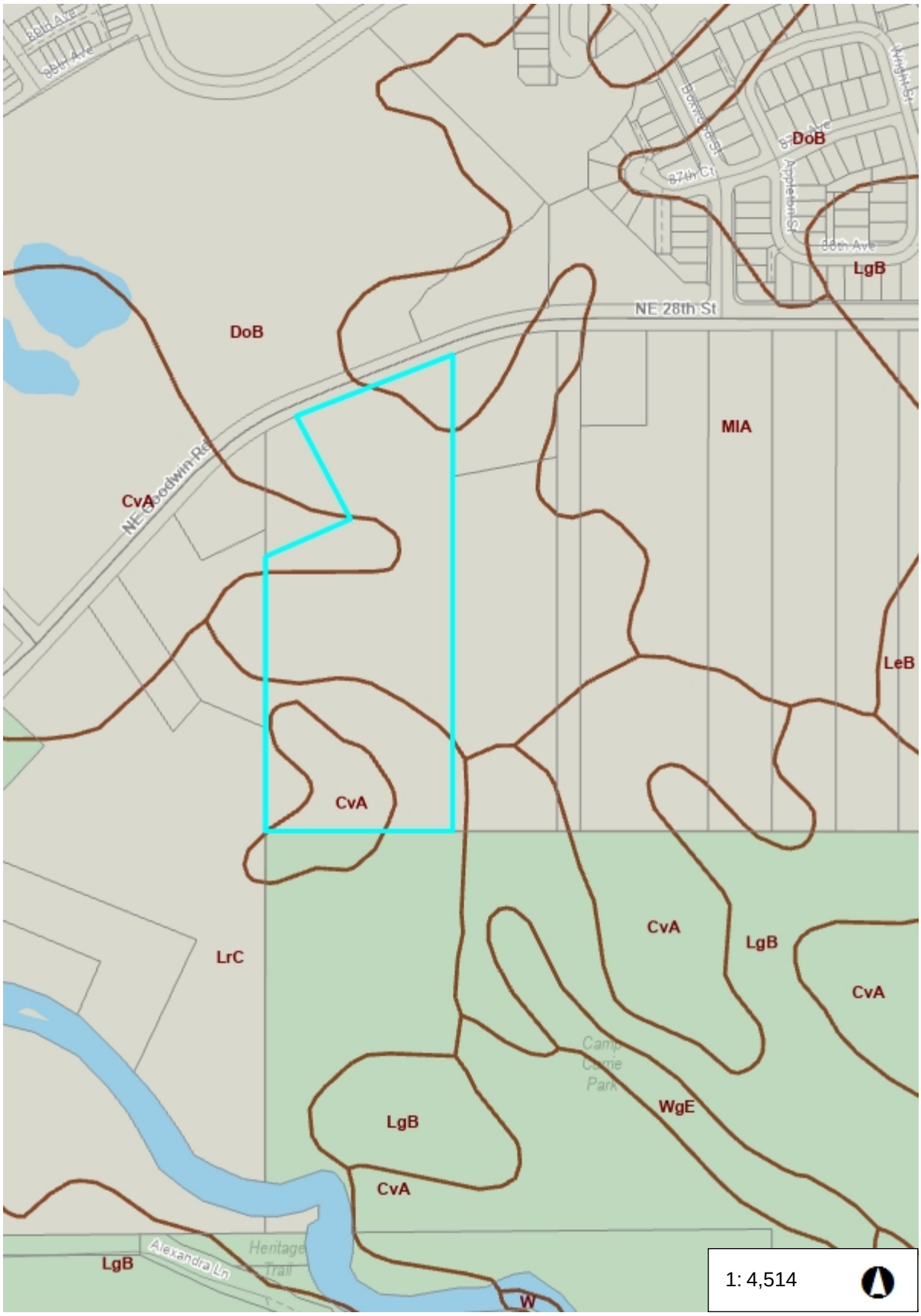
Taxlots Public

Critical Aquifer Recharge Area

Category 2 Recharge Areas

Light_Gray_Canvas_Base

County of Clark, Oregon Metro, Bureau of Land Management, State of Oregon, State of Oregon DOT, State of Oregon GEO, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA, Clark County WA





Legend

- Taxlots
- Soil Type

Notes:

752.3 0 376.17 752.3 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Tax lot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.

APPENDIX B

Design Calculations and Modeling

WWHM2012

PROJECT REPORT

General Model Information

WWHM2012 Project Name: Hydropperiod Protection Detention Pond
Site Name:
Site Address:
City:
Report Date: 5/19/2025
MGS Region:
Data Start: 1948/10/01
Data End: 2008/09/30
Timestep: 15 Minute
DOT Data Number 00
Version Date: 2023/01/27
Version: 4.2.19

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Ex Forest Offsite

Bypass: No

GroundWater: No

Pervious Land Use	acre
SG4, Forest, Mod	56.4623

Ex Roads Offsite

Bypass:	No
Impervious Land Use	acre
ROADS FLAT	1.1934

Ex Forest Onsite

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Mod	8.6377

Ex Roof Offsite

Bypass:	No
Impervious Land Use	acre
ROOF TOPS FLAT	2.3306

Ex Driveway\\Gravel Offsite

Bypass:	No
Impervious Land Use	acre
DRIVEWAYS FLAT	3.2286

Ex Field Offsite

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Field, Flat	53.9768

Lateral Basin 4

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Forest, Mod	81.0229

Mitigated Land Use

Ex Roads Offsite

Bypass:	No
Impervious Land Use	acre
ROADS FLAT	1.1934

Ex Forest Offsite

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Mod	56.4623

Ex Roof Offsite

Bypass:	No
Impervious Land Use	acre
ROOF TOPS FLAT	2.3306

Ex Driveway Offsite

Bypass:	No
Impervious Land Use	acre
DRIVEWAYS FLAT	3.2286

Lateral Basin 2

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Forest, Mod	65.2919

Ex Field Offsite

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Field, Flat	53.9768

Lateral Basin 4

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG3, Lawn, Flat	2.5194

Lateral I Basin 4

Bypass:	No
Impervious Land Use	acre
ROOF TOPS FLAT	6.1183

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length: 100.00 ft.
Bottom Width: 30.30 ft.
Depth: 5 ft.
Volume at riser head: 0.4481 acre-feet.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 3 To 1
Side slope 4: 3 To 1
Discharge Structure
Riser Height: 4 ft.
Riser Diameter: 18 in.
Notch Type: Rectangular
Notch Width: 1.000 ft.
Notch Height: 1.250 ft.
Orifice 1 Diameter: 4.500 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2
Lateral Basin 2

Pond Hydraulic Table

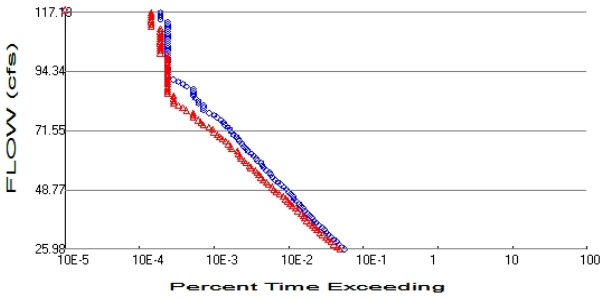
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.069	0.000	0.000	0.000
0.0556	0.070	0.003	0.129	0.000
0.1111	0.071	0.007	0.183	0.000
0.1667	0.072	0.011	0.224	0.000
0.2222	0.073	0.015	0.259	0.000
0.2778	0.074	0.020	0.289	0.000
0.3333	0.075	0.024	0.317	0.000
0.3889	0.076	0.028	0.342	0.000
0.4444	0.077	0.032	0.366	0.000
0.5000	0.078	0.037	0.388	0.000
0.5556	0.079	0.041	0.409	0.000
0.6111	0.080	0.045	0.429	0.000
0.6667	0.081	0.050	0.448	0.000
0.7222	0.083	0.055	0.467	0.000
0.7778	0.084	0.059	0.484	0.000
0.8333	0.085	0.064	0.501	0.000
0.8889	0.086	0.069	0.518	0.000
0.9444	0.087	0.073	0.534	0.000
1.0000	0.088	0.078	0.549	0.000
1.0556	0.089	0.083	0.564	0.000
1.1111	0.090	0.088	0.579	0.000
1.1667	0.091	0.093	0.593	0.000
1.2222	0.092	0.098	0.607	0.000
1.2778	0.093	0.104	0.621	0.000
1.3333	0.095	0.109	0.634	0.000
1.3889	0.096	0.114	0.647	0.000
1.4444	0.097	0.120	0.660	0.000
1.5000	0.098	0.125	0.673	0.000
1.5556	0.099	0.131	0.685	0.000
1.6111	0.100	0.136	0.697	0.000
1.6667	0.101	0.142	0.709	0.000
1.7222	0.102	0.147	0.721	0.000

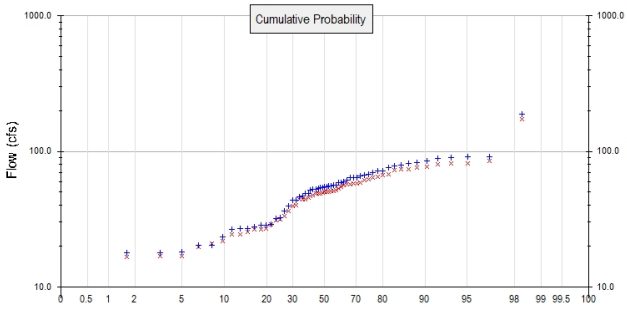
1.7778	0.104	0.153	0.732	0.000
1.8333	0.105	0.159	0.744	0.000
1.8889	0.106	0.165	0.755	0.000
1.9444	0.107	0.171	0.766	0.000
2.0000	0.108	0.177	0.777	0.000
2.0556	0.109	0.183	0.787	0.000
2.1111	0.111	0.189	0.798	0.000
2.1667	0.112	0.195	0.808	0.000
2.2222	0.113	0.201	0.819	0.000
2.2778	0.114	0.208	0.829	0.000
2.3333	0.115	0.214	0.839	0.000
2.3889	0.117	0.221	0.849	0.000
2.4444	0.118	0.227	0.859	0.000
2.5000	0.119	0.234	0.868	0.000
2.5556	0.120	0.241	0.878	0.000
2.6111	0.122	0.247	0.888	0.000
2.6667	0.123	0.254	0.897	0.000
2.7222	0.124	0.261	0.906	0.000
2.7778	0.125	0.268	0.931	0.000
2.8333	0.127	0.275	1.005	0.000
2.8889	0.128	0.282	1.106	0.000
2.9444	0.129	0.289	1.228	0.000
3.0000	0.130	0.296	1.368	0.000
3.0556	0.132	0.304	1.523	0.000
3.1111	0.133	0.311	1.691	0.000
3.1667	0.134	0.319	1.873	0.000
3.2222	0.136	0.326	2.067	0.000
3.2778	0.137	0.334	2.271	0.000
3.3333	0.138	0.341	2.486	0.000
3.3889	0.139	0.349	2.712	0.000
3.4444	0.141	0.357	2.946	0.000
3.5000	0.142	0.365	3.191	0.000
3.5556	0.143	0.373	3.443	0.000
3.6111	0.145	0.381	3.705	0.000
3.6667	0.146	0.389	3.974	0.000
3.7222	0.147	0.397	4.252	0.000
3.7778	0.149	0.405	4.537	0.000
3.8333	0.150	0.414	4.830	0.000
3.8889	0.151	0.422	5.131	0.000
3.9444	0.153	0.430	5.438	0.000
4.0000	0.154	0.439	5.752	0.000
4.0556	0.155	0.448	5.968	0.000
4.1111	0.157	0.456	6.355	0.000
4.1667	0.158	0.465	6.849	0.000
4.2222	0.160	0.474	7.419	0.000
4.2778	0.161	0.483	8.039	0.000
4.3333	0.162	0.492	8.680	0.000
4.3889	0.164	0.501	9.315	0.000
4.4444	0.165	0.510	9.915	0.000
4.5000	0.167	0.519	10.45	0.000
4.5556	0.168	0.529	10.92	0.000
4.6111	0.169	0.538	11.30	0.000
4.6667	0.171	0.548	11.59	0.000
4.7222	0.172	0.557	11.82	0.000
4.7778	0.174	0.567	12.10	0.000
4.8333	0.175	0.576	12.33	0.000
4.8889	0.177	0.586	12.55	0.000
4.9444	0.178	0.596	12.76	0.000

5.0000	0.180	0.606	12.96	0.000
5.0556	0.181	0.616	13.17	0.000

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 200.0997
Total Impervious Area: 6.7526

Mitigated Landuse Totals for POC #1
Total Pervious Area: 178.2504
Total Impervious Area: 12.8709

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	51.960228
5 year	79.150971
10 year	93.718194
25 year	108.429242
50 year	117.125046
100 year	124.251301

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	48.075756
5 year	70.378961
10 year	82.012334
25 year	93.587823
50 year	100.359271
100 year	105.873019

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	39.265	36.236
1950	51.465	46.692
1951	69.538	62.212
1952	46.999	45.366
1953	56.426	51.561
1954	75.411	68.028
1955	43.517	39.785
1956	83.087	76.549
1957	63.885	57.953
1958	59.094	56.960

1959	26.709	24.271
1960	28.777	26.570
1961	71.650	64.227
1962	58.426	53.337
1963	59.934	54.462
1964	53.989	48.852
1965	53.332	48.899
1966	63.715	57.679
1967	52.706	49.678
1968	65.368	59.001
1969	52.384	47.323
1970	188.317	171.710
1971	32.407	31.172
1972	49.049	44.506
1973	54.524	50.738
1974	78.726	72.871
1975	43.365	39.588
1976	63.524	57.201
1977	2.731	4.749
1978	88.860	80.143
1979	67.615	64.606
1980	36.258	33.157
1981	81.643	74.192
1982	55.446	50.055
1983	91.446	81.232
1984	28.681	26.426
1985	23.439	21.886
1986	27.601	25.517
1987	48.594	44.427
1988	17.941	16.615
1989	20.285	19.647
1990	20.416	20.878
1991	53.812	48.636
1992	61.070	56.569
1993	71.860	66.727
1994	54.862	49.915
1995	46.187	44.208
1996	89.990	85.320
1997	90.947	80.937
1998	78.431	73.797
1999	56.196	50.678
2000	26.939	24.242
2001	17.822	16.757
2002	84.674	75.908
2003	67.190	61.410
2004	18.128	16.863
2005	28.709	27.125
2006	55.566	50.443
2007	27.013	29.047
2008	32.090	31.309

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	**Predeveloped**	**Mitigated**
1	188.3170	171.7100
2	91.4455	85.3196
3	90.9469	81.2324
4	89.9895	80.9368

5	88.8604	80.1425
6	84.6742	76.5494
7	83.0865	75.9083
8	81.6432	74.1919
9	78.7262	73.7967
10	78.4305	72.8710
11	75.4114	68.0284
12	71.8597	66.7274
13	71.6503	64.6056
14	69.5380	64.2266
15	67.6148	62.2124
16	67.1904	61.4097
17	65.3678	59.0006
18	63.8846	57.9527
19	63.7149	57.6787
20	63.5238	57.2007
21	61.0697	56.9602
22	59.9337	56.5690
23	59.0937	54.4624
24	58.4264	53.3368
25	56.4259	51.5606
26	56.1963	50.7375
27	55.5661	50.6777
28	55.4463	50.4431
29	54.8622	50.0547
30	54.5240	49.9146
31	53.9890	49.6780
32	53.8120	48.8993
33	53.3324	48.8523
34	52.7055	48.6356
35	52.3840	47.3227
36	51.4645	46.6915
37	49.0492	45.3658
38	48.5943	44.5060
39	46.9986	44.4267
40	46.1870	44.2082
41	43.5172	39.7848
42	43.3646	39.5880
43	39.2653	36.2355
44	36.2575	33.1573
45	32.4070	31.3091
46	32.0901	31.1724
47	28.7771	29.0471
48	28.7087	27.1246
49	28.6813	26.5703
50	27.6010	26.4257
51	27.0126	25.5166
52	26.9390	24.2711
53	26.7092	24.2424
54	23.4394	21.8859
55	20.4163	20.8782
56	20.2853	19.6465
57	18.1275	16.8630
58	17.9405	16.7573
59	17.8219	16.6145
60	2.7312	4.7488

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
25.9801	1174	1024	87	Pass
26.9008	1083	931	85	Pass
27.8214	993	847	85	Pass
28.7421	914	777	85	Pass
29.6627	846	707	83	Pass
30.5834	781	669	85	Pass
31.5040	723	602	83	Pass
32.4247	673	548	81	Pass
33.3454	631	505	80	Pass
34.2660	588	473	80	Pass
35.1867	532	434	81	Pass
36.1073	498	404	81	Pass
37.0280	463	370	79	Pass
37.9486	437	346	79	Pass
38.8693	403	328	81	Pass
39.7900	372	306	82	Pass
40.7106	347	276	79	Pass
41.6313	328	261	79	Pass
42.5519	308	237	76	Pass
43.4726	291	221	75	Pass
44.3932	269	206	76	Pass
45.3139	251	192	76	Pass
46.2345	241	178	73	Pass
47.1552	222	157	70	Pass
48.0759	207	143	69	Pass
48.9965	195	132	67	Pass
49.9172	182	126	69	Pass
50.8378	166	112	67	Pass
51.7585	150	105	70	Pass
52.6791	139	95	68	Pass
53.5998	127	90	70	Pass
54.5204	120	84	70	Pass
55.4411	116	79	68	Pass
56.3618	104	75	72	Pass
57.2824	98	66	67	Pass
58.2031	93	62	66	Pass
59.1237	90	56	62	Pass
60.0444	79	53	67	Pass
60.9650	76	48	63	Pass
61.8857	71	47	66	Pass
62.8063	67	44	65	Pass
63.7270	59	43	72	Pass
64.6477	56	36	64	Pass
65.5683	53	35	66	Pass
66.4890	50	33	66	Pass
67.4096	46	30	65	Pass
68.3303	44	27	61	Pass
69.2509	42	25	59	Pass
70.1716	38	23	60	Pass
71.0923	36	21	58	Pass
72.0129	34	20	58	Pass
72.9336	32	18	56	Pass
73.8542	29	15	51	Pass

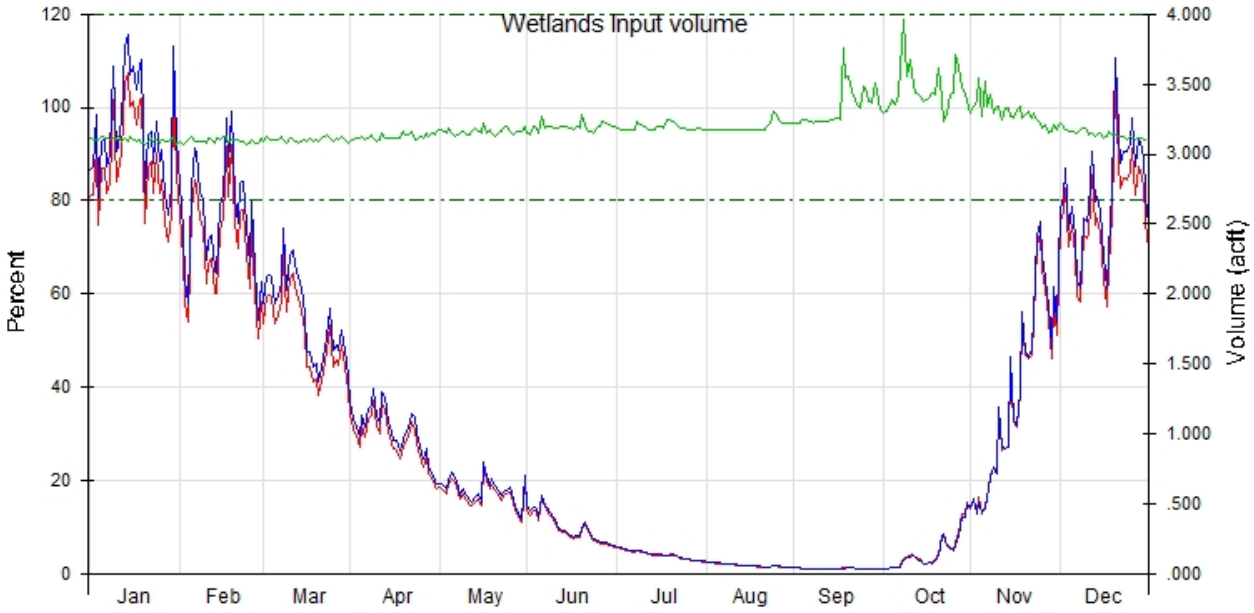
74.7749	28	14	50	Pass
75.6955	26	13	50	Pass
76.6162	23	11	47	Pass
77.5368	21	11	52	Pass
78.4575	18	11	61	Pass
79.3782	15	9	60	Pass
80.2988	15	8	53	Pass
81.2195	15	7	46	Pass
82.1401	13	6	46	Pass
83.0608	13	6	46	Pass
83.9814	12	6	50	Pass
84.9021	11	6	54	Pass
85.8227	11	5	45	Pass
86.7434	11	5	45	Pass
87.6641	11	5	45	Pass
88.5847	9	5	55	Pass
89.5054	8	5	62	Pass
90.4260	7	5	71	Pass
91.3467	6	5	83	Pass
92.2673	5	5	100	Pass
93.1880	5	5	100	Pass
94.1086	5	5	100	Pass
95.0293	5	5	100	Pass
95.9500	5	5	100	Pass
96.8706	5	5	100	Pass
97.7913	5	5	100	Pass
98.7119	5	5	100	Pass
99.6326	5	5	100	Pass
100.5532	5	5	100	Pass
101.4739	5	4	80	Pass
102.3946	5	4	80	Pass
103.3152	5	4	80	Pass
104.2359	5	4	80	Pass
105.1565	5	4	80	Pass
106.0772	5	4	80	Pass
106.9978	5	4	80	Pass
107.9185	5	4	80	Pass
108.8391	5	4	80	Pass
109.7598	5	4	80	Pass
110.6805	5	4	80	Pass
111.6011	5	3	60	Pass
112.5218	5	3	60	Pass
113.4424	5	3	60	Pass
114.3631	4	3	75	Pass
115.2837	4	3	75	Pass
116.2044	4	3	75	Pass
117.1250	4	3	75	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.738 acre-feet
On-line facility target flow:	0.8012 cfs.
Adjusted for 15 min:	0.8012 cfs.
Off-line facility target flow:	0.3651 cfs.
Adjusted for 15 min:	0.3651 cfs.

Wetland Input Volumes



- Percent - Predeveloped - Mitigated

Wetlands Input Volume for POC 1
Average Annual Volume (acft)
Series 1: 501 POC 1 Predeveloped flow
Series 2: 801 POC 1 Mitigated flow

Month	Series 1	Series 2	Percent	Pass/Fail
Jan	97.8912	91.1251	93.1	Pass
Feb	73.5771	68.2699	92.8	Pass
Mar	57.4849	53.5281	93.1	Pass
Apr	30.9501	28.9810	93.6	Pass
May	18.5413	17.5822	94.8	Pass
Jun	10.1964	9.7595	95.7	Pass
Jul	4.3738	4.1869	95.7	Pass
Aug	1.9351	1.8506	95.6	Pass
Sep	1.0843	1.0854	100.1	Pass
Oct	4.4770	4.6441	103.7	Pass
Nov	37.8162	37.0595	98.0	Pass
Dec	83.7167	78.9213	94.3	Pass

Day	Predevel	Mitigated	Percent	Pass/Fail
Jan1	2.8815	2.6954	93.5	Pass
2	2.9102	2.7120	93.2	Pass
3	3.2761	3.0479	93.0	Pass
4	2.6871	2.4983	93.0	Pass
5	3.0913	2.9011	93.8	Pass
6	3.1087	2.9024	93.4	Pass
7	2.9136	2.7185	93.3	Pass
8	2.9989	2.7950	93.2	Pass
9	3.6315	3.3863	93.2	Pass
10	3.0139	2.8028	93.0	Pass
11	3.0535	2.8651	93.8	Pass
12	3.2415	3.0102	92.9	Pass
13	3.7536	3.5110	93.5	Pass
14	3.8561	3.5796	92.8	Pass

15	3.5627	3.3369	93.7	Pass
16	3.6286	3.3761	93.0	Pass
17	3.4601	3.2133	92.9	Pass
18	3.6398	3.3907	93.2	Pass
19	3.6796	3.4013	92.4	Pass
20	2.7196	2.5011	92.0	Pass
21	3.1433	2.9163	92.8	Pass
22	3.1616	2.9504	93.3	Pass
23	2.9343	2.7175	92.6	Pass
24	3.2287	3.0069	93.1	Pass
25	2.9471	2.7164	92.2	Pass
26	3.0336	2.8174	92.9	Pass
27	2.7184	2.5202	92.7	Pass
28	2.5664	2.3767	92.6	Pass
29	2.7498	2.5626	93.2	Pass
30	3.7653	3.5335	93.8	Pass
31	3.1006	2.8532	92.0	Pass
Feb1	2.7831	2.5785	92.6	Pass
2	2.4520	2.2552	92.0	Pass
3	2.0970	1.9346	92.3	Pass
4	1.9333	1.8018	93.2	Pass
5	2.7686	2.5981	93.8	Pass
6	3.0456	2.8208	92.6	Pass
7	3.0038	2.7826	92.6	Pass
8	2.7341	2.5372	92.8	Pass
9	2.6738	2.4744	92.5	Pass
10	2.2437	2.0729	92.4	Pass
11	2.3779	2.2199	93.4	Pass
12	2.4184	2.2485	93.0	Pass
13	2.1652	2.0008	92.4	Pass
14	2.1460	2.0014	93.3	Pass
15	2.6330	2.4482	93.0	Pass
16	2.7127	2.5394	93.6	Pass
17	3.2562	3.0493	93.6	Pass
18	2.9141	2.6927	92.4	Pass
19	3.3024	3.0684	92.9	Pass
20	2.6956	2.5047	92.9	Pass
21	2.5054	2.3298	93.0	Pass
22	2.7939	2.5933	92.8	Pass
23	2.8015	2.6011	92.8	Pass
24	2.4892	2.2877	91.9	Pass
25	2.2099	2.0439	92.5	Pass
26	2.6608	2.4738	93.0	Pass
27	2.1742	2.0103	92.5	Pass
28	1.8158	1.6767	92.3	Pass
29	2.0834	1.9435	93.3	Pass
Mar1	1.9282	1.7874	92.7	Pass
2	2.1195	1.9843	93.6	Pass
3	2.1407	1.9929	93.1	Pass
4	2.1242	1.9784	93.1	Pass
5	1.9298	1.7943	93.0	Pass
6	1.9833	1.8483	93.2	Pass
7	2.0869	1.9589	93.9	Pass
8	2.4644	2.2934	93.1	Pass
9	2.0263	1.8717	92.4	Pass
10	2.2636	2.1137	93.4	Pass
11	2.3151	2.1505	92.9	Pass
12	2.2056	2.0469	92.8	Pass

13	2.1287	1.9693	92.5	Pass
14	2.0379	1.8854	92.5	Pass
15	1.8560	1.7272	93.1	Pass
16	1.5914	1.4770	92.8	Pass
17	1.5849	1.4825	93.5	Pass
18	1.4747	1.3690	92.8	Pass
19	1.5055	1.4006	93.0	Pass
20	1.3709	1.2719	92.8	Pass
21	1.4749	1.3798	93.6	Pass
22	1.6136	1.5147	93.9	Pass
23	1.6927	1.5909	94.0	Pass
24	1.8949	1.7724	93.5	Pass
25	1.5935	1.4780	92.8	Pass
26	1.6354	1.5290	93.5	Pass
27	1.5995	1.4872	93.0	Pass
28	1.7411	1.6310	93.7	Pass
29	1.5951	1.4814	92.9	Pass
30	1.4241	1.3170	92.5	Pass
31	1.2304	1.1413	92.8	Pass
Apr1	1.1103	1.0327	93.0	Pass
2	1.0533	0.9844	93.5	Pass
3	0.9762	0.9105	93.3	Pass
4	1.1365	1.0659	93.8	Pass
5	1.0516	0.9777	93.0	Pass
6	1.1797	1.1037	93.6	Pass
7	1.2071	1.1356	94.1	Pass
8	1.3270	1.2418	93.6	Pass
9	1.1371	1.0550	92.8	Pass
10	1.0738	0.9984	93.0	Pass
11	1.2958	1.2238	94.4	Pass
12	1.2582	1.1760	93.5	Pass
13	1.0816	1.0087	93.3	Pass
14	1.0088	0.9409	93.3	Pass
15	0.9564	0.8943	93.5	Pass
16	0.9488	0.8863	93.4	Pass
17	0.8793	0.8226	93.6	Pass
18	0.9493	0.9006	94.9	Pass
19	0.9959	0.9372	94.1	Pass
20	1.0384	0.9765	94.0	Pass
21	1.1401	1.0807	94.8	Pass
22	1.1161	1.0404	93.2	Pass
23	1.0144	0.9446	93.1	Pass
24	0.9001	0.8455	93.9	Pass
25	0.8205	0.7665	93.4	Pass
26	0.8952	0.8473	94.6	Pass
27	0.7647	0.7179	93.9	Pass
28	0.7313	0.6913	94.5	Pass
29	0.6718	0.6327	94.2	Pass
30	0.6389	0.6070	95.0	Pass
May1	0.6461	0.6145	95.1	Pass
2	0.6327	0.5993	94.7	Pass
3	0.6084	0.5745	94.4	Pass
4	0.6679	0.6394	95.7	Pass
5	0.7251	0.6845	94.4	Pass
6	0.6959	0.6517	93.6	Pass
7	0.6181	0.5824	94.2	Pass
8	0.5604	0.5302	94.6	Pass
9	0.6012	0.5692	94.7	Pass

10	0.5618	0.5281	94.0	Pass
11	0.5189	0.4878	94.0	Pass
12	0.5089	0.4836	95.0	Pass
13	0.5415	0.5172	95.5	Pass
14	0.5691	0.5389	94.7	Pass
15	0.5142	0.4857	94.5	Pass
16	0.8018	0.7744	96.6	Pass
17	0.7000	0.6622	94.6	Pass
18	0.6339	0.6024	95.0	Pass
19	0.6742	0.6361	94.3	Pass
20	0.6308	0.5919	93.8	Pass
21	0.6000	0.5678	94.6	Pass
22	0.5563	0.5275	94.8	Pass
23	0.5791	0.5542	95.7	Pass
24	0.5914	0.5674	95.9	Pass
25	0.6179	0.5850	94.7	Pass
26	0.5384	0.5067	94.1	Pass
27	0.4755	0.4498	94.6	Pass
28	0.4437	0.4215	95.0	Pass
29	0.3900	0.3695	94.7	Pass
30	0.6991	0.6717	96.1	Pass
31	0.4895	0.4618	94.3	Pass
Jun1	0.4465	0.4201	94.1	Pass
2	0.4755	0.4565	96.0	Pass
3	0.4654	0.4455	95.7	Pass
4	0.4049	0.3831	94.6	Pass
5	0.5631	0.5520	98.0	Pass
6	0.4931	0.4712	95.6	Pass
7	0.4812	0.4607	95.7	Pass
8	0.4380	0.4203	96.0	Pass
9	0.4065	0.3880	95.4	Pass
10	0.3626	0.3470	95.7	Pass
11	0.3212	0.3065	95.4	Pass
12	0.3091	0.2966	95.9	Pass
13	0.3036	0.2911	95.9	Pass
14	0.2907	0.2775	95.5	Pass
15	0.2751	0.2624	95.4	Pass
16	0.2624	0.2498	95.2	Pass
17	0.2671	0.2566	96.1	Pass
18	0.2734	0.2609	95.4	Pass
19	0.3197	0.3146	98.4	Pass
20	0.3721	0.3576	96.1	Pass
21	0.3235	0.3067	94.8	Pass
22	0.2772	0.2626	94.7	Pass
23	0.2487	0.2354	94.7	Pass
24	0.2350	0.2244	95.5	Pass
25	0.2254	0.2165	96.1	Pass
26	0.2234	0.2164	96.9	Pass
27	0.2203	0.2126	96.5	Pass
28	0.2151	0.2067	96.1	Pass
29	0.2071	0.1986	95.9	Pass
30	0.2011	0.1926	95.8	Pass
Jul1	0.1928	0.1840	95.4	Pass
2	0.1861	0.1773	95.3	Pass
3	0.1802	0.1715	95.2	Pass
4	0.1754	0.1670	95.2	Pass
5	0.1707	0.1625	95.2	Pass
6	0.1664	0.1584	95.2	Pass

7	0.1638	0.1562	95.4	Pass
8	0.1659	0.1608	96.9	Pass
9	0.1637	0.1576	96.3	Pass
10	0.1575	0.1508	95.8	Pass
11	0.1514	0.1446	95.5	Pass
12	0.1462	0.1394	95.4	Pass
13	0.1417	0.1351	95.3	Pass
14	0.1380	0.1316	95.3	Pass
15	0.1376	0.1321	96.1	Pass
16	0.1360	0.1305	95.9	Pass
17	0.1316	0.1259	95.7	Pass
18	0.1324	0.1288	97.2	Pass
19	0.1311	0.1275	97.3	Pass
20	0.1358	0.1315	96.9	Pass
21	0.1297	0.1254	96.7	Pass
22	0.1215	0.1165	95.9	Pass
23	0.1148	0.1097	95.6	Pass
24	0.1098	0.1048	95.4	Pass
25	0.1061	0.1012	95.4	Pass
26	0.1027	0.0979	95.3	Pass
27	0.0997	0.0950	95.3	Pass
28	0.0973	0.0927	95.4	Pass
29	0.0947	0.0904	95.4	Pass
30	0.0920	0.0877	95.3	Pass
31	0.0893	0.0850	95.2	Pass
Aug1	0.0867	0.0826	95.2	Pass
2	0.0843	0.0803	95.2	Pass
3	0.0820	0.0780	95.2	Pass
4	0.0796	0.0758	95.1	Pass
5	0.0775	0.0737	95.1	Pass
6	0.0756	0.0720	95.2	Pass
7	0.0738	0.0703	95.2	Pass
8	0.0716	0.0681	95.2	Pass
9	0.0694	0.0660	95.1	Pass
10	0.0674	0.0641	95.1	Pass
11	0.0654	0.0622	95.1	Pass
12	0.0636	0.0605	95.1	Pass
13	0.0617	0.0587	95.1	Pass
14	0.0606	0.0577	95.2	Pass
15	0.0592	0.0564	95.2	Pass
16	0.0573	0.0546	95.2	Pass
17	0.0555	0.0528	95.1	Pass
18	0.0541	0.0515	95.1	Pass
19	0.0537	0.0512	95.3	Pass
20	0.0520	0.0495	95.3	Pass
21	0.0502	0.0479	95.3	Pass
22	0.0504	0.0483	95.9	Pass
23	0.0512	0.0495	96.7	Pass
24	0.0537	0.0533	99.2	Pass
25	0.0553	0.0543	98.3	Pass
26	0.0521	0.0507	97.3	Pass
27	0.0484	0.0468	96.7	Pass
28	0.0459	0.0443	96.7	Pass
29	0.0446	0.0431	96.7	Pass
30	0.0430	0.0416	96.6	Pass
31	0.0427	0.0412	96.6	Pass
Sep1	0.0416	0.0402	96.6	Pass
2	0.0403	0.0389	96.6	Pass

3	0.0397	0.0387	97.3	Pass
4	0.0389	0.0379	97.3	Pass
5	0.0376	0.0365	97.0	Pass
6	0.0364	0.0352	96.9	Pass
7	0.0353	0.0342	96.8	Pass
8	0.0347	0.0337	97.0	Pass
9	0.0343	0.0333	97.1	Pass
10	0.0338	0.0328	97.1	Pass
11	0.0328	0.0318	97.0	Pass
12	0.0320	0.0311	97.1	Pass
13	0.0317	0.0308	97.2	Pass
14	0.0327	0.0319	97.5	Pass
15	0.0321	0.0313	97.6	Pass
16	0.0315	0.0307	97.5	Pass
17	0.0388	0.0438	112.9	Pass
18	0.0396	0.0420	106.2	Pass
19	0.0425	0.0454	106.6	Pass
20	0.0439	0.0454	103.6	Pass
21	0.0393	0.0399	101.6	Pass
22	0.0359	0.0361	100.5	Pass
23	0.0340	0.0339	99.9	Pass
24	0.0347	0.0362	104.5	Pass
25	0.0355	0.0367	103.5	Pass
26	0.0334	0.0338	101.2	Pass
27	0.0317	0.0319	100.8	Pass
28	0.0333	0.0350	105.1	Pass
29	0.0336	0.0350	104.0	Pass
30	0.0375	0.0373	99.6	Pass
Oct1	0.0369	0.0364	98.7	Pass
2	0.0369	0.0367	99.2	Pass
3	0.0378	0.0378	100.0	Pass
4	0.0424	0.0430	101.5	Pass
5	0.0441	0.0443	100.6	Pass
6	0.0446	0.0458	102.6	Pass
7	0.0519	0.0563	108.5	Pass
8	0.0890	0.1058	118.8	Pass
9	0.1135	0.1212	106.8	Pass
10	0.1176	0.1295	110.2	Pass
11	0.1279	0.1373	107.3	Pass
12	0.1145	0.1179	103.0	Pass
13	0.0972	0.1000	102.8	Pass
14	0.0865	0.0882	102.0	Pass
15	0.0731	0.0740	101.2	Pass
16	0.0700	0.0711	101.5	Pass
17	0.0787	0.0807	102.5	Pass
18	0.0753	0.0777	103.2	Pass
19	0.0929	0.0954	102.6	Pass
20	0.1266	0.1374	108.6	Pass
21	0.2636	0.2687	101.9	Pass
22	0.2790	0.2708	97.1	Pass
23	0.2064	0.2032	98.5	Pass
24	0.1831	0.1884	102.9	Pass
25	0.1611	0.1661	103.1	Pass
26	0.2015	0.2246	111.4	Pass
27	0.2707	0.2944	108.7	Pass
28	0.4069	0.4236	104.1	Pass
29	0.4063	0.4189	103.1	Pass
30	0.5035	0.5119	101.7	Pass

31	0.4699	0.4635	98.6	Pass
Nov1	0.5299	0.5311	100.2	Pass
2	0.4232	0.4287	101.3	Pass
3	0.5163	0.5484	106.2	Pass
4	0.4342	0.4264	98.2	Pass
5	0.4655	0.4919	105.7	Pass
6	0.5363	0.5370	100.1	Pass
7	0.6859	0.7038	102.6	Pass
8	0.7682	0.7592	98.8	Pass
9	0.7194	0.7209	100.2	Pass
10	1.1935	1.1952	100.1	Pass
11	0.9104	0.8872	97.5	Pass
12	0.8976	0.8953	99.7	Pass
13	0.9102	0.9078	99.7	Pass
14	1.5473	1.5151	97.9	Pass
15	1.1110	1.0837	97.5	Pass
16	1.0598	1.0544	99.5	Pass
17	1.2940	1.2974	100.3	Pass
18	1.8702	1.8301	97.9	Pass
19	1.5883	1.5644	98.5	Pass
20	1.5486	1.5341	99.1	Pass
21	1.5934	1.5585	97.8	Pass
22	1.8321	1.8082	98.7	Pass
23	2.4125	2.3499	97.4	Pass
24	2.5169	2.4283	96.5	Pass
25	2.2829	2.1812	95.5	Pass
26	2.1149	2.0345	96.2	Pass
27	1.9230	1.8189	94.6	Pass
28	1.6155	1.5339	94.9	Pass
29	2.0507	1.9751	96.3	Pass
30	1.7972	1.7090	95.1	Pass
Dec1	2.6008	2.5140	96.7	Pass
2	2.6925	2.5855	96.0	Pass
3	2.8982	2.7577	95.1	Pass
4	2.4554	2.3323	95.0	Pass
5	2.6218	2.4890	94.9	Pass
6	2.4130	2.2828	94.6	Pass
7	2.1000	1.9857	94.6	Pass
8	2.0366	1.9411	95.3	Pass
9	2.5362	2.4267	95.7	Pass
10	2.5179	2.3979	95.2	Pass
11	2.5873	2.4381	94.2	Pass
12	3.0131	2.8482	94.5	Pass
13	2.6645	2.4941	93.6	Pass
14	2.6979	2.5350	94.0	Pass
15	2.5904	2.4495	94.6	Pass
16	2.2658	2.1149	93.3	Pass
17	2.0355	1.9065	93.7	Pass
18	2.3133	2.1970	95.0	Pass
19	2.7339	2.5685	93.9	Pass
20	3.6809	3.4694	94.3	Pass
21	3.1463	2.9496	93.7	Pass
22	2.9367	2.7557	93.8	Pass
23	3.0210	2.8293	93.7	Pass
24	3.0203	2.8112	93.1	Pass
25	3.0608	2.8716	93.8	Pass
26	3.2525	3.0408	93.5	Pass
27	2.9085	2.7062	93.0	Pass

28	3.1116	2.9102	93.5	Pass
29	3.0420	2.8444	93.5	Pass
30	2.9632	2.7574	93.1	Pass
31	2.5365	2.3636	93.2	Pass

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1	☐	1398.48			☐	0.00			
Total Volume Infiltrated		1398.48	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

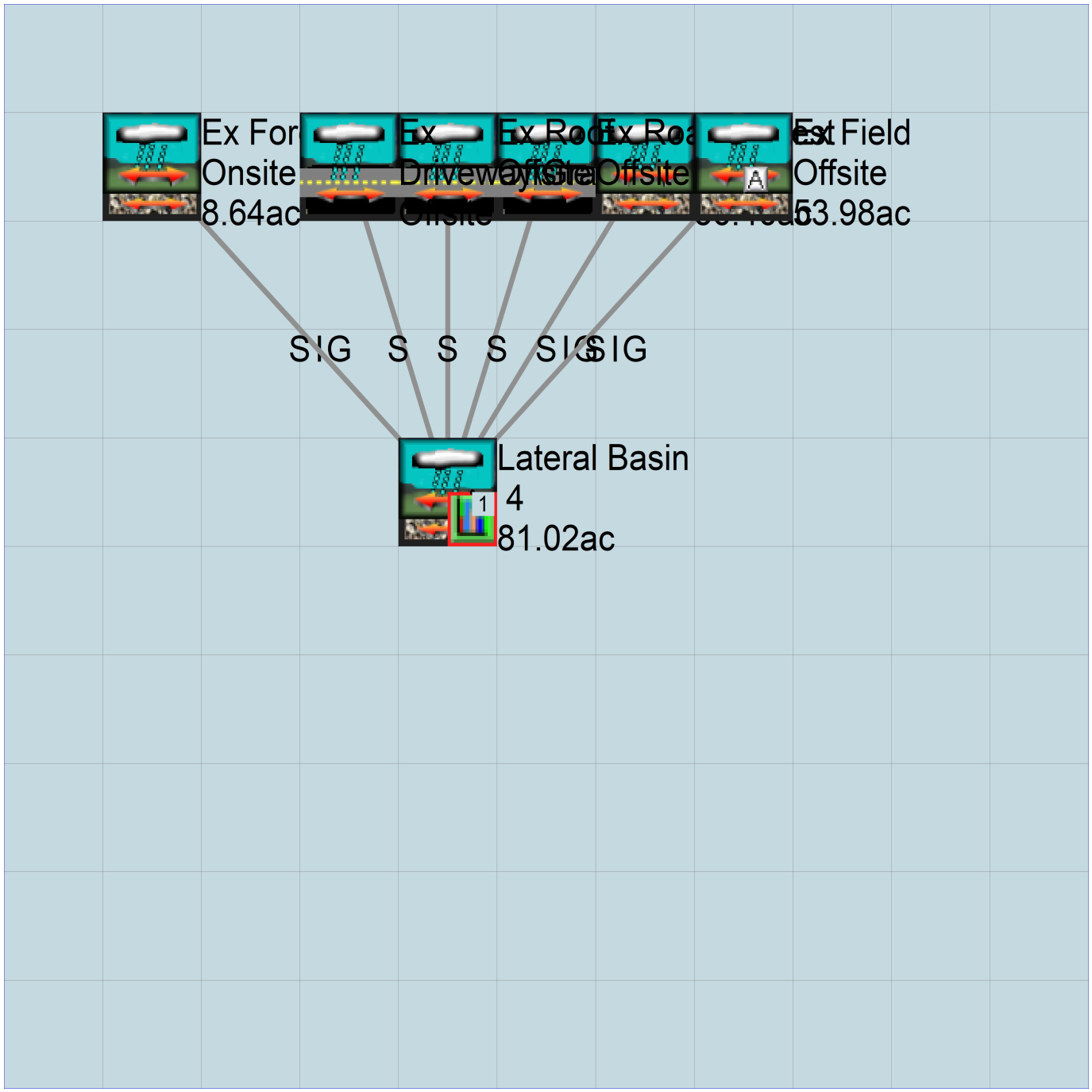
No PERLND changes have been made.

IMPLND Changes

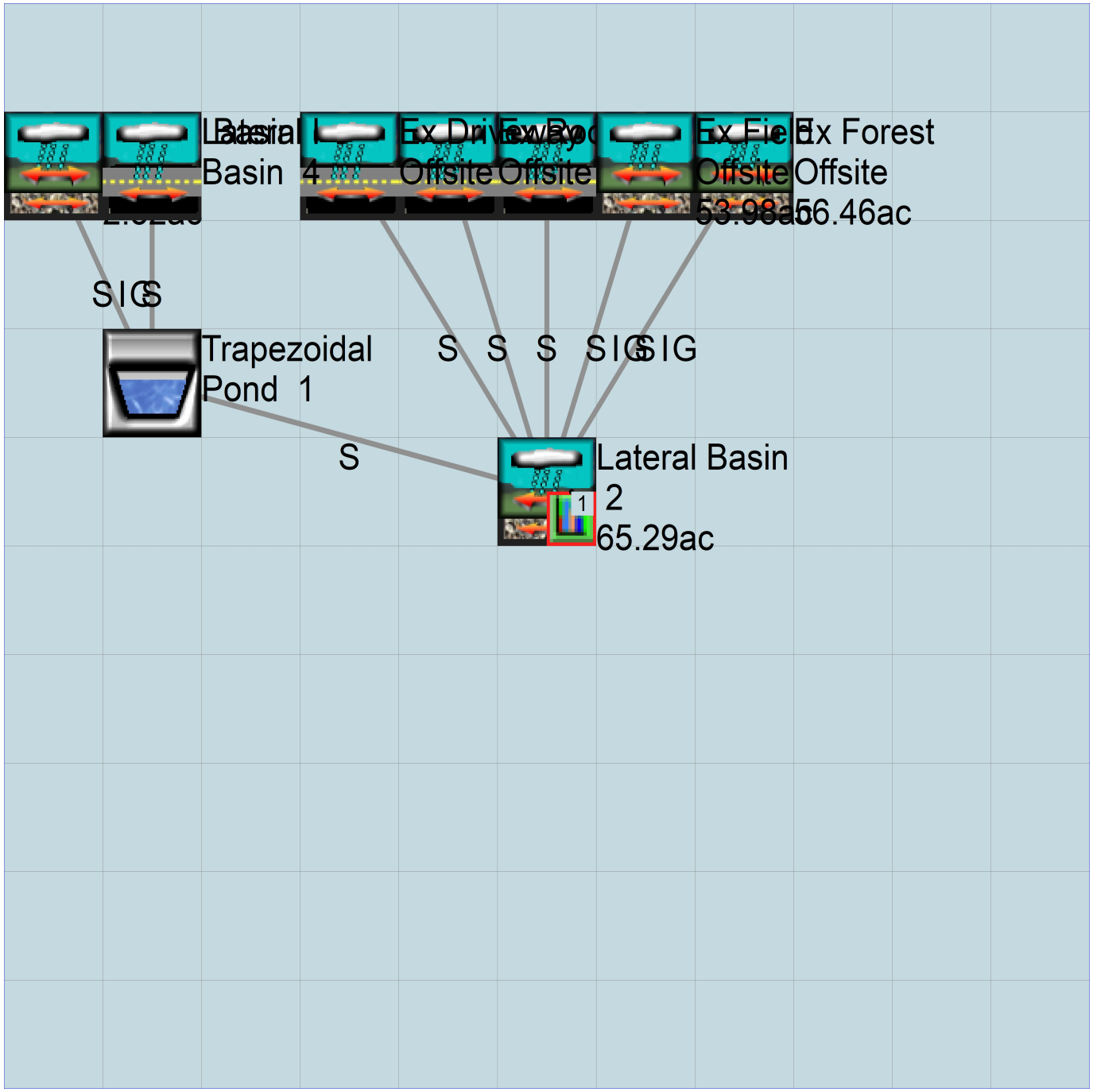
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Hydropperiod Protection Detention Pond.wdm
MESSU       25   PreHydropperiod Protection Detention Pond.MES
            27   PreHydropperiod Protection Detention Pond.L61
            28   PreHydropperiod Protection Detention Pond.L62
            30   POCHydropperiod Protection Detention Pond1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      48
      IMPLND      17
      PERLND      49
      IMPLND      18
      IMPLND      19
      PERLND      52
      PERLND      56
      COPY       501
      COPY         1
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Lateral Basin  4           MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out            ***
   48     SG4, Forest, Mod        1    1    1    1   27    0
   49     SG4, Forest, Mod        1    1    1    1   27    0
   52     SG4, Field, Flat        1    1    1    1   27    0
   56     SG4, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
```

```
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   48         0    0    1    0    0    0    0    0    0    0    0    0
   49         0    0    1    0    0    0    0    0    0    0    0    0
   52         0    0    1    0    0    0    0    0    0    0    0    0
   56         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   48         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   49         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   52         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   56         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   48         0    0    0    0    0    0    0    0    0    0    0
   49         0    0    0    0    0    0    0    0    0    0    0
   52         0    0    0    0    0    0    0    0    0    0    0
   56         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   48              0         6      0.04       400       0.1         0      0.96
   49              0         6      0.04       400       0.1         0      0.96
   52              0         6      0.03       400      0.05         0      0.96
   56              0         6      0.04       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   48              0         0         3         2         0         0         0
   49              0         0         3         2         0         0         0
   52              0         0         3         2         0         0         0
   56              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   48           0.2       0.4      0.35         2       0.4       0.7
   49           0.2       0.4      0.35         2       0.4       0.7
   52          0.15       0.4       0.3         2       0.4       0.4
   56           0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS       IFWS       LZS       AGWS      GWVS
   48              0         0         0         0       2.5          1         0
   49              0         0         0         0       2.5          1         0
   52              0         0         0         0       2.5          1         0
   56              0         0         0         0       2.5          1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
   17      ROADS/FLAT             1    1    1   27    0
   18      ROOF TOPS/FLAT         1    1    1   27    0
```

```
  19      DRIVEWAYS/FLAT         1    1    1   27    0
END GEN-INFO
*** Section IWATER***

ACTIVITY
  <PLS > ************ Active Sections ******************************
  # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
 17         0    0    1    0    0    0
 18         0    0    1    0    0    0
 19         0    0    1    0    0    0
END ACTIVITY

PRINT-INFO
  <ILS > ******** Print-flags ******** PIVL  PYR
  # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
 17         0    0    4    0    0    0    1    9
 18         0    0    4    0    0    0    1    9
 19         0    0    4    0    0    0    1    9
END PRINT-INFO

IWAT-PARM1
  <PLS >  IWATER variable monthly parameter value flags  ***
  # -  # CSNO RTOP  VRS  VNN RTLI     ***
 17         0    0    0    0    0
 18         0    0    0    0    0
 19         0    0    0    0    0
END IWAT-PARM1

IWAT-PARM2
  <PLS >      IWATER input info: Part 2         ***
  # -  # ***  LSUR     SLSUR      NSUR     RETSC
 17          400      0.01       0.1        0.1
 18          400      0.01       0.1        0.1
 19          400      0.01       0.1        0.1
END IWAT-PARM2

IWAT-PARM3
  <PLS >      IWATER input info: Part 3         ***
  # -  # ***PETMAX    PETMIN
 17             0         0
 18             0         0
 19             0         0
END IWAT-PARM3

IWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
  # -  # ***  RETS      SURS
 17             0         0
 18             0         0
 19             0         0
END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                <--Area-->     <-Target->   MBLK   ***
<Name>   #                <-factor->     <Name>   #   Tbl#   ***
Ex Forest Offsite***
PERLND  48                    0.6969     PERLND  56     30
PERLND  48                    0.6969     PERLND  56     34
PERLND  48                    0.6969     PERLND  56     38
Ex Roads Offsite***
IMPLND  17                    0.0147     PERLND  56     50
Ex Forest Onsite***
PERLND  49                    0.1066     PERLND  56     30
PERLND  49                    0.1066     PERLND  56     34
PERLND  49                    0.1066     PERLND  56     38
Ex Roof Offsite***
IMPLND  18                    0.0288     PERLND  56     50
Ex Driveway\\Gravel Offsite***
```

```
IMPLND  19                      0.0398     PERLND  56     50
Ex Field Offsite***
PERLND  52                      0.6662     PERLND  56     30
PERLND  52                      0.6662     PERLND  56     34
PERLND  52                      0.6662     PERLND  56     38
Lateral Basin  4***
PERLND  56                     81.0229     COPY   501     12
PERLND  56                     81.0229     COPY   501     13
PERLND  56                     81.0229     COPY   501     14

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                     in  out                                ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
```

```
WDM      2 PREC     ENGL    1.3             IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     0 OUTPUT MEAN     1     48.4      WDM   1000 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       14
PERLND     PWATER AGWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   14

  MASS-LINK       30
PERLND     PWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   30

  MASS-LINK       34
PERLND     PWATER IFWO                     PERLND         EXTNL  IFWLI
  END MASS-LINK   34

  MASS-LINK       38
PERLND     PWATER AGWO                     PERLND         EXTNL  AGWLI
  END MASS-LINK   38

  MASS-LINK       50
IMPLND     IWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   50


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Hydropperiod Protection Detention Pond.wdm
MESSU       25   MitHydropperiod Protection Detention Pond.MES
            27   MitHydropperiod Protection Detention Pond.L61
            28   MitHydropperiod Protection Detention Pond.L62
            30   POCHydropperiod Protection Detention Pond1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      IMPLND      16
      PERLND      47
      IMPLND      20
      IMPLND      21
      PERLND      53
      PERLND      55
      IMPLND      22
      RCHRES       1
      PERLND      50
      COPY       501
      COPY         1
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Lateral Basin  2            MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   47     SG4, Forest, Mod        1    1    1    1   27    0
   53     SG4, Field, Flat        1    1    1    1   27    0
   55     SG3, Lawn, Flat         1    1    1    1   27    0
   50     SG4, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***
```

```
  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   47         0    0    1    0    0    0    0    0    0    0    0    0
   53         0    0    1    0    0    0    0    0    0    0    0    0
   55         0    0    1    0    0    0    0    0    0    0    0    0
   50         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   47         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   53         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   55         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   50         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   47         0    0    0    0    0    0    0    0    0    0    0
   53         0    0    0    0    0    0    0    0    0    0    0
   55         0    0    0    0    0    0    0    0    0    0    0
   50         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   47              0         6      0.04       400       0.1         0      0.96
   53              0         6      0.03       400      0.05         0      0.96
   55              0         9      0.05       400      0.05         0      0.96
   50              0         6      0.04       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   47              0         0         3         2         0         0         0
   53              0         0         3         2         0         0         0
   55              0         0       2.5         2         0         0         0
   50              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                  ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   47            0.2       0.4      0.35         2       0.4       0.7
   53           0.15       0.4       0.3         2       0.4       0.4
   55            0.1       0.8      0.25         4       0.4      0.25
   50            0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS       AGWS      GWVS
   47              0         0         0         0       2.5          1         0
   53              0         0         0         0       2.5          1         0
   55              0         0         0         0         3          1         0
   50              0         0         0         0       2.5          1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
```

```
  16      ROADS/FLAT             1    1    1   27    0
  20      ROOF TOPS/FLAT         1    1    1   27    0
  21      DRIVEWAYS/FLAT         1    1    1   27    0
  22      ROOF TOPS/FLAT         1    1    1   27    0
END GEN-INFO
*** Section IWATER***

ACTIVITY
  <PLS > ************ Active Sections ******************************
  # -  # ATMP SNOW IWAT  SLD  IWG IQAL    ***
 16         0    0    1    0    0    0
 20         0    0    1    0    0    0
 21         0    0    1    0    0    0
 22         0    0    1    0    0    0
END ACTIVITY

PRINT-INFO
  <ILS > ******** Print-flags ******** PIVL  PYR
  # -  # ATMP SNOW IWAT  SLD  IWG IQAL     *********
 16         0    0    4    0    0    0    1    9
 20         0    0    4    0    0    0    1    9
 21         0    0    4    0    0    0    1    9
 22         0    0    4    0    0    0    1    9
END PRINT-INFO

IWAT-PARM1
  <PLS >  IWATER variable monthly parameter value flags  ***
  # -  # CSNO RTOP  VRS  VNN RTLI     ***
 16         0    0    0    0    0
 20         0    0    0    0    0
 21         0    0    0    0    0
 22         0    0    0    0    0
END IWAT-PARM1

IWAT-PARM2
  <PLS >      IWATER input info: Part 2         ***
  # -  # ***  LSUR     SLSUR      NSUR     RETSC
 16          400      0.01       0.1        0.1
 20          400      0.01       0.1        0.1
 21          400      0.01       0.1        0.1
 22          400      0.01       0.1        0.1
END IWAT-PARM2

IWAT-PARM3
  <PLS >      IWATER input info: Part 3         ***
  # -  # ***PETMAX    PETMIN
 16             0         0
 20             0         0
 21             0         0
 22             0         0
END IWAT-PARM3

IWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
  # -  # ***  RETS      SURS
 16             0         0
 20             0         0
 21             0         0
 22             0         0
END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Ex Roads Offsite***
IMPLND  16                     0.0183     PERLND  50     50
Ex Forest Offsite***
PERLND  47                     0.8648     PERLND  50     30
```

```
PERLND  47                      0.8648     PERLND  50     34
PERLND  47                      0.8648     PERLND  50     38
Ex Roof Offsite***
IMPLND  20                      0.0357     PERLND  50     50
Ex Driveway Offsite***
IMPLND  21                      0.0494     PERLND  50     50
Ex Field Offsite***
PERLND  53                      0.8267     PERLND  50     30
PERLND  53                      0.8267     PERLND  50     34
PERLND  53                      0.8267     PERLND  50     38
Lateral Basin  4***
PERLND  55                      2.5194     RCHRES   1      2
PERLND  55                      2.5194     RCHRES   1      3
PERLND  55                      2.5194     RCHRES   1      4
Lateral I Basin  4***
IMPLND  22                      6.1183     RCHRES   1      5
Lateral Basin  2***
PERLND  50                     65.2919     COPY   501     12
PERLND  50                     65.2919     COPY   501     13
PERLND  50                     65.2919     COPY   501     14

******Routing******
IMPLND  16                      1.1934     COPY     1     15
PERLND  47                     56.4623     COPY     1     12
PERLND  47                     56.4623     COPY     1     13
PERLND  47                     56.4623     COPY     1     14
IMPLND  20                      2.3306     COPY     1     15
IMPLND  21                      3.2286     COPY     1     15
PERLND  53                     53.9768     COPY     1     12
PERLND  53                     53.9768     COPY     1     13
PERLND  53                     53.9768     COPY     1     14
RCHRES   1                       .0153     PERLND  50     60
RCHRES   1                                 COPY     1     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
                                       in  out                              ***
    1     Trapezoidal Pond-023    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
```

```
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0        2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1               1      0.02       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.069559  0.000000  0.000000
  0.055556  0.070559  0.003892  0.129523
  0.111111  0.071564  0.007840  0.183173
  0.166667  0.072573  0.011844  0.224341
  0.222222  0.073588  0.015904  0.259046
  0.277778  0.074608  0.020020  0.289623
  0.333333  0.075634  0.024194  0.317266
  0.388889  0.076664  0.028424  0.342686
  0.444444  0.077699  0.032712  0.366347
  0.500000  0.078740  0.037058  0.388570
  0.555556  0.079785  0.041461  0.409588
  0.611111  0.080836  0.045923  0.429580
  0.666667  0.081892  0.050443  0.448681
  0.722222  0.082953  0.055022  0.467002
  0.777778  0.084018  0.059660  0.484631
  0.833333  0.085090  0.064358  0.501641
  0.888889  0.086166  0.069115  0.518093
  0.944444  0.087247  0.073932  0.534038
  1.000000  0.088333  0.078809  0.549520
  1.055556  0.089425  0.083747  0.564578
  1.111111  0.090521  0.088745  0.579245
  1.166667  0.091623  0.093805  0.593550
  1.222222  0.092730  0.098926  0.607518
  1.277778  0.093842  0.104108  0.621171
  1.333333  0.094959  0.109353  0.634531
  1.388889  0.096081  0.114659  0.647616
  1.444444  0.097208  0.120028  0.660441
  1.500000  0.098340  0.125460  0.673022
  1.555556  0.099478  0.130955  0.685372
  1.611111  0.100620  0.136514  0.697504
  1.666667  0.101768  0.142135  0.709428
  1.722222  0.102920  0.147821  0.721155
  1.777778  0.104078  0.153571  0.732694
  1.833333  0.105241  0.159386  0.744054
  1.888889  0.106409  0.165265  0.755243
  1.944444  0.107582  0.171209  0.766269
  2.000000  0.108760  0.177218  0.777139
  2.055556  0.109944  0.183294  0.787859
  2.111111  0.111132  0.189435  0.798435
  2.166667  0.112326  0.195642  0.808872
  2.222222  0.113524  0.201915  0.819177
  2.277778  0.114728  0.208256  0.829353
  2.333333  0.115937  0.214663  0.839406
  2.388889  0.117151  0.221138  0.849340
```

```
  2.444444  0.118370  0.227680  0.859160
  2.500000  0.119594  0.234290  0.868868
  2.555556  0.120823  0.240968  0.878469
  2.611111  0.122057  0.247715  0.887966
  2.666667  0.123297  0.254530  0.897363
  2.722222  0.124541  0.261415  0.906662
  2.777778  0.125791  0.268368  0.931284
  2.833333  0.127045  0.275392  1.005088
  2.888889  0.128305  0.282485  1.106369
  2.944444  0.129570  0.289648  1.228464
  3.000000  0.130840  0.296881  1.368047
  3.055556  0.132115  0.304186  1.523014
  3.111111  0.133396  0.311561  1.691875
  3.166667  0.134681  0.319008  1.873506
  3.222222  0.135971  0.326526  2.067016
  3.277778  0.137267  0.334116  2.271681
  3.333333  0.138567  0.341778  2.486891
  3.388889  0.139873  0.349512  2.712130
  3.444444  0.141184  0.357319  2.946950
  3.500000  0.142500  0.365199  3.190957
  3.555556  0.143821  0.373153  3.443803
  3.611111  0.145147  0.381180  3.705177
  3.666667  0.146478  0.389280  3.974798
  3.722222  0.147815  0.397455  4.252411
  3.777778  0.149156  0.405704  4.537785
  3.833333  0.150503  0.414028  4.830705
  3.888889  0.151854  0.422427  5.130977
  3.944444  0.153211  0.430901  5.438417
  4.000000  0.154573  0.439451  5.752857
  4.055556  0.155940  0.448076  5.968734
  4.111111  0.157312  0.456778  6.355822
  4.166667  0.158689  0.465555  6.849790
  4.222222  0.160071  0.474410  7.419918
  4.277778  0.161459  0.483341  8.039214
  4.333333  0.162851  0.492350  8.680254
  4.388889  0.164249  0.501436  9.314964
  4.444444  0.165651  0.510600  9.915940
  4.500000  0.167059  0.519842  10.45862
  4.555556  0.168472  0.529162  10.92405
  4.611111  0.169890  0.538561  11.30217
  4.666667  0.171313  0.548039  11.59541
  4.722222  0.172741  0.557596  11.82272
  4.777778  0.174175  0.567233  12.10482
  4.833333  0.175613  0.576949  12.33114
  4.888889  0.177056  0.586745  12.55023
  4.944444  0.178505  0.596622  12.76274
  5.000000  0.179959  0.606579  12.96925
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
```

```
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        4
PERLND     PWATER AGWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    4

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       14
PERLND     PWATER AGWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   14

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16

  MASS-LINK       30
PERLND     PWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   30

  MASS-LINK       34
PERLND     PWATER IFWO                     PERLND         EXTNL  IFWLI
  END MASS-LINK   34

  MASS-LINK       38
PERLND     PWATER AGWO                     PERLND         EXTNL  AGWLI
  END MASS-LINK   38

  MASS-LINK       50
IMPLND     IWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   50

  MASS-LINK       60
RCHRES     ROFLOW            12.00000      PERLND         EXTNL  SURLI
  END MASS-LINK   60


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

Legal Notice

This program and accompanying documentation are provided 'as-is' without warranty of any kind. The entire risk regarding the performance and results of this program is assumed by End User. Clear Creek Solutions Inc. and the governmental licensee or sublicensees disclaim all warranties, either expressed or implied, including but not limited to implied warranties of program and accompanying documentation. In no event shall Clear Creek Solutions Inc. be liable for any damages whatsoever (including without limitation to damages for loss of business profits, loss of business information, business interruption, and the like) arising out of the use of, or inability to use this program even if Clear Creek Solutions Inc. or their authorized representatives have been advised of the possibility of such damages. Software Copyright © by : Clear Creek Solutions, Inc. 2005-2025; All Rights Reserved.

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

WWHM2012

PROJECT REPORT

General Model Information

WWHM2012 Project Name: Basin 1
Site Name:
Site Address:
City:

Report Date:	5/12/2025
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.300
Version Date:	2023/01/27
Version:	4.2.19

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Mod	8.6377
Pervious Total	8.6377
Impervious Land Use	acre
Impervious Total	0
Basin Total	8.6377

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG3, Lawn, Flat	2.5194
Pervious Total	2.5194

Impervious Land Use	acre
ROADS FLAT	1.342
ROOF TOPS FLAT	4.0645
DRIVEWAYS FLAT	0.3809
SIDEWALKS FLAT	0.3309
Impervious Total	6.1183
Basin Total	8.6377

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length:	100.00 ft.
Bottom Width:	30.30 ft.
Depth:	5 ft.
Volume at riser head:	0.4481 acre-feet.
Side slope 1:	3 To 1
Side slope 2:	3 To 1
Side slope 3:	3 To 1
Side slope 4:	3 To 1
Discharge Structure	
Riser Height:	4 ft.
Riser Diameter:	18 in.
Notch Type:	Rectangular
Notch Width:	1.000 ft.
Notch Height:	1.250 ft.
Orifice 1 Diameter:	4.500 in. Elevation:0 ft.
Element Flows To:	
Outlet 1	Outlet 2

Pond Hydraulic Table

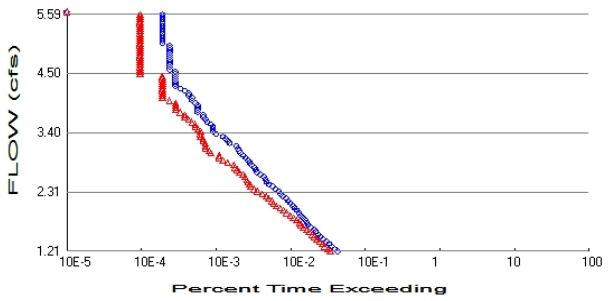
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.069	0.000	0.000	0.000
0.0556	0.070	0.003	0.129	0.000
0.1111	0.071	0.007	0.183	0.000
0.1667	0.072	0.011	0.224	0.000
0.2222	0.073	0.015	0.259	0.000
0.2778	0.074	0.020	0.289	0.000
0.3333	0.075	0.024	0.317	0.000
0.3889	0.076	0.028	0.342	0.000
0.4444	0.077	0.032	0.366	0.000
0.5000	0.078	0.037	0.388	0.000
0.5556	0.079	0.041	0.409	0.000
0.6111	0.080	0.045	0.429	0.000
0.6667	0.081	0.050	0.448	0.000
0.7222	0.083	0.055	0.467	0.000
0.7778	0.084	0.059	0.484	0.000
0.8333	0.085	0.064	0.501	0.000
0.8889	0.086	0.069	0.518	0.000
0.9444	0.087	0.073	0.534	0.000
1.0000	0.088	0.078	0.549	0.000
1.0556	0.089	0.083	0.564	0.000
1.1111	0.090	0.088	0.579	0.000
1.1667	0.091	0.093	0.593	0.000
1.2222	0.092	0.098	0.607	0.000
1.2778	0.093	0.104	0.621	0.000
1.3333	0.095	0.109	0.634	0.000
1.3889	0.096	0.114	0.647	0.000
1.4444	0.097	0.120	0.660	0.000
1.5000	0.098	0.125	0.673	0.000
1.5556	0.099	0.131	0.685	0.000
1.6111	0.100	0.136	0.697	0.000
1.6667	0.101	0.142	0.709	0.000
1.7222	0.102	0.147	0.721	0.000

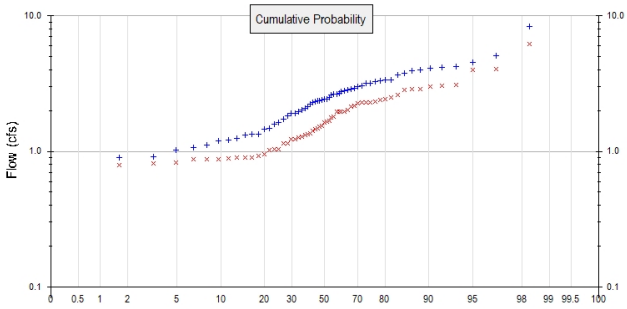
1.7778	0.104	0.153	0.732	0.000
1.8333	0.105	0.159	0.744	0.000
1.8889	0.106	0.165	0.755	0.000
1.9444	0.107	0.171	0.766	0.000
2.0000	0.108	0.177	0.777	0.000
2.0556	0.109	0.183	0.787	0.000
2.1111	0.111	0.189	0.798	0.000
2.1667	0.112	0.195	0.808	0.000
2.2222	0.113	0.201	0.819	0.000
2.2778	0.114	0.208	0.829	0.000
2.3333	0.115	0.214	0.839	0.000
2.3889	0.117	0.221	0.849	0.000
2.4444	0.118	0.227	0.859	0.000
2.5000	0.119	0.234	0.868	0.000
2.5556	0.120	0.241	0.878	0.000
2.6111	0.122	0.247	0.888	0.000
2.6667	0.123	0.254	0.897	0.000
2.7222	0.124	0.261	0.906	0.000
2.7778	0.125	0.268	0.931	0.000
2.8333	0.127	0.275	1.005	0.000
2.8889	0.128	0.282	1.106	0.000
2.9444	0.129	0.289	1.228	0.000
3.0000	0.130	0.296	1.368	0.000
3.0556	0.132	0.304	1.523	0.000
3.1111	0.133	0.311	1.691	0.000
3.1667	0.134	0.319	1.873	0.000
3.2222	0.136	0.326	2.067	0.000
3.2778	0.137	0.334	2.271	0.000
3.3333	0.138	0.341	2.486	0.000
3.3889	0.139	0.349	2.712	0.000
3.4444	0.141	0.357	2.946	0.000
3.5000	0.142	0.365	3.191	0.000
3.5556	0.143	0.373	3.443	0.000
3.6111	0.145	0.381	3.705	0.000
3.6667	0.146	0.389	3.974	0.000
3.7222	0.147	0.397	4.252	0.000
3.7778	0.149	0.405	4.537	0.000
3.8333	0.150	0.414	4.830	0.000
3.8889	0.151	0.422	5.131	0.000
3.9444	0.153	0.430	5.438	0.000
4.0000	0.154	0.439	5.752	0.000
4.0556	0.155	0.448	5.968	0.000
4.1111	0.157	0.456	6.355	0.000
4.1667	0.158	0.465	6.849	0.000
4.2222	0.160	0.474	7.419	0.000
4.2778	0.161	0.483	8.039	0.000
4.3333	0.162	0.492	8.680	0.000
4.3889	0.164	0.501	9.315	0.000
4.4444	0.165	0.510	9.915	0.000
4.5000	0.167	0.519	10.45	0.000
4.5556	0.168	0.529	10.92	0.000
4.6111	0.169	0.538	11.30	0.000
4.6667	0.171	0.548	11.59	0.000
4.7222	0.172	0.557	11.82	0.000
4.7778	0.174	0.567	12.10	0.000
4.8333	0.175	0.576	12.33	0.000
4.8889	0.177	0.586	12.55	0.000
4.9444	0.178	0.596	12.76	0.000

5.0000	0.180	0.606	12.96	0.000
5.0556	0.181	0.616	13.17	0.000

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 8.6377
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 2.5194
Total Impervious Area: 6.1183

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	2.429739
5 year	3.7419
10 year	4.450054
25 year	5.168118
50 year	5.593786
100 year	5.94324

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	1.576463
5 year	2.402139
10 year	3.035703
25 year	3.938572
50 year	4.687954
100 year	5.505321

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	1.827	1.474
1950	2.356	1.337
1951	3.193	1.311
1952	1.917	2.321
1953	2.612	1.015
1954	3.996	1.367
1955	2.007	0.898
1956	3.683	3.089
1957	3.256	1.540
1958	2.417	2.896

1959	1.461	0.827
1960	1.343	1.624
1961	3.360	2.179
1962	2.349	1.221
1963	2.629	1.273
1964	2.439	1.142
1965	2.092	1.766
1966	2.926	1.464
1967	2.644	1.282
1968	3.164	2.299
1969	3.028	4.036
1970	8.378	6.168
1971	1.337	0.875
1972	2.136	1.036
1973	2.222	2.023
1974	3.364	3.026
1975	1.913	0.925
1976	2.888	1.806
1977	0.086	0.817
1978	4.206	2.622
1979	2.744	2.511
1980	1.589	0.877
1981	3.767	2.378
1982	2.492	2.878
1983	4.557	2.279
1984	1.470	0.887
1985	1.060	1.961
1986	1.312	1.675
1987	2.317	1.531
1988	1.107	0.901
1989	1.197	0.958
1990	1.019	0.896
1991	2.691	1.139
1992	2.783	0.876
1993	3.303	2.844
1994	2.384	1.964
1995	1.969	2.435
1996	4.141	3.980
1997	5.048	2.989
1998	4.079	1.966
1999	2.845	1.965
2000	1.628	0.780
2001	0.898	0.792
2002	3.924	1.412
2003	2.988	2.147
2004	0.913	1.653
2005	1.215	1.037
2006	2.303	1.225
2007	1.255	2.304
2008	1.734	2.276

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	8.3780	6.1683
2	5.0477	4.0358
3	4.5566	3.9802
4	4.2064	3.0890

5	4.1414	3.0262
6	4.0789	2.9888
7	3.9961	2.8963
8	3.9244	2.8784
9	3.7674	2.8445
10	3.6832	2.6216
11	3.3641	2.5112
12	3.3596	2.4353
13	3.3033	2.3782
14	3.2564	2.3213
15	3.1931	2.3044
16	3.1637	2.2994
17	3.0283	2.2787
18	2.9882	2.2763
19	2.9261	2.1788
20	2.8883	2.1469
21	2.8448	2.0234
22	2.7828	1.9655
23	2.7438	1.9647
24	2.6905	1.9640
25	2.6442	1.9613
26	2.6290	1.8063
27	2.6119	1.7658
28	2.4920	1.6747
29	2.4394	1.6534
30	2.4168	1.6244
31	2.3842	1.5405
32	2.3558	1.5311
33	2.3492	1.4744
34	2.3171	1.4644
35	2.3027	1.4115
36	2.2222	1.3666
37	2.1362	1.3368
38	2.0918	1.3110
39	2.0071	1.2816
40	1.9686	1.2734
41	1.9173	1.2246
42	1.9131	1.2209
43	1.8266	1.1423
44	1.7338	1.1394
45	1.6276	1.0370
46	1.5889	1.0358
47	1.4705	1.0154
48	1.4615	0.9577
49	1.3425	0.9250
50	1.3373	0.9009
51	1.3125	0.8980
52	1.2546	0.8959
53	1.2149	0.8870
54	1.1966	0.8770
55	1.1067	0.8762
56	1.0595	0.8754
57	1.0189	0.8273
58	0.9127	0.8175
59	0.8982	0.7916
60	0.0862	0.7803

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.2149	896	715	79	Pass
1.2591	823	659	80	Pass
1.3033	755	600	79	Pass
1.3476	687	553	80	Pass
1.3918	626	509	81	Pass
1.4360	576	466	80	Pass
1.4803	535	435	81	Pass
1.5245	493	404	81	Pass
1.5687	457	368	80	Pass
1.6130	431	340	78	Pass
1.6572	392	309	78	Pass
1.7014	364	288	79	Pass
1.7456	346	274	79	Pass
1.7899	324	251	77	Pass
1.8341	305	228	74	Pass
1.8783	287	208	72	Pass
1.9226	271	186	68	Pass
1.9668	253	168	66	Pass
2.0110	237	152	64	Pass
2.0553	226	135	59	Pass
2.0995	211	124	58	Pass
2.1437	193	117	60	Pass
2.1880	182	106	58	Pass
2.2322	165	98	59	Pass
2.2764	152	88	57	Pass
2.3207	145	75	51	Pass
2.3649	131	67	51	Pass
2.4091	120	61	50	Pass
2.4534	107	59	55	Pass
2.4976	100	56	56	Pass
2.5418	96	54	56	Pass
2.5860	91	51	56	Pass
2.6303	83	48	57	Pass
2.6745	75	43	57	Pass
2.7187	71	40	56	Pass
2.7630	69	38	55	Pass
2.8072	62	36	58	Pass
2.8514	59	30	50	Pass
2.8957	56	26	46	Pass
2.9399	52	23	44	Pass
2.9841	49	23	46	Pass
3.0284	44	18	40	Pass
3.0726	43	17	39	Pass
3.1168	41	15	36	Pass
3.1611	39	15	38	Pass
3.2053	32	15	46	Pass
3.2495	30	14	46	Pass
3.2937	28	14	50	Pass
3.3380	26	13	50	Pass
3.3822	21	13	61	Pass
3.4264	19	13	68	Pass
3.4707	19	12	63	Pass
3.5149	19	11	57	Pass

3.5591	18	11	61	Pass
3.6034	16	10	62	Pass
3.6476	15	9	60	Pass
3.6918	14	8	57	Pass
3.7361	14	8	57	Pass
3.7803	12	7	58	Pass
3.8245	12	6	50	Pass
3.8688	12	6	50	Pass
3.9130	12	6	50	Pass
3.9572	11	6	54	Pass
4.0015	10	5	50	Pass
4.0457	10	4	40	Pass
4.0899	9	4	44	Pass
4.1341	9	4	44	Pass
4.1784	8	4	50	Pass
4.2226	7	4	57	Pass
4.2668	6	4	66	Pass
4.3111	6	4	66	Pass
4.3553	6	4	66	Pass
4.3995	6	4	66	Pass
4.4438	6	4	66	Pass
4.4880	6	2	33	Pass
4.5322	6	2	33	Pass
4.5765	5	2	40	Pass
4.6207	5	2	40	Pass
4.6649	5	2	40	Pass
4.7092	5	2	40	Pass
4.7534	5	2	40	Pass
4.7976	5	2	40	Pass
4.8419	5	2	40	Pass
4.8861	5	2	40	Pass
4.9303	5	2	40	Pass
4.9745	5	2	40	Pass
5.0188	5	2	40	Pass
5.0630	4	2	50	Pass
5.1072	4	2	50	Pass
5.1515	4	2	50	Pass
5.1957	4	2	50	Pass
5.2399	4	2	50	Pass
5.2842	4	2	50	Pass
5.3284	4	2	50	Pass
5.3726	4	2	50	Pass
5.4169	4	2	50	Pass
5.4611	4	2	50	Pass
5.5053	4	2	50	Pass
5.5496	4	2	50	Pass
5.5938	4	2	50	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0 acre-feet
On-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.
Off-line facility target flow:	0 cfs.
Adjusted for 15 min:	0 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	1260.38			☐	0.00			
Total Volume Infiltrated		1260.38	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Failed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

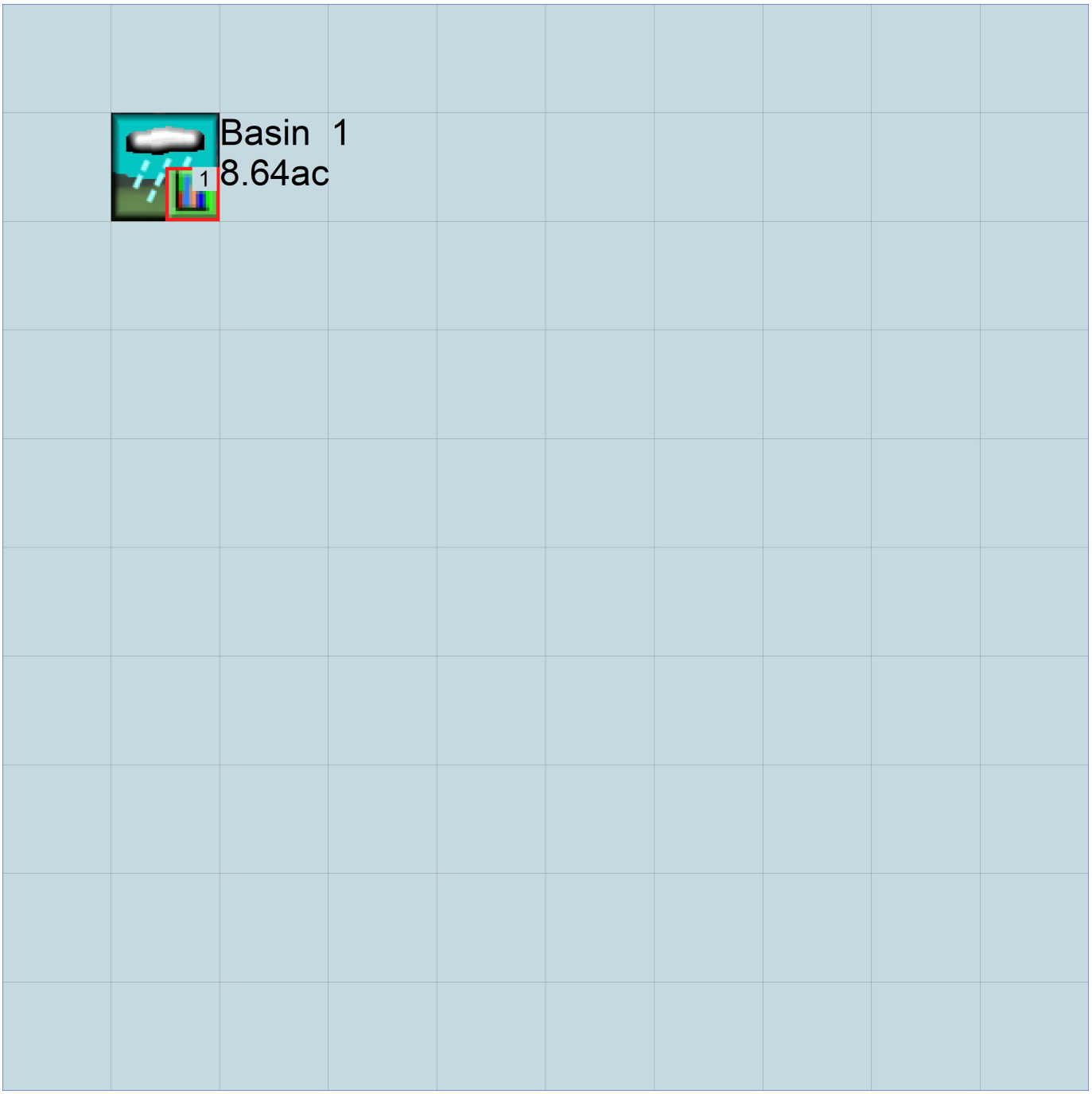
No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin 1.wdm
MESSU       25   PreBasin 1.MES
            27   PreBasin 1.L61
            28   PreBasin 1.L62
            30   POCBasin 11.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      29
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                     1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                         User  t-series Engl Metr ***
                                      in  out           ***
   29     SG4, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   29         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   29         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO
```

```
  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   29         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   29              0         6      0.04       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   29              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   29            0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   29              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1
```

```
END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  29                      8.6377     COPY   501     12
PERLND  29                      8.6377     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *      *  *  *  *  *        ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
```

```
WDM      1 EVAP     ENGL    0.8             PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8             IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Basin 1.wdm
MESSU       25   MitBasin 1.MES
            27   MitBasin 1.L61
            28   MitBasin 1.L62
            30   POCBasin 11.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      25
      IMPLND       1
      IMPLND       4
      IMPLND       5
      IMPLND       8
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title---------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   25     SG3, Lawn, Flat         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   25         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY
```

```
  PRINT-INFO
    <PLS > ***************** Print-flags ***************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   25         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   25         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   25              0         9      0.05       400      0.05         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   25              0         0       2.5         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                                  ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   25            0.1       0.8      0.25         4       0.4      0.25
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS       IFWS       LZS       AGWS      GWVS
   25              0         0         0          0         3          1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
    5      DRIVEWAYS/FLAT         1    1    1   27    0
    8      SIDEWALKS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
    5         0    0    1    0    0    0
    8         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    4    1    9
    4         0    0    4    0    0    0    1    9
    5         0    0    4    0    0    0    1    9
    8         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
```

```
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
    5         0    0    0    0    0
    8         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
    5            400      0.01       0.1       0.1
    8            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
    5              0         0
    8              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
    5              0         0
    8              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  25                      2.5194     RCHRES   1      2
PERLND  25                      2.5194     RCHRES   1      3
IMPLND   1                       1.342     RCHRES   1      5
IMPLND   4                      4.0645     RCHRES   1      5
IMPLND   5                      0.3809     RCHRES   1      5
IMPLND   8                      0.3309     RCHRES   1      5

******Routing******
PERLND  25                      2.5194     COPY     1     12
IMPLND   1                       1.342     COPY     1     15
IMPLND   4                      4.0645     COPY     1     15
IMPLND   5                      0.3809     COPY     1     15
IMPLND   8                      0.3309     COPY     1     15
PERLND  25                      2.5194     COPY     1     13
RCHRES   1                           1     COPY   501     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
```

```
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                        in  out                             ***
    1     Trapezoidal Pond-005    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                    ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0        2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------><--------> ***
    1               1      0.02       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                       ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.069559  0.000000  0.000000
  0.055556  0.070559  0.003892  0.129523
  0.111111  0.071564  0.007840  0.183173
  0.166667  0.072573  0.011844  0.224341
  0.222222  0.073588  0.015904  0.259046
  0.277778  0.074608  0.020020  0.289623
  0.333333  0.075634  0.024194  0.317266
  0.388889  0.076664  0.028424  0.342686
  0.444444  0.077699  0.032712  0.366347
  0.500000  0.078740  0.037058  0.388570
  0.555556  0.079785  0.041461  0.409588
  0.611111  0.080836  0.045923  0.429580
  0.666667  0.081892  0.050443  0.448681
  0.722222  0.082953  0.055022  0.467002
  0.777778  0.084018  0.059660  0.484631
  0.833333  0.085090  0.064358  0.501641
  0.888889  0.086166  0.069115  0.518093
  0.944444  0.087247  0.073932  0.534038
  1.000000  0.088333  0.078809  0.549520
  1.055556  0.089425  0.083747  0.564578
  1.111111  0.090521  0.088745  0.579245
  1.166667  0.091623  0.093805  0.593550
```

```
1.222222  0.092730  0.098926  0.607518
1.277778  0.093842  0.104108  0.621171
1.333333  0.094959  0.109353  0.634531
1.388889  0.096081  0.114659  0.647616
1.444444  0.097208  0.120028  0.660441
1.500000  0.098340  0.125460  0.673022
1.555556  0.099478  0.130955  0.685372
1.611111  0.100620  0.136514  0.697504
1.666667  0.101768  0.142135  0.709428
1.722222  0.102920  0.147821  0.721155
1.777778  0.104078  0.153571  0.732694
1.833333  0.105241  0.159386  0.744054
1.888889  0.106409  0.165265  0.755243
1.944444  0.107582  0.171209  0.766269
2.000000  0.108760  0.177218  0.777139
2.055556  0.109944  0.183294  0.787859
2.111111  0.111132  0.189435  0.798435
2.166667  0.112326  0.195642  0.808872
2.222222  0.113524  0.201915  0.819177
2.277778  0.114728  0.208256  0.829353
2.333333  0.115937  0.214663  0.839406
2.388889  0.117151  0.221138  0.849340
2.444444  0.118370  0.227680  0.859160
2.500000  0.119594  0.234290  0.868868
2.555556  0.120823  0.240968  0.878469
2.611111  0.122057  0.247715  0.887966
2.666667  0.123297  0.254530  0.897363
2.722222  0.124541  0.261415  0.906662
2.777778  0.125791  0.268368  0.931284
2.833333  0.127045  0.275392  1.005088
2.888889  0.128305  0.282485  1.106369
2.944444  0.129570  0.289648  1.228464
3.000000  0.130840  0.296881  1.368047
3.055556  0.132115  0.304186  1.523014
3.111111  0.133396  0.311561  1.691875
3.166667  0.134681  0.319008  1.873506
3.222222  0.135971  0.326526  2.067016
3.277778  0.137267  0.334116  2.271681
3.333333  0.138567  0.341778  2.486891
3.388889  0.139873  0.349512  2.712130
3.444444  0.141184  0.357319  2.946950
3.500000  0.142500  0.365199  3.190957
3.555556  0.143821  0.373153  3.443803
3.611111  0.145147  0.381180  3.705177
3.666667  0.146478  0.389280  3.974798
3.722222  0.147815  0.397455  4.252411
3.777778  0.149156  0.405704  4.537785
3.833333  0.150503  0.414028  4.830705
3.888889  0.151854  0.422427  5.130977
3.944444  0.153211  0.430901  5.438417
4.000000  0.154573  0.439451  5.752857
4.055556  0.155940  0.448076  5.968734
4.111111  0.157312  0.456778  6.355822
4.166667  0.158689  0.465555  6.849790
4.222222  0.160071  0.474410  7.419918
4.277778  0.161459  0.483341  8.039214
4.333333  0.162851  0.492350  8.680254
4.388889  0.164249  0.501436  9.314964
4.444444  0.165651  0.510600  9.915940
4.500000  0.167059  0.519842  10.45862
4.555556  0.168472  0.529162  10.92405
4.611111  0.169890  0.538561  11.30217
4.666667  0.171313  0.548039  11.59541
4.722222  0.172741  0.557596  11.82272
4.777778  0.174175  0.567233  12.10482
4.833333  0.175613  0.576949  12.33114
4.888889  0.177056  0.586745  12.55023
4.944444  0.178505  0.596622  12.76274
5.000000  0.179959  0.606579  12.96925
END FTABLE  1
```

```
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3           PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3           IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8           IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

Legal Notice

This program and accompanying documentation are provided 'as-is' without warranty of any kind. The entire risk regarding the performance and results of this program is assumed by End User. Clear Creek Solutions Inc. and the governmental licensee or sublicensees disclaim all warranties, either expressed or implied, including but not limited to implied warranties of program and accompanying documentation. In no event shall Clear Creek Solutions Inc. be liable for any damages whatsoever (including without limitation to damages for loss of business profits, loss of business information, business interruption, and the like) arising out of the use of, or inability to use this program even if Clear Creek Solutions Inc. or their authorized representatives have been advised of the possibility of such damages. Software Copyright © by : Clear Creek Solutions, Inc. 2005-2025; All Rights Reserved.

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

APPENDIX C

Geotechnical Report

TRUE NORTH
GEOTECHNICAL

Pacific Lifestyle Homes
Geotechnical Engineering Evaluation

Reserve at Green Mountain (Formerly Bahu Property)
2625 NE Goodwin Road
Camas, Washington

True North Project No. 24-0368-2

April 2025 (revised May 2025)

April 18, 2025 (revised May 22, 2025)

Pacific Lifestyle Homes (PLH)
11815 NE 99th Street, Suite 1200
Vancouver, WA 98682
Attn: Nick Edwards
Email: nicke@buildplh.com

Subject: Geotechnical Engineering Evaluation
Reserve at Green Mountain Subdivision (Formerly Bahu Property)
2625 NE Goodwin Road
Camas, Clark County, Washington
Clark County Parcel No. 173192000
True North Project # 24-0368-2

True North Geotechnical Services (True North) is pleased to submit our finalized Geotechnical Engineering Evaluation for the project noted above. This report was prepared in accordance with "True North Geotechnical - General Services Agreement (GSA) P24-0368-2" dated March 18, 2025, which was authorized by Samantha Zimmer with PLH on March 20, 2025. This report is intended to build off our conclusions summarized in our previously issued report, "Preliminary Geotechnical Engineering Evaluation – Goodwin Road (Bahu)", dated December 3, 2024. This report summarizes the entirety of our work accomplished and provides our geotechnical recommendations for development of the property with the proposed Reserve at Green Mountain development.

PROJECT UNDERSTANDING

Our current understanding of the project is based on the information provided to True North by Pacific Lifestyle Homes (PLH) and their project civil engineer, PLS Engineering. We have been provided the following document related to the proposed project:

- **A one-page drawing, titled "Reserve at Green Mountain PRD", undated, prepared by PLS Engineering**. This pre-application drawing shows the proposed layout of the development, including 49 single-family lots, a network of 2-lane local streets, and the proposed stormwater facility. The proposed development is overlain on the site's existing conditions and includes a wetland buffer for the mapped potential wetland in the southern quarter of the site.

Briefly, we understand that the subdivision will be developed with 49 single-family residential lots with concrete driveways. The remainder of the property will be developed with asphalt paved roads, associated utilities, landscape/hardscape, and stormwater infiltration facilities. The south of the site includes proposed recreational open space, including passive areas (wetland and buffer), and active open space for public recreation.

We understand this project is in the preliminary planning stages. As such, we have not been provided any structural drawings or foundation loads other than an indication that the single-family residences will be 1- or 2-story buildings. Preliminarily, we have assumed that maximum building loads will on the order of be 4 kips per linear foot for continuous wall footings, 25 kips per isolated column footing, and 150 psf for floor slabs on grade. As the site is generally flat, or gently sloped, we anticipate cuts and fills no greater than 2 to 4 feet, with the exception of utility trenches, and assuming the proposed new residences are not planned to have basements. Finally, we have assumed that the proposed development will be constructed in accordance with the provisions of the 2021 International Building Code (IBC) as well as any jurisdictional code requirements.

SCOPE OF SERVICES

The purpose of our services was to explore the site surface and subsurface conditions in order to provide geotechnical recommendations for the proposed development. The following describes our specific scope of services:

- **Geologic Map Review**: We reviewed relevant available geologic maps of the site for information regarding geologic conditions and hazards at or near the site.
- **Subsurface Explorations**: We excavated a total of 9 test pits (TP-1 through TP-9) to depths ranging between 4.5 and 11 feet below existing ground surface (bgs) across the proposed development area, at the locations shown on Figure 2. Soil samples were collected from the major strata encountered in each test pit.
- **Infiltration Testing:** Infiltration testing was attempted, but due to shallow groundwater and unsuitable soils, could not be performed.
- **Laboratory Testing:** All samples were returned to our office and select samples were subjected to additional laboratory testing, that included: in-situ moisture content and fines content testing.
- **Engineering Analyses:** All data collected during the subsurface exploration, literature research, and laboratory testing was evaluated and used to develop geotechnical design and construction recommendations.
- **Geotechnical Engineering Evaluation:** This document summarizes our geotechnical engineering evaluation services, and includes:
  - A site vicinity map and site plan showing the approximate locations of our explorations.
  - A discussion of subsurface conditions encountered including pertinent soil and rock properties as well as the encountered groundwater conditions.
  - Geotechnical related recommendations for foundation design including allowable bearing capacity and estimated settlements.
  - Seismic design parameters in accordance with ASCE 7-16.
  - The results of our infiltration testing.
  - Structural fill recommendations, including an evaluation of whether the in-situ soils can be used as structural fill.
  - Floor slab support recommendations.

- General retaining wall design parameter recommendations, including earth pressures, backfill, and drainage.
- Flexible and rigid pavement design recommendations.
- General comments regarding site grading and drainage.
- Discussions on other geotechnical issues that may impact the project.

SITE CONDITIONS

Surface Description

The proposed development is an 11.67-acre lot, located at 2625 NE Goodwin Road, Camas, Clark County, Washington; Clark County Parcel # 173192000. The site is bound to the north by NE Goodwin Road and to the east and west by similarly rural single-family residences. The parcel to the south is maintained as an open park space by Clark County Parks.

The current development at the site consists of one single-family residence and attached garage, two outbuildings, a concrete well house, a paved driveway, and all utilities associated with the residence (including a septic tank to the east of the existing residence and a power vault to the north of the residence). It is our understanding that the single-family residence will remain while the existing outbuildings, well house, and driveway on site will be demolished as part of development activities.

There is significant variation in vegetation over the ground surface of the lot. The northern third of the site, abutting NE Goodwin Road, generally consists of an open pasture. Vegetation in this area consists of thick, hummocky, knee-high grasses, tall weeds, and blackberry bushes along the existing fence lines. The existing outbuildings and well house are located in the central third of the site, which is largely characterized by mature evergreen trees, significant stands of blackberry bushes (especially around the southern outbuilding, well house, and along the east and west property lines), and maintained lawn along the existing driveway. The existing residence is located in the southern third of the site, which is largely made up of a field of maintained, low grass transitioning to wetland vegetation in the southwest and southern extents of the site.

In terms of topography, the northeastern corner of the property is located at 234 feet AMSL (above median sea level), and the site descends at a gentle 0 to 10 percent gradient to the southwestern corner of the property, which is located at 196 feet AMSL. Within the proposed development area, the ground surface is locally flatter and approximately terraced, with an approximate 0 to 5 percent gradient descending to the south. The existing residence sits at the southern extent of this terrace, and south of the existing residence, the local slopes are slightly steeper as they descend into the wetland and proposed open space, with a 5 to 10 percent gradient.

Geologic Setting

The map area lies on the eastern margin of the Portland Basin, which is part of the Puget-Willamette Lowland that separates the Cascade Range from the Oregon Coast Range. Since late Eocene time,

the Cascade Range has been the locus of an episodically active volcanic arc associated with underthrusting of oceanic lithosphere beneath the North American continent along the Cascadia Subduction Zone.

The underlying geologic unit at the subject property is mapped by the Washington Geologic Information Portal as “QTc – Quaternary-Tertiary continental sedimentary rocks and deposits – conglomerate with sandy and silty facies. Quaternary-Miocene pebble, cobble, and boulder gravel. Pleistocene-Pliocene gravel, sand, silt, and clay; deposits of the ancestral Columbia River.”

According to the USDA Soil Survey, there are a number of surficial soils mapped at the site.

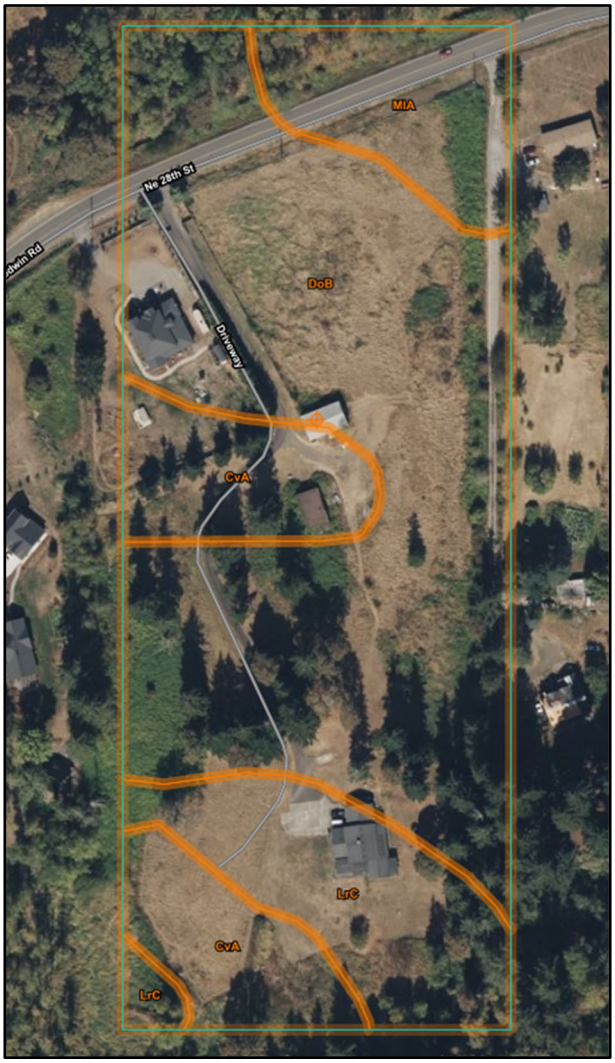


Exhibit 1: USDA mapped surficial soils at the site

In the northeastern corner of the site, surface soils are mapped as the “MIA: McBee silt loam, coarse variant, 0 to 3 percent slopes”. The McBee series consists of somewhat poorly drained soils that permeate at a moderately high to high rate. These soils formed in alluvium and are found in

depressions and drainageways. In the area of the existing outbuildings in the center of the site and in the southwestern corner of property, surface soils are mapped as “CvA: Cove silty clay loam, 0 to 3 percent slopes”. The Cove series is poorly drained, with moderately low to moderately high permeability, and are generally encountered within flood plains. Both the McBee and Cove series are characterized as hydric soils, which have shallow depths to the water table and experience regular or extended flooding or ponding.

Additional soil types mapped at the site include “DoB: Dollar loam, 0 to 5 percent slopes”, and “LrC: Lauren gravelly loam, cemented substratum, 3 to 15 percent slopes”. Both the Dollar and Lauren series are moderately well drained, with very low to high permeability.

Subsurface Conditions

On November 4, 2024, we visited the site to excavate five exploratory test pits (TP-1 through TP-5), as part of our preliminary evaluation of the site. On March 21, 2025 we returned to excavate four additional test pits (TP-6 through TP-9). In all, we excavated a total of 9 test pits to depths ranging between 4.5 and 11 feet below existing ground surface (bgs) across the proposed development area. Soil samples were collected from the major strata encountered in each test pit and were returned to our office for examination and index testing. See Figure 2 - Site & Exploration Plan for the locations of our explorations.

As indicated above, the subsurface conditions at the site are highly variable and the conditions encountered in our explorations appear consistent with the soil types indicated in regional soil maps. Descriptions of field and lab procedures and the exploration logs are included in Appendix A. The following is a highly generalized description of the subsurface units encountered:

FILL:

At the ground surface of TP-2, we encountered 2 feet of soft, silt with clay, undocumented fill, overlying 6 inches of crushed gravel. As this material will be removed as part of development activities, we did not perform any laboratory testing on this layer.

SILT:

At the ground surface in all the explorations except TP-2, we encountered dark brown to red-brown soft to medium stiff SILT with Clay and Clayey SILT. At TP-2, we first encountered this layer beneath the undocumented fill, at 2.5 feet bgs. In TP-1 and TP-2, in the northeast portion of the site, these soft to medium stiff, fine-grained soils extended to depths of 6 to 9 feet. Over the remainder of our explorations these surficial fine-grained soils extended to 1.5 to 5 feet bgs.

Laboratory tests conducted on soil samples collected from this layer returned moisture contents ranging from 21 to 32 percent, and fines contents ranging from 54 to 77 percent.

SAND:

Underlying the silt material found at TP-1, TP-4, TP-6 and TP-8, we encountered medium dense to very dense SAND with varying amounts of fines (clay and gravel). This layer extended to depths ranging between 2 and 9 feet bgs.

Laboratory testing conducted on this layer returned moisture contents ranging between 19 and 41 percent and fines contents ranging between 39 and 49 percent..

GRAVEL (WEATHERED BEDROCK):

Underlying the silt or sand material found in all test pits except TP-3 and TP-4, we encountered dense to very dense GRAVEL with varying amounts of clay, extending to the termination depth of those explorations where it was encountered explorations. This material was interpreted to be weathered bedrock at depths.

Laboratory tests conducted on soil samples collected from these layers returned moisture contents ranging from 19 to 55 percent, and a fines content of 25 percent.

As previously mentioned, the subsurface conditions at the site exhibited significant variation, consistent with the multiple mapped USDA soil types within the property. The above generalized descriptions are a rough overview of the encountered conditions. More detailed information of subsurface conditions can be found in the attached Test Pit Logs in Appendix A.

Groundwater

Groundwater was encountered at TP-1, TP-2, TP-3, TP-6, TP-8, and TP-9, at depths of 5, 8.5, 6, 3.5, 1.5, and 3 feet bgs, respectively. TP-1 and TP-6 were excavated near mapped hydric soils in the southeast corner of the site, while TP-2, TP-4, TP-8 and TP-9 were excavated in non-hydric soils. Data published on Clark County MapsOnline indicates that groundwater at the site is between 0 to 10 feet bgs, which agrees with groundwater conditions observed in our explorations.

Depending on the time of year of construction, it may be possible that groundwater could be an issue during shallow foundation construction. Additionally, utility trenches may encounter perched water and infiltration facilities will need to be located at a shallow enough depth that adequate vertical spacing is provided between the bottom of the facility and seasonal high groundwater. Groundwater elevations can fluctuate depending on the time of year of construction and changes in land use.

Infiltration Testing/Feasibility

Based on the presence of shallow groundwater at most of our explorations and the lack of suitable soils above the groundwater table for infiltration, infiltration testing could not be reliably completed at the property. It is our opinion that subsurface infiltration is not a feasible method of stormwater management at this site.

Geologic Hazards Review

The following provides a geologic hazards review for the subject site in accordance with CCC 40.430. The geologic hazard review is based on our site reconnaissance and explorations, as well as a review of publicly available published literature and maps.

Mapped Hazards: As a part of our due diligence, we reviewed the Clark County Property Information Center - MapsOnline website (https://gis.clark.wa.gov/gis/property) for information on geologic hazards present at this property. No geologic hazards are mapped on this property. The site is mapped as having an NEHRP site class C and very low liquefaction susceptibility. We address the applicable sections of CCC 40.430 below:

Liquefaction: As stated above, the area to be developed is mapped as having a very low liquefaction susceptibility. This corresponds to the conditions observed in our explorations where dense soils with a significant coarse material percentage (eg, sand, gravel, cobbles, or boulders) were encountered at relatively shallow depths ranging between 1.5 and 9 feet bgs. Dense, large-grained soils below the water table (encountered at 5 feet bgs at the shallowest) have a very low potential for liquefaction.

Ground Motion Amplification: In accordance with ASCE 7-16, we recommend a Site Class C (dense soil and soft rock soil profile with an average N-value greater than 50) for this site when considering the average of the upper 100 feet of bearing material beneath the foundations. This recommendation is based on the results of our subsurface investigation as well as our understanding of the local geology. Inputting our recommended Site Class as well as the site latitude and longitude into the ACSE 7 website (ASCE 7 Hazard Tool), we obtained the seismic design parameters shown in Table 1 below. Note that the values for F_a and F_v in Table 2 were obtained from ASCE's Supplement 3 dated November 5, 2021 and issued for ASCE 7-16 to correct some seismic design issues in the original publication.

Table 1. 2021 IBC (ASCE 7-16, Supplement 3) Seismic Design Parameters

Location	Short Period	1-Second
Maximum Credible Earthquake Spectral Acceleration	S_s = 0.797 g	S_1 = 0.351 g
Site Class	C	
Site Coefficient	F_a = 1.2	F_v= 1.5
Adjusted Spectral Acceleration	S_{MS} = 0.957 g	S_{M1} = 0.527 g*
Design Spectral Response Acceleration Parameters	S_{DS} = 0.638 g	S_{D1} = 0.351 g
MCE_G Peak Ground Acceleration	MCE_G PGA = 0.357 g	
Site Amplification Factor at PGA	F_{PGA} = 1.2	
Site Modified Peak Ground Acceleration	PGA_M = 0.429 g	

g – acceleration due to gravity, * See note below.

The return interval for the ground motions reported in the table above is 2 percent probability of exceedance in 50 years.

CONCLUSIONS AND RECOMMENDATIONS

Geotechnical Design and Construction Considerations

Based on the results of our Geotechnical Engineering Evaluation, development of the site with the proposed development is feasible provided the recommendations in this report are included in the project design and implemented during construction.

The primary geotechnical concerns associated with the project are:

1. **Presence of soft surficial soils.** As noted above, we encountered variable depths of fill and/or soft surficial soils across the site, ranging in thickness between 0.5 and 2.5 feet below existing ground surface (bgs). The fill encountered in TP-2 extended to about 2.5 feet bgs and consisted of 2 feet of soft silt with clay underlain by 6 inches of ¾" minus gravel. During mass grading we expect much of the surficial soils will be removed from the site or stockpiled for use in landscape areas. Once the subgrade has been approved by True North, mass grading may begin using suitable onsite material or imported structural/engineered fill. We expect that foundations will generally bear on properly placed and compacted structural/engineered fill.

2. **Presence of shallow groundwater and seepage.** As stated above, we encountered shallow groundwater in several of our explorations across the site, in both mapped hydric soils areas, and outside of these areas. We do not anticipate that generally groundwater will become an issue for mass grading and shallow foundation construction. However, given that groundwater was encountered at 1.5 feet bgs at TP-8, it is more likely that groundwater may present an issue during mass grading and shallow foundation construction in the north of the site, and particularly during the wet winter months.

   Additionally, utility trenches and other embedded structure excavations will likely encounter groundwater during development of the site. The contractor will need to be prepared for this condition.

   Finally, due to the presence of shallow groundwater across the site, it is our opinion that the subsurface conditions are not conducive to the use of infiltration for stormwater management for the proposed project.

In summary, provided the recommendations in this report are adhered to, we do not foresee any major issues that would preclude the proposed development. The above-mentioned factors are listed to draw the attention of the reader to the issues to address during design and construction.

Moisture Sensitive Soils/Weather Related Concerns

The fine-grained soils at this site are considered moisture sensitive. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

Given the depth of the soft surficial soils encountered across this site, the contractor may need to consider the construction of temporary haul roads depending on the time of year construction takes place. True North can provide more detailed wet weather recommendations if needed. Stormwater should not be allowed to collect on prepared subgrades.

Site Preparation

Site preparation will include clearing, grubbing, etc. to remove the upper organic and fill soils to expose the underlying, native, medium dense silty sand and/or very dense, silty gravel and cobbles. Once the stripping has been approved we recommend proofrolling the site with a fully loaded, tandem axle dump truck to identify any excessively soft spots under the observation of the Geotechnical Engineer during various phases of construction to ensure proper fill placement. Areas not able to be adequately proofrolled (or where not practical) will be evaluated by the Geotechnical Engineer using a ½-inch diameter steel probe rod. Any soft spots identified should be over excavated to expose firm and unyielding soils and replaced with compacted structural fill.

Any utilities present beneath the proposed construction will need to be located and rerouted as necessary and any abandoned pipes or utility conduits should be removed to inhibit the potential for subsurface erosion. Utility trench excavations should be backfilled with properly compacted structural fill in accordance with the structural fill recommendations in this report.

It should be noted that, due to the soft surficial soils observed over much of the site, construction traffic on these upper soils may have a difficult time moving around on site. We recommend consideration be given to constructing haul roads depending on site conditions at the time of construction.

Subgrade Verification

Following site preparation, including removal of all topsoil/till zone and compaction of the exposed subgrade and prior to placing aggregate base for the foundations, building pad, or pavement section, the exposed subgrade should be evaluated. The subgrades should be evaluated by qualified True North personnel using a steel foundation probe. Unsuitable areas identified during the field evaluation should be re-compacted to or be excavated to firm ground and replaced with structural fill.

Excavations

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document and subsequent updates were issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

Depending on the time of year, and the depth of the excavation, groundwater may be encountered at shallow depths. If groundwater is encountered during excavation, the soils encountered in our subsurface explorations should be classified as Type C soil according to the most recent OSHA regulations. If groundwater is not encountered or dewatering is accomplished in advance of excavation, the soils may be classified as Type B soil. In our opinion, excavations should be safely sloped or shored.

If groundwater is encountered during excavation, positive groundwater control will be required, including the possibility of wells extending below the depth of excavation. Groundwater levels will be lowest in the dry season, and construction during that time will minimize groundwater control problems. The groundwater conditions at the time of construction and the contractor’s ability to control these conditions will control the degree of inclination of temporary slopes. In our opinion, temporary excavation slopes can be constructed as steep as 1.5H:1V, if groundwater levels are maintained at least 2 feet below the bottom of the excavation. Slopes should be flattened if significant seepage or running soils are encountered.

If slopes of this inclination, or flatter, cannot be constructed, or if excavations greater than four feet in depth are required, temporary shoring may be necessary. This shoring would help protect against slope or excavation collapse and would provide protection to workmen in the excavation.

We are providing this information solely as a service to our client. True North does not assume responsibility for construction site safety or the contractor's compliance with local, state, and federal safety or other regulations.

Construction Dewatering

The results of our subsurface investigations indicate that the groundwater seepage at the site is located some 3 to 5 feet below the ground surface, and will fluctuate in response to seasonal precipitation. Excavations that extend below the groundwater level may result in caving, heaving, or running soils, especially if excavations extend into the sandy clay soils encountered in our explorations. The contractor should consider the use of a network of ditches and sumps, into which water can flow to be pumped out of the excavation.

The depth and dewatering time will need to be determined at the time of construction and adjusted depending on site conditions. Unprotected working should not be allowed near temporary un-shored excavations until groundwater levels have been stabilized and shoring, such as trench shields or bracing, has been installed.

Structural Fill

Structural fill should be granular, free of organics or other deleterious materials, have a maximum particle size less than 3 inches, be relatively well graded, and have a liquid limit less than 45 and plasticity index less than 25. In our professional opinion, we anticipate the surficial fine-grained soils stripped from this site may be used only in landscape areas. These soils are moisture sensitive and could be difficult (depending on time of year of construction) to properly moisture condition and place. As such, the contractor will need to account for the need to import material to raise site grades. We recommend crushed rock structural fill be placed beneath footings, slabs, or other structural elements to allow for uniform load distribution, to provide protection from the elements, and to create a clean working surface.

We recommend all structural fill be moisture conditioned to within 3 percentage points below and 2 percentage points above optimum moisture as determined by ASTM D1557 (modified proctor). If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying.

Fill should be placed in relatively uniform horizontal lifts on the prepared subgrade which has been stripped of deleterious materials (i.e. topsoil and fill) and approved by the Geotechnical Engineer or his representative. Each loose lift should be about 1-foot thick. The type of compaction equipment used will ultimately determine the maximum lift thickness. Structural fill should be compacted to at least 95 percent of modified proctor maximum dry density as determined by ASTM D1557. Each lift of compacted engineered fill should be tested by a representative of the Geotechnical Engineer prior to placement of subsequent lifts.

Utility Trench Backfill

Trench backfill for the utility pipe base and pipe zone should consist of well-graded granular material with a maximum particle size of ¾ inch and less than 8 percent by weight passing the U.S. Standard No. 200 Sieve. The material should be free of roots, organic matter, and other unsuitable materials.

Trench backfill should be compacted to at least 90 percent of the maximum dry density at depths greater than 4 feet below finished grade and to 95 percent of the maximum dry density within 4 feet of finished grade. Compaction is based on ASTM D1557/AASHTO T-180, the modified proctor test, or as recommended by the pipe manufacturer.

Foundation Recommendations

Once the site has been properly prepared as discussed above, the planned construction can be supported on a conventional shallow foundation system. All foundations should bear on native, undisturbed, medium stiff clayey silt, or, heavily recompacted, native, sandy clay, or, atop compacted granular crushed rock structural fill placed atop the approved subgrade soils. Spread footings for building columns and continuous footings for bearing walls supported on the above-mentioned materials can be designed for an allowable soil bearing pressure of 2,000 psf based on dead load plus design live load and can be increased by one-third when including short-term wind or seismic loads. The above allowable soil bearing pressures can be increased by one-third when including short-term wind or seismic loads. Construction shall be accomplished in accordance with the 2021 International Building Code (IBC).

Lateral frictional resistance between the base of footings and the subgrade can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.33 for concrete foundations bearing directly on the subgrade soils described above or on compacted structural fill placed atop that strata In addition, lateral loads may be resisted by passive earth pressures based on an equivalent fluid pressure of 250 pounds per cubic foot (pcf) for footings poured “neat” against the above-mentioned soil/rock strata. These are ultimate values—we recommend a factor of safety of 1.5 be applied to the equivalent fluid pressure, which is appropriate due to the amount of movement required to develop full passive resistance.

Exterior footings and foundations in unheated areas should be located at a depth of at least 18 inches below the final exterior grade to provide adequate frost protection. If the construction takes place during the winter months and the foundation soils will likely be subjected to freezing temperatures after foundation construction, then the foundation soils should be adequately protected from freezing. Otherwise, interior foundations can be located at nominal depths compatible with architectural and structural considerations.

The foundation excavations should be observed by a representative of the Geotechnical Engineer prior to steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Unsuitable soil zones encountered at the bottom of the foundation excavations should be removed and replaced with properly compacted structural fill as directed by the Geotechnical Engineer.

The fine-grained soils at this site are moisture sensitive. As such, they should be kept to as close to their in-situ moisture content. This should be accomplished during construction by covering the

soil subgrade the same day it is exposed with crushed rock structural fill. Surface run-off water should be drained away from the excavations and not be allowed to pond.

Based on the known subsurface conditions we anticipate that properly designed and constructed foundations supported on the above-mentioned materials could experience maximum total settlement on the order of 1-inch and differential settlement on the order of 1/2-inch over 30 horizontal feet.

Granular Pads: Granular pads should be used if unsuitable foundation conditions are encountered at the proposed foundation subgrade elevations. Granular pads should extend 6 inches horizontally beyond the margins of the footings for each foot of the pad thickness or to the depth of firm, undisturbed native soil. The granular pads should be a minimum of 6 inches thick, however if embedded structures are encountered in the foundation areas, the embedded structure should be removed down to a minimum 24-inches below the base of footing, and granular pads should be thickened accordingly.

The granular pads should consist of ¾-inch minus crushed rock that is fairly well graded between coarse and fine, contains no organic matter or other deleterious materials, and has less than 5 percent passing the U.S. Standard No. 200 Sieve. The imported crushed rock should be compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D 698.

Retaining Walls

We were not provided any construction drawings that would indicate if site retaining walls are necessary to complete the grading of the site. True North is available to provide a separate retaining wall design for any planned walls. We provide the following recommendations for use by the Structural Engineer in the event additional stem walls or other concrete structural walls are required for the homes.

The foundations for the proposed walls should be designed in accordance with foundation recommendations above. Lateral earth pressures on walls, which are not restrained at the top, may be calculated on the basis of an “active” equivalent fluid pressure of 35 pcf for level backfill, and 60 pcf for sloping backfill with a maximum 2H:1V slope. Lateral earth pressures on walls that are restrained from yielding at the top (i.e. stem walls) may be calculated on the basis of an “at-rest” equivalent fluid pressure of 55 pcf for level backfill, and 90 pcf for sloping backfill with a maximum 2H:1V slope. The stated equivalent fluid pressures do not include surcharges, such as foundation, vehicle, equipment, etc., behind walls, hydrostatic pressure buildup, or earthquake loading.
For seismic loading on retaining walls with level backfill, new research indicates that the seismic load is to be applied at 1/3 H of the wall instead of 2/3 H, where H is the height of the wall. We recommend that a Mononobe-Okabe earthquake thrust per linear foot of 4.8 psf* H^2 be applied at 1/3 H, where H is the height of the wall measured in feet. For a maximum 2H:1V slope we recommend 8.5 psf*H^2. This assumes a combination of soil and granular backfill retained by the walls within the active wedge.

All backfill for retaining walls should be select granular material, such as sand or crushed rock with a maximum particle size between ¾ and 1 ½ inches, having less than 5 percent material passing the No. 200 sieve. Because of their silt content, the native soils do not meet this requirement, and it will be necessary to import material to the project for wall backfill. Silty soils can be used for the last 18 to 24 inches of backfill, thus acting as a seal to the granular backfill. All backfill behind retaining walls should be moisture conditioned to within ± 2 percent of optimum moisture content and compacted to a minimum of 90 percent of the material's maximum dry density as determined in accordance with ASTM D1557. Fill materials should be placed in layers that, when compacted, do not exceed about 8 inches. Care in the placement and compaction of fill behind retaining walls must be taken in order to ensure that undue lateral loads are not placed on the walls. An adequate subsurface drain system will need to be designed and installed behind retaining walls to prevent hydrostatic buildup.

Slab-on-grade Floors

Support for lightly loaded floor slabs can be obtained on the undisturbed native soil or on engineered structural fill. A minimum 4-inch-thick layer of imported granular material should be placed and compacted over the prepared subgrade to assist as a capillary break and provide uniform load distribution.

A subgrade modulus of 150 pounds per cubic inch may be used to design floor slabs. Imported granular material should be crushed rock or crushed gravel and sand that is well-graded between coarse and fine, contain no deleterious materials, have a maximum particle size of 1½ inches, and have less than 5% by weight passing the U.S. Standard No. 200 Sieve. The imported granular material may be placed in one lift and should be compacted until well-keyed, about 95% of the maximum dry density as determined by ASTM D1557 (AASHTO T-180).

Pavement

The following pavement design recommendations are based on our experience with similar facilities and subgrade conditions.

For automobile parking areas, we recommend a pavement section consisting of 3 inches of asphaltic concrete (AC) over 8 inches of crushed rock base (CRB) or 5 inches of Portland Cement concrete (PCC) over 5 inches of crushed rock base (CRB). For truck traffic areas, the pavement section should consist of 4 inches of AC over 12 inches of CRB or 6 inches of PCC over 8 inches of CRB. These recommended pavement sections are based on the assumption that the subgrade consists of firm structural fill or compacted native subgrade and that the pavement will be constructed during the dry summer months. Proofrolling should be used to evaluate pavement subgrade. Any soft areas disclosed by proofrolling will likely need to be reworked. Some contingency should be provided for the repair of any soft areas. If pavement construction is scheduled for the wet season, it will be necessary to increase the above-recommended base course sections.

AC and CRB materials should conform to WSDOT specifications. All CRB should be compacted to at least 95 percent of the modified proctor ASTM D-1557 laboratory test standard.

Drainage: Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as around stormwater catch basins. Effective means to prevent saturation of the base course including installing weep holes in the sidewalls to catch basins.

Geotextile Separation Fabric: A geotextile separation fabric will be required at the interface of the native soil and imported subgrade material beneath the proposed roadways. The separation fabric should meet the specificiation provided in WSS 9-33.2(1) – Geotextile Properties (Table 3) for soil separation. The geotextile should be installed in conformance with the specifications provided in WSS 2-12 – Construction Geosynthetic.

Stabilization Material: In the case of unsuitable or unstable pavement subgrade conditions, stabilization material consisting of pit- or quarry-run rock or crushed rock should be placed below the above-described pavement sections. The material should have a maximum particle size of 6-inches and less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve, have at least two mechanically fractured faces, and be free or organic matter or other deleterious material. Material meeting the specification provided in WSS 9-27.3(6) – Stone is generally acceptable for use. Stabilization material should be placed in lifts between 12 and 18 inches thick and compacted to a firm condition with a smooth-drum roller without using vibratory action.

Drainage and Groundwater Considerations

The Contractor should be made responsible for temporary drainage of surface water and groundwater as necessary during construction to prevent standing water and/or erosion at the site.

As a matter of good construction practice, we recommend that perimeter drains be installed for all buildings. Perimeter drains should consist of perforated drainpipe embedded in a zone of free draining fill that is wrapped in a non-woven geotextile filter. The pipe should be connected to a tightline drainpipe leading to storm drain facilities. Foundation and crawl space drainage should be sloped to drain to a sump or low point drain outlet. Water should not be allowed to pond within crawl spaces. Roof drains should be connected to a tightline drainpipe leading to storm drain outlet facilities.

Water should not be allowed to collect in the foundation excavations or on prepared subgrades for the foundations/slabs/roadway during construction. Positive site drainage should be maintained throughout construction activities. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff.

The site grading plan should be developed to provide rapid drainage of surface water away from the building areas and to inhibit infiltration of surface water around the perimeter of the buildings and beneath the floor slabs. The grades should be sloped away from the building area. We anticipate stormwater will be routed to the storm system (infiltration facility) to be constructed as part of this development.

Soil Erosion

Site-specific erosion control measures should be implemented to address the maintenance of slopes or exposed areas. This may include silt fence, bio-filter bags, straw wattles, or other suitable methods. During construction, all exposed areas should be well compacted and protected from erosion. Temporary slopes or exposed areas may be covered with straw, crushed aggregate, or rip in localized areas to minimize erosion.

LIMITATIONS

This report was prepared for the exclusive use of Pacific Lifestyle Homes and members of the design team for specific application to the Goodwin Road (Bahu) Property development located at the address noted above. It should be made available to prospective contractors for information on the factual data only, and not as a warranty of subsurface conditions such as those interpreted from the explorations and presented in the discussions of the subsurface conditions included in this report.

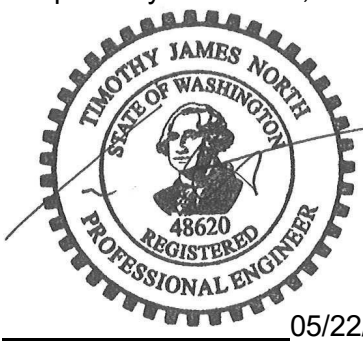
The recommendations contained in this report are based on information derived through subsurface sampling. No matter how effective subsurface sampling may be, variations between exploration location and the presence of unsuitable materials are possible and cannot be determined until exposed during construction. Accordingly, True North’s recommendations can be finalized only through True North's observation of the project's earthwork construction. True North accepts no responsibility or liability for any party's reliance on True North's recommendations.

Within the limitations of the scope, schedule and budget, the analyses, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted professional geotechnical engineering principles and practice in this area at the time this report was prepared. We make no warranty, either express or implied.

CLOSING

We appreciate the opportunity to be of service to you. If you have any questions, or if we can be of further assistance to you, please contact us at (360) 984-6584.

Respectfully Submitted,



05/22/25

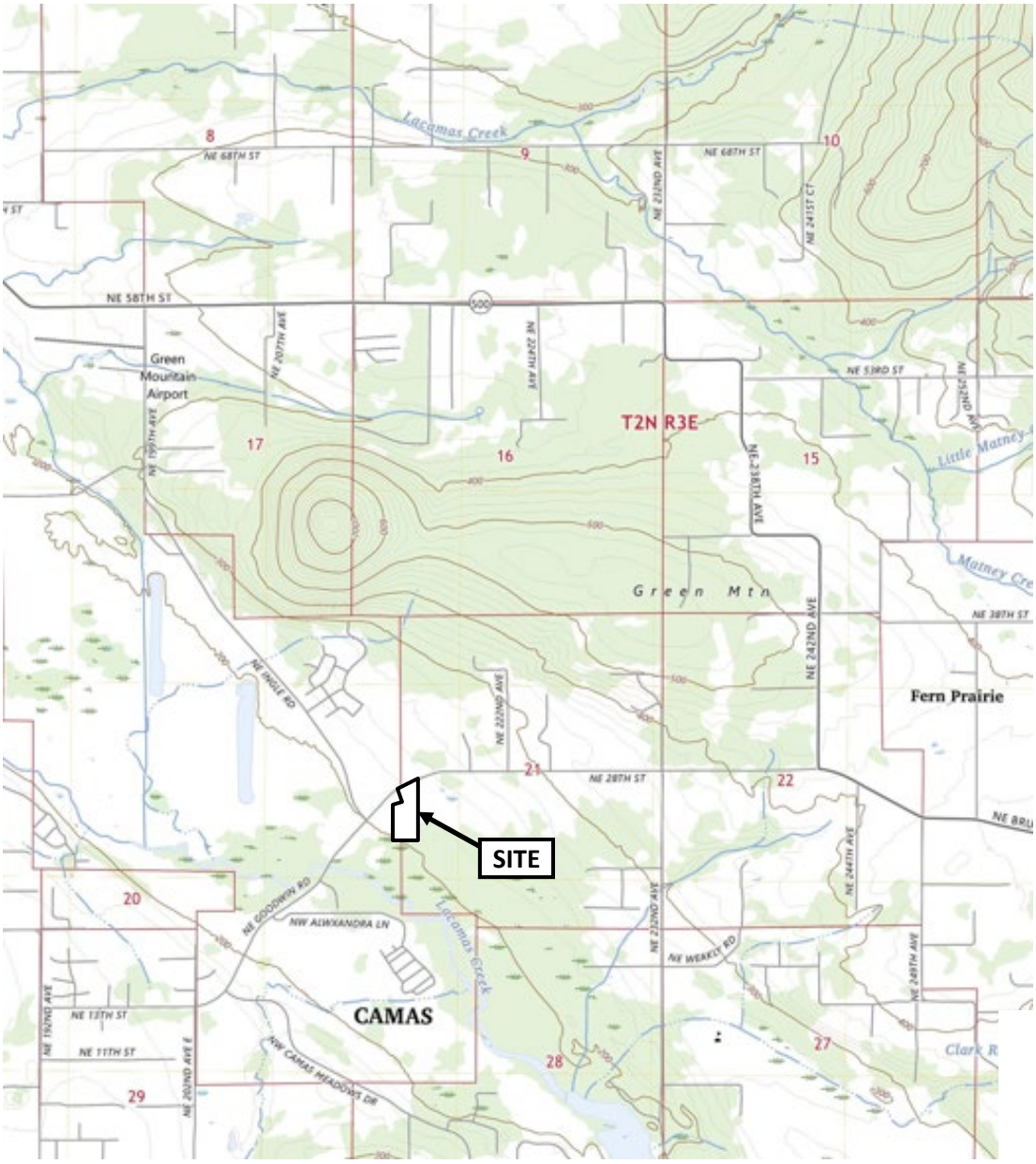
Timothy J. North, P.E.
Principal Geotechnical Engineer

Reviewed By:

Lauren Shepherd, E.I.T.
Staff Geotechnical Engineer

Attachment: Figure 1 – Site Vicinity
Figure 2 – Site Layout and Explorations
Figure 3 – Site Photographs
Appendix A – Field Exploration Methods, Lab Testing Procedures, Exploration Logs

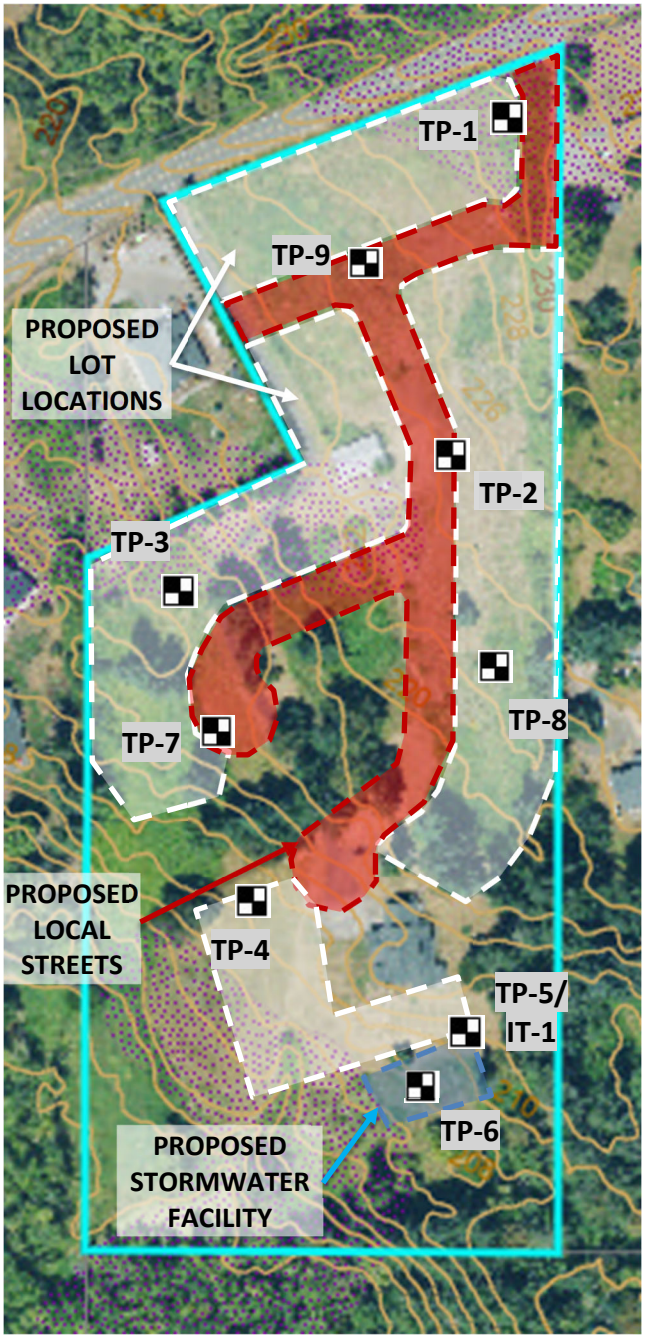
FIGURES



Not to Scale

Source: "Topographic Map of the Lacamas Creek Quadrangle, 7.5 minute series" 2023, United States Geological Survey (USGS).

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 1 – Vicinity Map



TP-1 Approximate Exploratory Test Pit Locations, November 4, 2024, and March 21, 2025.

Source: Aerial & Topo – Clark County MapsOnline, accessed November 18, 2024.

Note: Purple shading indicates mapped hydric soils.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Home Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025 (revised May 2025)	Figure 2 –Site Plan



Photo 1. From the approximate location of TP-1, looking west across the pasture.



Photo 2. From between the two outbuildings, looking north along the private driveway connecting with NE Goodwin Road.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3A – Site Photographs (1 of 5)



Photo 3. From between the existing outbuildings, looking south, towards the existing residence.



Photo 4. From approximate location of TP-3, looking east towards existing outbuildings.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3B – Site Photographs (2 of 5)



Photo 5. From approximate location of TP-4, looking southeast towards existing residence.



Photo 6. From the existing residence, looking west across gentle descending slope to proposed open recreational area.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3C – Site Photographs (3 of 5)



Photo 1. South of the existing residence, looking east, towards the location of TP-6



Photo 2. From the existing driveway, looking southwest towards the existing residence and TP-7, in progress

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3D – Site Photographs (4 of 5)



Photo 3. From north of the existing residence, looking north, towards the location of TP-8



Photo 4. From near the existing barn, looking north towards TP-9, in progress

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Reserve at Green Mountain Camas, Washington	Project # 24-0368-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3E – Site Photographs (5 of 5)

APPENDIX A

Field Exploration Procedures
Laboratory Testing Procedures
Test Pit Logs

FIELD EXPLORATION PROCEDURES

General

We excavated a total of 9 test pits (TP-1 through TP-9) to depths ranging between 4.5 and 11 feet below existing ground surface (bgs) across the proposed development area. The excavations were advanced utilizing a Link-Belt 80 X3 with a 30-inch wide toothed bucket owned and operated by Thompson Brothers Excavating. Soil samples were collected from the major strata encountered in each test pit and at the bottom of each infiltration test pit location The approximate exploration locations are shown in Figure 2.

Soil Sampling

Representative grab samples of the soil observed in the explorations were obtained from the sidewalls or spoils. Samples obtained in the exploration were sealed in airtight, plastic bags to retain moisture and returned to our laboratory for additional examination and testing. The test explorations were loosely backfilled.

Pocket Penetrometer Testing

The undrained shear strength of fine-grained soil (silt and clay) was estimated with a pocket penetrometer applied to the sidewalls of the test pits. A pocket penetrometer is a hand-held device that indicates undrained compressive strength in tons per square foot. The test method is approximate and applicable only to fine-grained soil.

Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, peculiar odors, and other distinguishing characteristics of the soil samples were noted. The terminology used is described in the key and glossary that follow.

Summary Exploration Logs

Results from the explorations are shown in the summary exploration logs. The left-hand portion of a log provides our interpretation of the soil encountered, sample depths, and groundwater information. The right-hand, graphic portion of a log shows the results of pocket penetrometer and laboratory testing. Soil descriptions and interfaces between soil types shown in summary logs are interpretive, and actual transitions may be gradual.

LABORATORY TESTING PROCEDURES

Soil samples obtained during field explorations are examined in our laboratory, and representative samples may be selected for further testing.

Visual-Manual Classification

Soil samples are classified in general accordance with guidelines presented in ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The physical characteristics of the samples are noted and the field classifications are modified, where

necessary, in accordance with ASTM terminology, though certain terminology that incorporates current local engineering practice may be used. The term which best described the major portion of the sample is used to describe the soil type.'

Natural Moisture Content

Natural moisture content is determined in general accordance with guidelines presented in ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass. The natural moisture content is the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of solid particles.

Fines Content

Fines content testing is performed in general accordance with guidelines presented in ASTM D1140, *Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No.200) Sieve in Soils by Washing*. The fines content is the fraction of soil that passes the U.S. Standard Number 200 Sieve. This sieve differentiates fines (silt and clay) from sand and gravel. Soil material that remains on the Number 200 sieve is sand. Material that passes the sieve is fines. The test is used to refine soil type.

TRUE NORTH GEOTECHNICAL
219 West 4th Street, Vancouver, WA
360-984-6584 - tnorthgeo.com

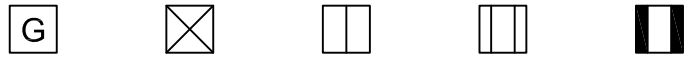
TABLE A1
Key to Test Pit and Boring Terminology and Symbols

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTION
Coarse Grained Soils: More Than 50% Material Retained on No. 200 Sieve	Gravel and Gravelly Soils: More Than 50% Coarse Fraction Retained on No. 4 Sieve	Clean Gravels (Little or No Fines)		GW	Well-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
				GP	Poorly-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		Gravels with Fines (Significant Percentage of Fines)		GM	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand and Sandy Soils: More Than 50% Coarse Fraction Passing No. 4 Sieve	Clean Sands (Little or No Fines)		SW	Well-graded Sands, Gravelly Sands, Little or No Fines
				SP	Poorly-graded Sands, Gravelly Sands, Little or No Fines
		Sands with Fines (Significant Percentage of Fines)		SM	Silty Sands, Sand-Silt Mixtures
				SC	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils: More Than 50% Material Passing No. 200 Sieve	Silts and Clays	Liquid Limit Less than 50 percent		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands, Clayey Silts
				CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays
				OL	Organic Silts and Organic Silty Clays of Low Plasticity
	Silts and Clays	Liquid Limit Greater than 50 percent		MH	Inorganic Silts Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH	Inorganic Clays of High Plasticity, Fat Clays
				OH	Organic Clays of Medium to High Plasticity, Organic Silts
				PT	Peat, Humus, Swamp Soils
Topsoil					Humus and Duff Layer
Fill					Highly Variable Constituents

Relative Density of Coarse-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50+

Consistency of Fine-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 -8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	30 - 50
Very Hard	50+

Key to Sampler Type Symbols



Grab | SPT | Shelby Tube | Dames & Moore | Rock Core

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-1

UTM	: 10T	**Excavator**	: Link-Belt	**Job Number**	: 24-0368-1
Latitude	: 45.58570	**Excavator Supplier**	: Thompson Brothers Excavating	**Client**	: Pacific Lifestyle Homes
Longitude	: -122.40267	**Logged By**	: LS	**Project**	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	**Reviewed By**	: TJN	**Location**	: Camas, Washington, USA
Total Depth	: 10 ft BGL	**Date**	: 11/04/2024	**Loc Comment**	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1	S1		ML	Soft, dark brown, SILT, some clay; rooted to 8 inches bgs; slightly moist.	32		1.0	
2							0.75	
3	S2		CL-ML	Soft to medium stiff, red brown, CLAYEY SILT, some sand; very moist.	24	70	1.5	
4							1.5	
5 ▼								
6			SM	Medium dense to dense, gray brown, POORLY GRADED SILTY SAND; wet.				
7	S3				41	49		
8								
9	S4		GP-GC	Dense, tan gray, POORLY GRADED GRAVEL AND BOULDERS, some clay; boulders up to 22 inches in diameter; wet.	55			

Groundwater encountered at 5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-2

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0368-1
Latitude	: 45.58570	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.40267	Logged By	: LS	Project	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	Reviewed By	: TJN	Location	: Camas, Washington, USA
Total Depth	: 11 ft BGL	Date	: 11/04/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1–2				Fill- soft to medium stiff, red brown, SILT, some clay; rooted to 8 inches bgs; moist.				
2				Fill- dense, gray, POORLY GRADED GRAVEL; moist.				
3–8	S1		CL-ML	Soft to medium stiff, dark blue-gray to black, SILTY CLAY; moist to very moist.	26	68	2.5 1.5	
9	S2		GW	Medium dense to dense, dark blue-gray, WELL-GRADED GRAVEL AND COBBLES WITH SAND; cobbles up to 8 inches in diameter; wet.	30			
10	S3				39			
				Groundwater encountered at 8.5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

True North Geotechnical
219 W. 4th Street Vancouver, WA 98660
Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-3

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0368-1
Latitude	: 45.58570	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.40267	Logged By	: LS	Project	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	Reviewed By	: TJN	Location	: Camas, Washington, USA
Total Depth	: 4.5 ft BGL	Date	: 11/04/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Soft to medium stiff, dark brown, SILT, some clay; rooted to 6 inches bgs; moist.			2.0	
2				Stiff, red brown, SILTY CLAY WITH GRAVEL AND BOULDERS; with boulders up to 3 feet in diameter; moist.			1.0	
3	S1		CL-ML		15	69	2.0	
4							4.5+	
				Refusal due to practical equipment failure. No groundwater encountered. Test pit backfilled with excavated soils and tamped to grade.				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-4

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0368-1
Latitude	: 45.58570	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.40267	Logged By	: LS	Project	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	Reviewed By	: TJN	Location	: Camas, Washington, USA
Total Depth	: 6.5 ft BGL	Date	: 11/04/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1	S1		ML	Soft to medium stiff, dark brown, SILT, some clay; rooted to 6 inches bgs; moist.	24	57	1.0	
2			SC	Stiff, gray brown with red mottling, SANDY CLAY WITH GRAVEL, some cobbles; slightly moist.			1.5	
3	S2				19		4.5+	
4							4.5+	
5			SP	Medium dense, red brown, POORLY GRADED SAND, some clay; very moist.				
6 ▼	S3				37	39		

Groundwater encountered at 6 feet bgs. Test pit backfilled with excavated soils and tamped to grade.

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-5

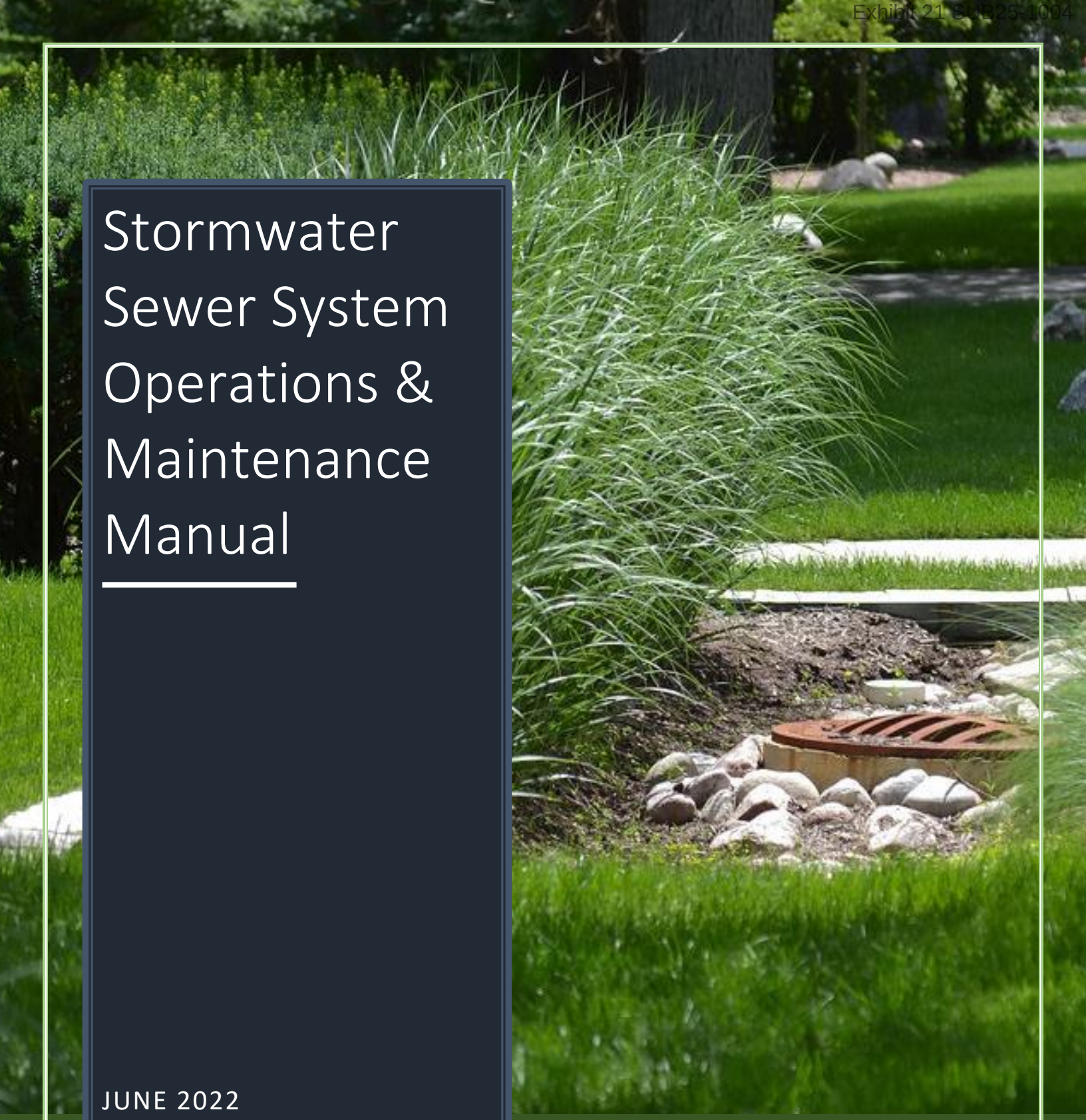
UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0368-1
Latitude	: 45.58570	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.40267	Logged By	: LS	Project	: Goodwin Road (Bahu Property)
Ground Elevation	: Not Surveyed	Reviewed By	: TJN	Location	: Camas, Washington, USA
Total Depth	: 6.5 ft BGL	Date	: 11/04/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Medium stiff, dark brown, SILT, some clay; rooted to 4 inches bgs; moist.			2.0	
	S1				21			
2							1.5	
3			GM	Dense, gray, SILTY GRAVEL; slightly moist.			4.5+	
4			CL-ML	Stiff, red brown with gray and red mottling, SILTY CLAY; dry to slightly moist.			4.5+	
	S2				22	53		Infiltration testing completed at 4.5 feet bgs
5								
	S3				16			
6			GM	Very dense, gray brown, SILTY GRAVEL AND BOULDERS; with boulders up to 24 inches in diameter; dry to slightly moist.				

Terminated due to practical equipment refusal. Groundwater not encountered.
Test pit backfilled with excavated soils and tamped to grade.

APPENDIX D

Operations and Maintenance Manual



Stormwater Sewer System Operations & Maintenance Manual

JUNE 2022

City of Camas
Stormwater Division | Public Works

City of Camas WASHINGTON

Page left blank intentionally

Table of Contents

Introduction 5
Background 5
Purpose 5
Manual Layout 6
Emergent Treatment Technologies 6
Mosquito Control 6
Material Disposal and Spills 6
Vegetated Facilities 8
Biofiltration Swale 8
Wet Biofiltration Swale 9
Filter Strip 10
Detention Pond 11
Wet Pond 12
Infiltration Facility 13
Rain Garden 14
Bioretention 16
Conveyance Ditch 17
Stormwater Structures 18
Catch Basin 18
Field/Ditch Inlet 19
Manhole 21
Debris Barrier 23
Sediment Trap 24
Energy Dissipater 26
Discharge Point 27
Oil/Water Separators 28
Flow Control Structures/Flow Restrictors 29
Storm Sewer Pipe 30
Closed Detention System 31

Drywell 32
Pond Leveler System 33
Dispersion Trench 34
Special Facilities 35
Manufactured Media Filter 35
Permeable Pavement 36
Modular Wetland 37
Tree Box Filter 38
Miscellaneous Items 39
Fences, Gates and Water Quality Signs 39
Access Roads and Easements 41
Pavement Sweeping 42
Repair/Replacement Activities 43
Minor Culvert Repair (Not in a Stream) 43
Major Culvert Repair (at a Stream Crossing) 43
Vegetation Management 44
Integrated Pest Management (IPM) Principles 44
Plants and Groundcover 45
References 46

Introduction

Background

All public and privately owned, roads, parking lots, residential developments, commercial or industrial developments, or school facilities have various components that make up a storm system. These components consist of conveyance pipes, catch basins, manholes, roadside ditches, stormwater facilities (such as bioswales, detention ponds, wet ponds, treatment filters, etc.), landscaping and any other structure that collects, conveys, controls, and/or treats stormwater. Regardless of the component, all storm systems eventually discharge into 'waters of the state' which are streams, rivers, lakes, and wetlands.

Under the Federal Clean Water Act (FCWA) and in compliance with the Department of Ecology's NPDES Phase II Permit, 'waters of the state' are to be protected from contamination. This in turn protects threatened and endangered species under the Federal Endangered Species Act (FESA).

One way to protect 'waters of the state' is to provide the proper maintenance of all storm system components. It is the responsibility of the City of Camas (City) to ensure that all components of the public storm system be properly maintained and operated. The City is responsible for those components that are located within the City's right-of-way, such as the conveyance pipes, manholes, catch basins, roadside ditches, and stormwater facilities. A large part of the stormwater facilities in the City are privately owned and maintained by the property owners. These property owners include, but are not limited to, Homeowners Associations (HOAs), school district, businesses, and commercial/industrial site owners.

Purpose

This manual is intended to help, both public and private stormwater facility maintenance operators, meet the requirements of City Municipal Code 14.02.090 for proper maintenance and operation of the various storm system components. Proper maintenance will help to assure that:

- Stormwater facilities operate as they were designed;
- Storm systems are cleaned of the pollutants that they trap, such as sediment and oils, so that storm systems are not overwhelmed and become pollutant sources;
- Pollutant sources are removed, or minimized, prior to entering the storm system.

Along with keeping a site from flooding, properly maintained storm system can help reduce surface water and groundwater pollution. Most sites have some type of stormwater control component designed to limit the environmental and flooding damage caused by stormwater runoff. These components require more labor intensive maintenance than a system of pipes and catch basins.

Manual Layout

This manual is broken out into various best management practice (BMP) maintenance components. For each BMP maintenance component, this manual will:

- Briefly describe the component type, e.g. facility or activity.
- Describes potential maintenance issues and/or problems.
- Describes conditions when maintenance is required.
- Minimum performance standards and suggested maintenance methods.

Additional information may be found in other manuals, such as the Washington Department of Ecology's *Stormwater Management Manual for Western Washington (SWMMWW), Vols. V*, and Ecology's LID manual.

Inspection of a stormwater facility will determine if conditions require a maintenance action. The maintenance standard is not the required condition at all times. Exceeding a condition, between inspections and/or maintenance, does not automatically constitute a violation of these standards. The inspection and maintenance schedules should be adjusted to minimize the length of time that a facility is in a condition that requires maintenance.

Emergent Treatment Technologies

Some stormwater treatment facilities are designed and installed with emerging technologies that are not standard at the time of their installation. If not found in this manual, a treatment facility may be an emerging technology approved by Washington Department of Ecology; the maintenance standards can be found at Emerging Stormwater Treatment Technologies.

Mosquito Control

Mosquitoes are annoying and sometimes pose a serious risk to public health. They can transmit diseases such as West Nile Virus and equine encephalitis. Above-ground stormwater facilities should be designed to allow water to flow through or infiltrate in less than 48 hours. Presence of mosquitos in a stormwater facility may indicate a clogged outlet, compromised infiltration capacity, or other defect that should trigger inspection and may require maintenance.

If mosquitos are identified during a stormwater facility maintenance or inspection and are a concern, a request to the Clark County Mosquito Control District for service or information regarding mosquito control can be made online at Mosquito Control District or at the 24-hour request line, 360-397-8430.

Material Disposal and Spills

The disposal of waste, e.g. sediment or standing water, from the maintenance of the stormwater facilities and storm system components shall be conducted in accordance with federal, state, and local regulations, including the Solid Waste Handling Standards chapter 173-350 WAC, Minimum Functional Standards for Solid

Waste Handling chapter 173-304 WAC and Appendix IV-B: Management of Street Waste Solids and Liquids of the SWMMWW. Dangerous waste must be handled following, Dangerous Waste Regulations chapter 173-303 WAC. Vegetation to be recycled and disposed of at local receptacle locations.

For major spills, coordinate removal/cleanup with the City at 360-817-1563 and notify Department of Ecology at 360-407-6300.

Vegetated Facilities

Biofiltration Swale

Biofiltration swales use grass or other dense vegetation to filter sediment and oily materials out of stormwater. Usually, they look like flat-bottomed channels with grass growing in them. As water passes through the vegetation, pollutants are removed through the effects of filtration, infiltration and settling.

See SWMMWW Appendix V-A, Table V-A.8 for biofiltration swale maintenance standards. If available, reference record drawings for seed mix and groundcover replacements, or see SWMMWW BMP T9.10, Tables V-7.3 and V-7.4. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.



Wet Biofiltration Swale

A wet biofiltration swale is a variation of basic biofiltration swale for use where the centerline slope is slight, groundwater table are high, or a continuous low base flow is likely to result in wet soil conditions for long periods of time. Where continuously wet soil exceeds about 2 weeks, typically grasses will die. Thus, vegetation specifically adapted to wet soil conditions is needed. Different vegetation requires modification of several of the design and maintenance requirements from the basic biofiltration swale.

See SWMMWW Appendix V-A, Table V-A.9 for wet biofiltration swale maintenance standards. If available, reference record drawings for seed mix and groundcover replacements, or see SWMMWW BMP T9.20, Table V-7.5. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.



Filter Strip

Filter strips are linear strips of grass that remove sediment and oils from stormwater by filtering it. Stormwater is treated as it sheet flows across the filter strip. Usually, filter strips are placed along the edge of linear paved areas, such as parking lots and roads. Where designed filter strips are installed; road shoulders should only be graded to maintain level flow off the road.

See SWMMWW Appendix V-A, Table V-A.10 for filter strip maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP T9.10, Table V-7.3.



Detention Pond

Detention pond facilities are designed to hold and slowly release stormwater by use of a pond with a specially designed control structure. Styles vary greatly from well-manicured to natural appearing. Generally, native vegetation is preferred for reduced maintenance and enhance wildlife habitat. Some facilities are designed to appear as natural water bodies or are in a park-like setting.

See SWMMWW Appendix V-A, Table V-A.1 for detention pond maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP D.1, Table V-12.3. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.



Wet Pond

A wet pond is an open basin that retains a permanent pool of water year-round or only during the wet season. The volume of the wet pond allows sediment and other pollutants to settle out of the runoff. Wetland vegetation is typically planted within the wet pond to provide additional treatment through nutrient removal. Detention quantity control can be provided with additional temporary storage volume above the permanent pool elevation.

See SWMMWW Appendix V-A, Table V-A.11 for wet pond maintenance standards. If available, reference record drawings for seed mix and plants replacement, or see SWMMWW BMP D.1, Table V-12.3 for seed mix and BMP T10.10, Table V-8.1 for plants. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.



Infiltration Facility

Infiltration facilities dispose of water by holding it in an area where it can soak into the ground. These are open facilities that may either drain rapidly and have grass bases or have perpetual ponds where water levels rise and fall with stormwater flows. Infiltration facilities may be designed to handle all of the runoff from an area or they may overflow and bypass larger storms.

Since the facility is designed to pass water into the ground, generally after passing through a sediment trap/manhole, anything that can cause the base to clog will reduce the performance and is a large concern. Generally, infiltration basins are managed like detention ponds, but with greater emphasis on maintaining the capacity to infiltrate stormwater.

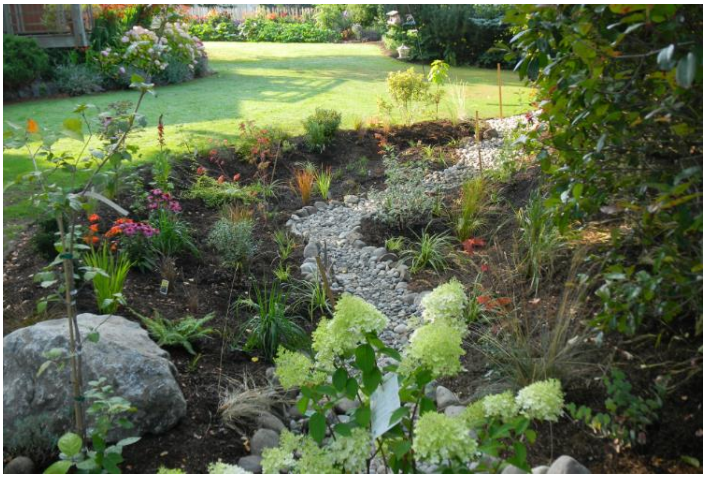
See SWMMWW Appendix V-A, Table V-A.2 for infiltration facility maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP D.1, Table V-12.3. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.



Rain Garden

Rain gardens are non-engineered, shallow, landscaped depressions with compost-amended soils and adapted plants. The depression temporarily stores stormwater runoff from adjacent areas. Some or all the influent stormwater passes through the amended soil profile and into the underlying native soil. Stormwater that exceeds the storage capacity is designed to overflow to an adjacent drainage system.

If available, reference record drawings for plant replacements, or see Rain Garden Handbook for Western Washington, Appendix A for recommendation on rain garden plants. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.



Rain Garden			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Evidence of trash and debris	Remove trash and debris
Side slopes	Erosion	Persistent soil erosion on slopes	Replenish mulch areas throughout rain garden - on the sides and bottom of the rain garden and around the perimeter (and on berm if applicable).
Bottom area	Sediment	Visible sediment that reduces drainage rate	Remove sediment accumulation
		Sediment deposited from water entering the rain garden	Remove sediment, determine the source, and stabilize area
	Leaves	Matted accumulation of leaves reducing drainage rate	Remove leaves
Ponded water	Ponding	Ponded water remains for more than 3 days after the end of a storm	Remove sediment, leaf litter and/or debris accumulation
Pipe inlet/outlet	Pipe	Water is backing up in pipe	Clear pipes of sediment and debris with snake and/or flush with water
		Damaged or cracked drain pipes	Repair or seal cracks, or replace as needed
Inlet rock pad	Erosion	Rock or cobble is removed, missing and flow is eroding soil.	Replace rock and reestablish pad
Weeds	Weeds	Weeds are present	Remove weeds and apply mulch after weeding
Vegetation	Dying Vegetation	Dying, dead or unhealthy plants	Remove diseased plants or plant parts and dispose, then replace
	Sight Distance	Vegetation reduces sight distances and sidewalk	Keep sidewalks and sight distances on roadways clear
	Blockage	Vegetation is crowding inlets and outlets	Remove vegetation crowding inlets and outlets
	Poor Vegetation Growth	Yellowing, poor growth, poor flowering, spotting or curled leaves, weak roofs, or stems	Test soil to identify specific nutrient deficiencies.
			Do not use synthetic fertilizers
			Consider selecting different plant for soil conditions
Mulch	Bare Soil	Bare spots are present or mulch depth less than 2 inches	Supplement mulch with hand tools to a depth of 2 to 3 inches, keep mulch away from woody stems.

Bioretention

Bioretention facilities are engineered facilities that store and treat stormwater by filtering it through a specified soil profile. Water that enters the facility ponds in an earthen depression or other basin (e.g., concrete planter) before it infiltrates into the underlaying bioretention soil. Stormwater that exceeds the surface storage capacity overflow to an adjacent drainage system. Treated water is either infiltrated into the underlying native soil or collected by an underdrain and discharged. An underdrain system can be comprised of perforated or slotted pipe, wrapped in an aggregate blanket.

See SWMMWW Appendix V-A, Table V-A.21 for bioretention maintenance standards. If available, reference record drawings for plant replacements, or see LID Technical Guidance Manual for Puget Sound, Appendix 1 for plant recommendations. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.



Conveyance Ditch

Ditches are often manmade open-channels that convey stormwater runoff. These ditches are maintained to prevent localized flooding.



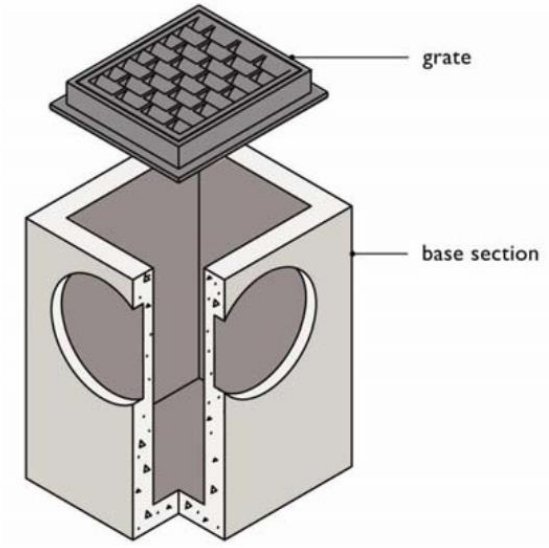
Conveyance Ditch			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Sediment	Sediment exceeds 20% of ditch depth or affects the historic or designed hydraulic capacity.	Remove sediment deposits. When finished, ditch should be level from side to side and drain freely in intended direction.
	Standing Water	Excessive standing water in ditch between storms due to ditch not draining freely	If possible, repair cause of poor drainage. This may include but is not limited to the following activities: remove sediment or trash blockages, improve grade of ditch.
	Eroded or Unstable Side Slopes	When grass is sparse, bare or eroded, patches occur in more than 20% of the ditch	Determine why grass growth is poor and correct that condition. Replant with plugs of grass at eight-inch intervals or reseed. If cause is excessive moisture replace grass with wetland plantings.
	Vegetation	Grass is excessively tall (greater than 15 inches). Nuisance weeds and other vegetation start to take over ditch.	Mow vegetation and/or remove nuisance vegetation so that flow is not impeded. Grass should be mowed to a height of 3 to 4 inches.
	Bare Soil	Poor vegetation coverage.	Reseed poor vegetation areas. Reference "Low Grow" seed mix, see SWMMWW BMP C120 Table II-3.4
	Inlet/Outlet Pipes or Culverts	Inlet/outlet area clogged with sediment and/or debris	Remove material so that there is no clogging or blockage in the inlet and outlet area
	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from ditch.
	Erosion/Scouring	Eroded or scoured ditch bottom	Permanently stabilize ditch bottom

Stormwater Structures

Catch Basin

A catch basin is an underground concrete structure with a slotted grate that collects stormwater runoff and route it through the underground pipes. Catch basins typically provide a sump below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. Some catch basins are fitted with a spill control device such as an inverted elbow on the outlet pipe to control grease or oils. The most common tool for cleaning catch basins is a vactor truck which is used to remove sediment and debris from the sump. The sediment and oils if not removed from the catch basins have the potential to pollute downstream waterbodies. Unless you have Occupational Safety and Health Administration (OSHA) approved confined space training and equipment, never enter a catch basin. There is a considerable risk of poisonous gas and injury.

See SWMMWW Appendix V-A, Table V-A.5 for catch basin maintenance standards.



Field/Ditch Inlet

An inlet is a concrete, plastic or steel structure fitted with a slotted grate to collect stormwater runoff and route through underground pipes. A field inlet has a flat grate, and a ditch inlet has an angled grate. These inlets typically provide a sump below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. Some of these inlets are fitted with a spill control device such as an inverted elbow on the outlet pipe to control grease or oils. The most common tool for cleaning out the inlet is a vactor truck which is used to remove sediment and debris from the sump. The sediment and oils if not removed from the inlet has the potential to pollute downstream water bodies. Unless you have OSHA approved confined space training and equipment, never enter an inlet. There is a considerable risk of poisonous gas and injury.



Field Inlet

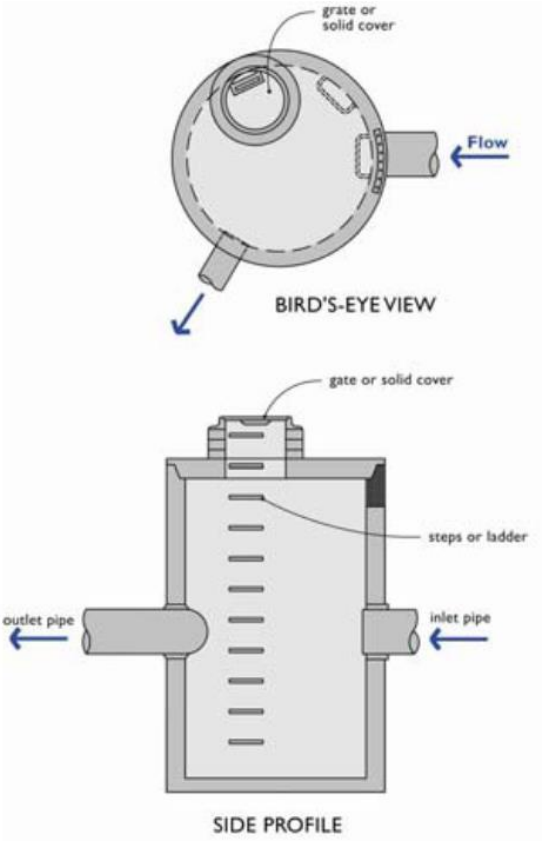


Ditch Inlet

Field Inlet/Ditch Inlet			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash & Debris	Trash or debris blocking inletting capacity by more than 10%.	Remove trash or debris blocking grate opening.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	Remove dead animals or vegetation present within the field/ditch inlet.
	Sediment	Sediment has accumulated to within six inches of the invert of the lowest pipe	Remove sediment
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch.	Repair top slab to be free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Make adjustments so that frame is sitting flush on the riser rings or top slab and is firmly attached.
	Fractures or Cracks in Field Inlet Walls/Bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Regrout pipe and secure at field inlet wall.
	Settlement/ Misalignment	If failure of field inlet has created a safety, function, or design problem.	Replace or repair field inlet to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the inlet opening.	Remove vegetation blockage from basin opening.
	Contamination and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
Metal Grates	Grate Not in Place	Grate is missing or only partially in place. Any open field inlet requires maintenance.	Replace missing grate, cover field inlet
	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Repair grate opening
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Replace missing grate or repair broken member(s)

Manhole

Manholes are large cylindrical underground structures usually set at storm sewer pipe connections. Manholes are used in storm sewer system at any change in direction, slope, pipe material or pipe size. Some manholes have sumps and fitted with stormwater flow control structures such as orifices or weirs. Unless you have OSHA approved confined space training and equipment, never enter a manhole. There is a considerable risk of poisonous gas and injury.

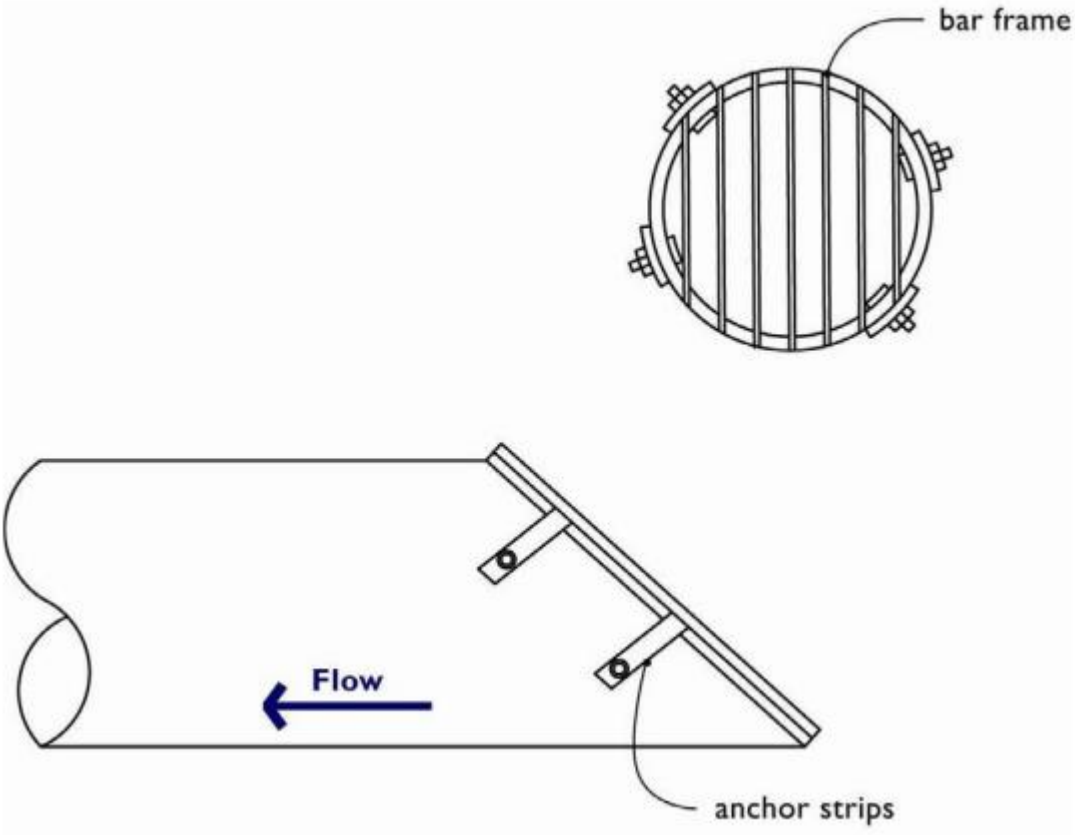


Manhole			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Trash or debris has accumulated to within six inches of the invert of the lowest pipe.	Remove all trash or debris from manhole.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Remove trash or debris from inlet and outlet pipes.
	Sediment	Sediment has accumulated to within six inches of the invert of the lowest pipe.	Remove all sediment from manhole
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch.	Repair top slab to be free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Make adjustments so that frame is sitting flush on the riser rings or top slab and is firmly attached.
	Fractures or Cracks in Manhole Walls/Bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering manhole through cracks.	Regrout pipe and secure at manhole wall.
	Settlement/ Misalignment	If failure of manhole has created a safety, function, or design problem.	Replace or repair manhole to design standards.
Cover	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.	Replace missing cover, cover manhole.
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Repair opening mechanism
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure.	Make adjustments so that one maintenance person can remove the manhole cover.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Repair or replace ladder to meet design standards and allow maintenance person safe access.
Control Structure/Flow Restrictor	See Control Structure/Flow Restrictor		

Debris Barrier

Debris barriers and trash racks are barred covers to pipe openings. They prevent large objects from entering pipes and keeps pets and people out of the pipes as well.

See SWMMWW Appendix V-A, Table V-A.6 for debris barrier maintenance standards.



Profile View

Sediment Trap

A sediment trap is a concrete structure typically fitted with slotted grate or multiple slotted grates. The concrete structure provides a storage volume (sump) below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. A sediment trap can be a fully enclosed concrete structure (above or below ground) with a sump, inlet pipe(s) and outlet pipe.



Sediment Trap			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Trash and debris which is located immediately in front of the sediment trap opening or is blocking the inlet capacity of the basin by more than 10%	Remove trash and debris
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	Remove dead animals or vegetation present within the sediment trap.
	Sediment (non-enclosed structure)	Sediment depth exceeds 2 inches.	Remove sediment
	Sediment (enclosed structure)	Sediment depth within 6 inches from lowest invert	Remove sediment
	Fractures or Cracks in Sediment Trap	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering sediment trap through cracks.	Regrout pipe and secure at sediment trap wall.
	Settlement/ Misalignment	If failure of sediment trap has created a safety, function, or design problem.	Replace or repair sediment trap to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the sediment trap opening	Remove vegetation
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Remove contaminants and/or pollutants. (Coordinate removal/cleanup with local water quality response agency)
Slotted Grate	Trash and Debris	Trash and debris that is blocking more than 20% of the grate surface inlet capacity	Remove trash and debris from grate
	Damaged or Missing Grate	Grate missing or broken member(s) of the grate	Replace or repair grate to design standards.
Cover (enclosed structure)	Cover Not in Place	Cover is missing or only partially in place.	Replace missing cover
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure or latch broken	Make adjustments so that one maintenance person can remove the cover and/or repair broken latch.

Energy Dissipater

Energy dissipaters are critical for preventing erosion at storm drain outfalls. There are a variety of designs, including wire gabion baskets, rock splash pads, trenches, and specially designed pools or manholes. They are installed on or near the inlet or outlet to a closed pipe system to prevent erosion at these locations.

See SWMMWW Appendix V-A, Table V-A.7 for energy dissipater maintenance standards.



Discharge Point

Stormwater facility discharge points may convey drainage from the stormwater facility into open channels, ditches, ponds, wetlands, streams, or lakes. Stormwater facility discharge points need to be assessed to make sure stormwater is not causing any negative impacts to these drainage areas.



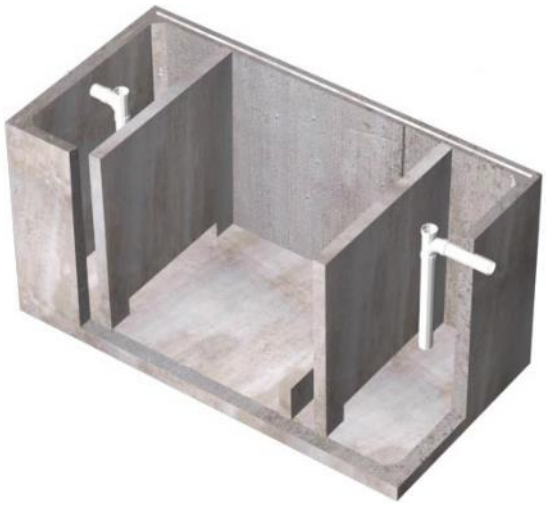
Discharge Point			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Monitoring	Contaminants and Pollution	Any evidence of oil, gasoline, sewage, contaminants, or other pollutants	Identify and remove source. The effluent discharge should be clear and free of odor. Notify City at (360) 817-1567.
	Ditch or Stream Banks Eroding	Erosion, scouring, or head cuts in ditch or stream banks downstream of facility discharge point due to flow channelization or higher flows.	Stabilize ditch or stream banks. Report to City for engineer evaluation.
General	Missing or Moved Rock	Only one layer of rock exists above native soil in an area five square feet or larger, or any exposure of native soil	Replace or repair rock pad to design standards
	Erosion	Soil erosion in or adjacent to rock pad	Replace or repair rock pad to design standards
	Sediment	Sediment blocking 20% of the pipe diameter	Remove sediment
	Obstructions	Roots or debris enters pipe or deforms pipe, reducing flow	Remove roots from pipe by mechanical methods; do not use root-dissolving chemicals in storm sewer pipes. If necessary, remove vegetation over the line.
	Pipe Rusted or Deteriorated	Any part of the piping that is crushed or deformed excessively or any other failure to the piping	Repair or replace pipe
Energy Dissipater	See Energy Dissipater		

Oil/Water Separators

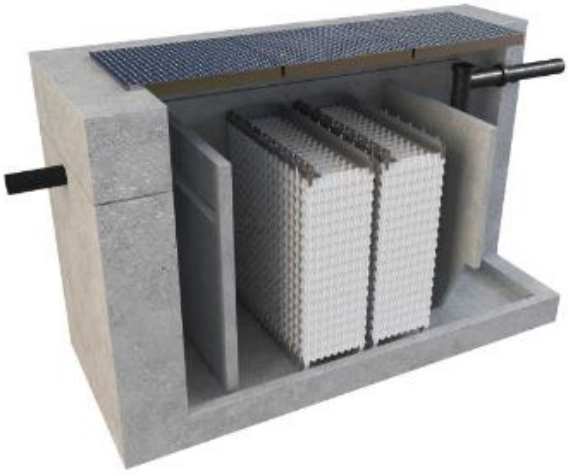
An oil/water separator is an underground vault that treats stormwater by mechanically separating oil from water. The oil rises to the surface and floats on the water and sediment settles to the bottom. Oil/water separators are typically utilized in locations where high oil concentrations in the stormwater runoff are anticipated (e.g., service and fuel stations). Oil/water separators are most commonly used as the first pretreatment facility in a series of stormwater management facilities.

These facilities have special problems for maintenance and should be serviced by contractors. The main issues are working in confined spaces and properly handling any sludge and oil cleaned from vaults or oil/water separators. Manufacturer's recommendations for maintenance should be followed at a minimum.

See SWMMWW Appendix V-A, Table V-A.16 for baffle oil/water separator maintenance standards and Table V-A.17 for coalescing plate oil/water separator maintenance standards.



Baffle Oil/Water Separator

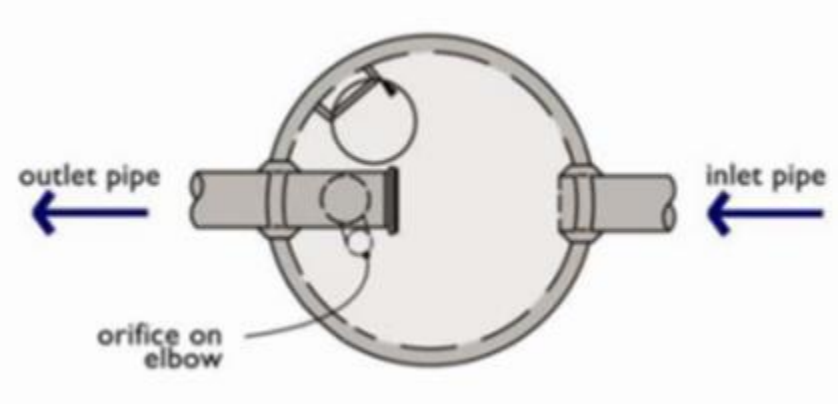


Coalescing Plate Oil/Water Separator

Flow Control Structures/Flow Restrictors

Flow control structures and flow restrictors direct or restrict flow in or out of facility components. Outflow controls on detention facilities are a common example where flow control structures slowly release stormwater at a specific rate. The flow is regulated by a combination of orifices (holes with specifically sized diameters) and weirs (plates with rectangular or 'V' shaped notch). Lack of maintenance of the control structure can result in the plugging of an orifice. If these flow controls are damaged, plugged, bypassed, or not working properly, the facility could overtop or release water too quickly.

See SWMMWW Appendix V-A, Table V-A.4 for control structure/flow restrictor maintenance standards.



Plan View

Storm Sewer Pipe

Storm sewer pipes convey stormwater. Storm pipes are constructed of many different types of materials and are sometimes perforated to allow groundwater to be collected by the storm system. Storm pipes are cleaned to remove sediment or blockages when problems are identified. Storm pipes must be clear of obstructions and breaks to prevent localized flooding.



Storm Sewer Pipe			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Obstructions, Including Roots	Obstruction exists in pipe, reducing flow capacity	Remove obstruction. Use mechanical methods. Do not put root-dissolving chemicals in storm sewer pipes. If necessary, remove the vegetation over the line.
	Pipe Dented or Broken	Inlet/outlet pipe damaged or broken	Repair or replace pipe
	Pipe rusted or deteriorated	Any part of the piping that is crushed or deformed excessively or any other failure to the piping	Repair or replace pipe
	Sediment and Debris	Sediment or debris depth is greater than 15% of the pipe diameter	Clean pipe. Evaluate source of sediment upstream of the pipe and stabilize if possible.
	Broken Trash Screen	Trash screen is broken or missing parts	Repair or replace trash screen
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.

Closed Detention System

A closed detention system functions similarly to a detention pond but with the storage volume provided by an underground structure. The structure is typically constructed of large diameter pipe, plastic chamber structure or a concrete vault. These systems are typically utilized for sites that do not have space available for an above-ground system and are more commonly associated with commercial sites.

Underground detention systems are enclosed spaces where harmful chemicals and vapors can accumulate. Therefore, the maintenance of these facilities should be conducted by an individual trained and certified to work in hazardous confined spaces.

See SWMMWW Appendix V-A, Table V-A.3 for closed detention maintenance standards.



Drywell

Drywells are perforated, open-bottomed manholes used to infiltrate stormwater into the ground. While not the intended use, drywells trap sediment and some of the oil pollutants in stormwater runoff. Drywells are more likely to fill with oily sediment in areas that lack swales or other treatment facilities. Fine oil sediment can clog drywells and lead to localized street flooding. Also, pollutants discharged into drywells can migrate into groundwater. Drywells were often installed in closed topographic depressions, areas with will-drained soils, or areas having inadequate storm sewers. Often, drywells contain groundwater.



Drywell			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Does not Dissipate Stormwater	Does not dissipate stormwater	Replace or repair
	Opening Clogged	Openings are clogged, reducing capacity	Clear openings or convert existing drywell to a sediment trap and install a new drywell or drainage trench. To convert to a sediment trap: grout holes, cover base with concrete, and add piping. Alterations to any storm facility cannot be done without approval from the City of Camas.
	Standing Water	Standing water indicates the drywell is into the groundwater table	Rebuild drywell to prevent stormwater from going directly into groundwater
	Trash and Debris	Trash or debris blocking any inlet or outlet pipe	Remove trash and debris
	Sediment	Sediment in drywell exceeds 60 percent of the depth below the lowest pipe	Remove sediment
	Structure Damage	Structure unsound	Replace or repair drywell to design standards.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
Cover	Cover Not in Place	Cover is missing or only partially in place.	Replace missing cover
	Cover Difficult to Remove	One maintenance person cannot remove cover after applying normal lifting pressure.	Make adjustments so that one maintenance person can remove the drywell cover.

Pond Leveler System

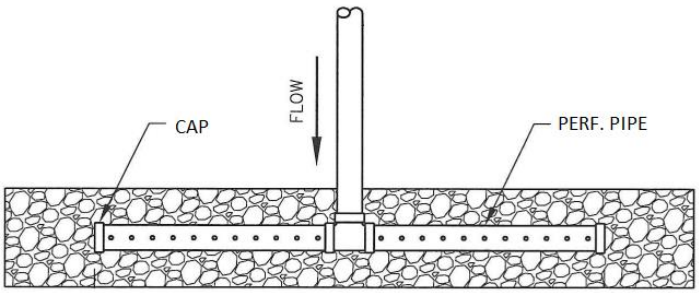
The pond leveler system consists of an intake cage and outlet pipe. This system is used to bypass beaver dams. The pond leveler system creates a permanent leak through the beaver dam that the beavers cannot stop.



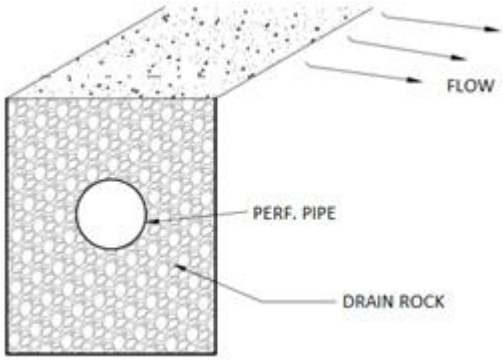
Pond Leveler			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Intake Cage	Debris and sediment	Debris and sediment build up around cage	Remove debris and sediment build up around cage. Recommended tools: potato rake and a narrow, stiff shop broom.
	Structure	Broken cage, resulting in holes larger than 6" diameter.	Repair hole with similar cage material, attach with hog rings.
	Obstruction to inflow pipe	Debris obstructing pipe flow inside intake cage	Remove obstruction
Outflow Pipe	Obstruction	Debris obstructing outflow	Remove obstruction

Dispersion Trench

Dispersion trench are grave-filled trenches, which serve to spread runoff over vegetated pervious areas. This BMP reduce peak flows, provide some infiltration, and water quality benefits.



Plan View



Cross Section

Dispersion Trench			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from site.
	Poisonous Vegetation and noxious weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations.	Remove noxious weeds. Compliance with State or local eradication policies required. Apply requirements of adopted IPM policies for the use of herbicides.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
	Rodent Holes	Any evidence of rodent holes.	Fill holes.
Perforated Pipe	Sediment and/or obstruction	Sediment and/or obstruction impeding the flow, causing backup	Remove sediment and/or obstruction

Special Facilities

Manufactured Media Filter

Manufacture media filters are passive, flow-through, stormwater treatment systems. They are comprised of manholes or vaults that house media-filled filter cartridges. Stormwater passes through a filtering medium, which traps particulates and/or absorb pollutants such as dissolved metals and hydrocarbons. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharge to a pond or open channel drainage way.

The filter media can be housed in cartridge filters enclosed in concrete vaults or catch basins. Structures will have vault doors or manhole lids for maintenance access. Various types of filter media are available from different manufactures. Determine the type of filter media used and consult manufacturer for maintenance recommendations.

See SWMMWW Appendix V-A, Table V-A.15 for manufactured media filters maintenance standards.

Manufactured Media Filter – Additional Maintenance Standards			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Below Ground Vault or Manhole	Sediment Accumulation in Vault (no first chamber)	Sediment depth exceeds 4-inches on vault floor.	Remove sediment from vault floor. May require replacing media cartridges, consult manufacturer.



Permeable Pavement

Permeable pavement is a paving system which allows rainfall to percolate through the surface into the underlying soil or an aggregate bed, where stormwater is stored and infiltrated to underlying subgrade, or removed by an overflow drainage system.

See SWMMWW Appendix V-A, Table V-A.22 for permeable pavement maintenance standards.



Modular Wetland

Modular wetlands linear is a biofiltration system that utilizes horizontal flow which allows for a smaller footprint, higher treatment capacity and design versatility. This system can be utilized downstream of storage for additional volume control and treatment. The modular wetland is contained in an underground vault that has different chambers containing media. Some modular wetlands can have plants growing out of it, but it is not required for the system to function. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharge to a pond or open channel drainage way.



Modular Wetland			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Missing or damaged components	Missing or damaged internal components or cartridges	Replace missing or repair damaged internal components or cartridges
Inlet or Outlet	Obstruction	Obstruction to inlet or outlet that impedes flow	Remove obstruction
Pretreatment Chamber	Floatables	Excessive accumulation of floatables, in which the length and width of the chamber is fully impacted more than 18"	Remove floatables
	Sediment	Excessive accumulation of sediment, more than 6"in depth	Remove sediment
Filter Cartridges	Sediment	Excessive accumulation of sediment on media, more than 85% clogged (blackish color)	Replace media
Vegetation (if applicable)	Overgrown	Overgrown vegetation	Trim/prune vegetation in accordance with landscaping and safety needs
Structure	Cracks in structure	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through cracks	Repair cracks in vault

Tree Box Filter

Tree box filter is a stormwater treatment system incorporating high performance biofiltration media to remove pollutants from stormwater runoff.



Tree Box Filter			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Inlet	Excessive sediment or trash accumulation	Accumulated sediments or trash impair free flow of water into system	Remove sediment and/or trash
Mulch cover	Trash and debris	Excessive trash and/or debris accumulation	Remove trash and/or debris.
	Standing water	Ponding of water over mulch due to excessive fine sediment accumulation or spill of petroleum oils	Remove mulch and replace, contact manufacturer for advice
Vegetation	Plant not growing or in poor condition	Soil/mulch too wet, evidence of spill, incorrect plant selection, pest infestation, vandalism to plants	Plants should be healthy and pest free, contact manufacturer for advice
	Plant growth excessive	Plants should be appropriate to the species and location	Trim/prune plants in accordance with landscaping and safety needs
Structure	Cracks in structure	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through cracks	Repair cracks in vault

Miscellaneous Items

Fences, Gates and Water Quality Signs

Fences are installed around the perimeter of stormwater facilities as a means of protecting the public, as they restrict entrance to the facility. Gates are installed to allow for maintenance access. Gates will be secured, typically with a double lock system (daisy chain) that allows access to the City and to the property owner's maintenance crew.

Water Quality Signs are installed on the fences, or on sign poles, within public view as a means of educating the public as to the presence of a stormwater facility. These signs also have a number located in the upper right hand corner that is cross referenced, at the City, to an address and maintenance responsibility. The publicly owned storm facility signs are green and the privately owned storm facility signs are white.



Public Storm Sign (Green) **Private Storm Sign (White)**

Fence, Gate and Water Quality Sign			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Gate or Fence Allows Unauthorized Entry	Openings in fence, missing gate, openings beneath fence allowing unauthorized access	Repaired gate and/or fence to prevent unauthorized access
	Locking Mechanism	Mechanism cannot be opened by one maintenance person with proper tools	Repair/replace lock
		No lock on gate, allows unauthorized entry	Add lock
	Damaged Parts	Posts out of plumb more than six inches	Plumb post
		Top rails of plump more than six inches	Repair top rails so that it is free of bends greater than 1 inch
	Erosion	Erosion has resulted in an opening under a fence that allows entry by people or pets	Replace soil under fence so that no opening exceeds 4 inches in height
	Sign	Sign is leaning more than 8 inches off vertical	Reset sign to plumb
		Sign is missing or 20% of surface is unreadable	Replace sign

Access Roads and Easements

Many stormwater facilities have access roads to bring in heavy equipment for facility maintenance. These roads are typically gravel and should be maintained for inspection access and ease of equipment entry. All facilities should allow access for the inspection process. The easement area should be adequately or otherwise stabilized. Bare soil areas will generate higher levels of stormwater runoff and increase erosion and sedimentation in stormwater facilities.

Access Road and Easements			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Erosion	Soils are bare or eroded	Seed or use other stabilization BMP
	Road Surface	Conditions of road surface may lead to erosion of the facility or limit access	Repair road
	Erosion of Ground Surface	Noticeable rills are seen in landscaped areas	Identify causes of erosion and implement BMPs to slow down/spread out the water. Fill, contour, and seed eroded areas. If needed, re-grade affected areas.
	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from site.
	Poisonous Vegetation and Noxious Weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations.	Remove noxious weeds. Compliance with State or local eradication policies required. Apply requirements of adopted IPM policies for the use of herbicides.
	Tree Growth and Hazard Trees	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If dead, diseased, or dying trees are identified.	Remove hazardous tree that impede with maintenance access and activities. Remove trees that are damaging the pipe system and/or blocking drain inlet. Remove dead, diseased, or dying trees. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood).
	Weeds (Non-poisonous)	Weeds growing in more than 20% of the landscaped area (tree and shrubs only).	Remove weeds
	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Destroy or remove insects from site. Apply insecticides in compliance with adopted IPM policies.

Pavement Sweeping

Pavement sweeping is performed as a means of removing sand, dirt, and litter from streets and curb gutters. Sweeping also reduces dust during dry weather. Pavement sweeping plays a large part in stormwater maintenance because it limits the amount of sediment washed into the municipal storm sewer system. The water quality procedure for street sweeping focuses on sediment removal and disposal. Reducing the amount of sediment washed into catch basins, curb inlets, detention facilities, drywells, and other facilities can save money because sweeping is generally cheaper that removing sediment from facilities. Sweeping also helps protect facilities from clogging with sediment.

Typically, the City sweeps the downtown area once a week and the whole city about three times per year. Most of the downtown area does not have water quality treatment. Pavement sweeping is the main source for pollution control.



Repair/Replacement Activities

Minor Culvert Repair (Not in a Stream)

This activity is for the replacement or repair of culverts and inlets. It applies only to structures that are in ditches that are specifically for storm drainage. These are ditches that do not carry water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, consult with the Washington Department of Fish and Wildlife and the City of Camas Public Works Department.

Major Culvert Repair (at a Stream Crossing)

This activity is the replacement or repair of culverts and inlets bridging a stream or ditch with flowing water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, consult the Washington Department of Fish and Wildlife and the City of Camas Public Works Department.

These projects must meet all regulatory requirements such as State Environmental Policy Act (SEPA), Shoreline Permit, Hydraulic Project Approval (HPA) and Flood Plain.



Vegetation Management

The City recognizes the special importance of the rivers, streams, wetlands, ponds, and stormwater control and treatment facilities. The sensitive nature of such habitat, their plant and animal communities, and their direct link with other waterways require that we establish specific policies to ensure their health. All landscape management decisions for controlling unwanted vegetation, diseases, and pests should follow the Integrated Pest Management (IPM) principles and decision-making rationale.

Integrated Pest Management (IPM) Principles

1. Correctly identify the pest problem and understand their life cycle. Refer to online resources such as Washington State Noxious Weed Control Board and Washington Invasive Species Council.
2. Every landscape has a population of some pest insects, weeds, and diseases. Once the pest has been identified and studied, determine if low levels of the pest are tolerable. Small numbers of certain pests may not be harmful. If this is the case, simply continue to monitor the pest population.
3. If pest exceed tolerance thresholds, choose a safe and effective control method.
    a. Cultural methods of vegetation and pest control are preferred and are first employed. Cultural control changes the pest's environment: landscape fabric, mulch, soil amendments, altering the irrigation method of duration, crop rotation, crop covers, etc.
    b. Mechanical means of vegetation and pest control are next in line of preference and are utilized where feasible. Mechanical means consist of digging, hand-pulling, mowing, tilling, trapping, etc.
    c. Biological methods of vegetation and pest control are considered before chemical means, where they are feasible. Biological control uses natural enemies: beneficial insects, managed grazing, bird boxes and perches, etc.
    d. Chemical methods are used only when no other feasible methods exist. Chemical control is the use of pesticides to remove vegetation and pests.
4. Observe and record the results of the control treatment. Evaluate the effectiveness. If necessary, modify maintenance practices to support a healthy landscape and prevent recurrence of the pest.

A licensed pesticide applicator is required for performing any chemical application in stormwater facilities. Applicators must be licensed in Washington State with an aquatic endorsement (WAC 16-228-1545). Applicator must submit a copy of their license to the City prior to starting work. Aquatic pesticide products are recommended. No chemical application shall be applied directly in the water. Do not apply pesticide when it is raining. Check the weather and ensure there are multiple dry days before and after application. Do not apply pesticide on windy days to prevent drift movement of pesticide from target areas.

For vegetated areas outside of stormwater facilities, Washington State pesticide application laws and rules are followed, Chapter 17.21 RCW and Chapter 16-228 WAC.

Plants and Groundcover

Use plants that will thrive in the growing conditions of each facility. Growing conditions are affected by moisture, soil conditions, and light. Plants native to western Washington are preferred. Recommended plants, seed mixes and groundcover list for biofiltration swales, bioretention systems, rain gardens, and other facility types are given in the respective BMP maintenance sections. It is best to reference the stormwater facility record drawings for vegetation replacements, if available. Fertilization of vegetated stormwater facilities should be avoided.

The City has adopted a list of approved plants for use in development projects, and to assist homeowners in choosing appropriate plantings. The list also has prohibited undesirable plants. Only plants approved for use on the City of Camas Plant Materials are allowed within the City's right-of-way.

Mulches and other ground coverings are useful during the installation and restoration of landscapes as well as their ongoing maintenance. Mulches meet a variety of needs. They suppress weeds, help to retain moisture around plants, reduce possible erosion and provide visual enhancement. Possible risk impacts to consider when using mulch are inadvertent introduction of non-native plants or migration of mulch material into waterways.

Possible scenarios where trees should be removed and/or trimmed in a stormwater facility (always check if the stormwater facility has a liner before tree removal):

- Trees that pose a risk to a stormwater structure due to root growth should be removed.
- Trees that are growing on spillways that would impede drainage should be removed.
- Hazardous trees should be removed.
- Trees/shrubs that hinder accessibility to access roads should be trimmed or removed.

References

Clark County. (July 2021). *Clark County Stormwater Manual 2015 Book 4 Stormwater Facility Operation and Maintenance*. https://clark.wa.gov/sites/default/files/media/document/2021-11/CCSM%20Book%204%20Maintenance%20and%20Operations.pdf

City of Battle Ground. (March 2019). *Stormwater Facility Maintenance Manual BG02.02*. https://www.cityofbg.org/DocumentCenter/View/2100/2019-Stormwater-Facility-Maintenance-Manual-Final?bidId=

Hinman, Curtis and Wulkan, Bruce. (December 2012). *Low Impact Development Technical Guidance Manual for Puget Sound*. https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMWW/Content/Resources/DocsForDownload/References/HinmanAndWulkan2012.pdf

Hinman, Curtis. (June 2013). *Rain Garden Handbook for Western Washington: A Guide for Design, Installation, and Maintenance*. https://apps.ecology.wa.gov/publications/publications/1310027.pdf

Washington Department of Ecology. (July 2019). *Stormwater Management Manual for Western Washington*. https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMWW/2019SWMMWW.htm#Topics/FrontCover.htm?TocPath=2019%2520SWMMWW%257C_____0

Washington State. *Noxious Weed Control Board*. https://www.nwcb.wa.gov/

Washington State Legislature. (1974). *Revised Code of Washington (RCW)*. https://apps.leg.wa.gov/RCW/default.aspx

Washington State Legislature. (2004). *Washington Administrative Code (WAC)*. https://app.leg.wa.gov/WAC/default.aspx

Washington State Recreation and Conservation Office. *Washington Invasive Species Council*. https://invasivespecies.wa.gov/

APPENDIX E

Stormwater Pollution Prevention Plan

Stormwater Pollution Prevention Plan

For
Reserve at Green Mountain

Prepared For
Pacific Lifestyle Home
11815 NE 99th Street
Vancouver, WA 98682

Owner	Developer	Operator/Contractor
Marwan Bahu	Pacific Lifestyle Home	Unknown
PO Box 744	11815 NE 99th Street	
San Clemente, CA 92672	Vancouver, WA 98682	

Project Site Location
2625 NE 28th Street
Camas, WA 98607
Parcel #173192000

SWPPP Prepared By
PLS Engineering, Inc.
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519

SWPPP Preparation Date
May 2025

Approximate Project Construction Dates
TBD

Exhibit 21 SUB25-1004

Contents

1.0 Introduction....5

2.0 Site Description....7

2.1 Existing Conditions....7
2.2 Proposed Construction Activities....7

3.0 Construction Stormwater BMPs....9

3.1 The 13 BMP Elements....9
3.1.1 Element #1 – Mark Clearing Limits....9
3.1.2 Element #2 – Establish Construction Access....9
3.1.3 Element #3 – Control Flow Rates....10
3.1.4 Element #4 – Install Sediment Controls....10
3.1.5 Element #5 – Stabilize Soils....11
3.1.6 Element #6 – Protect Slopes....12
3.1.7 Element #7 – Protect Drain Inlets....12
3.1.8 Element #8 – Stabilize Channels and Outlets....13
3.1.9 Element #9 – Control Pollutants....13
3.1.10 Element #10 – Control Dewatering....15
3.2 Site Specific BMPs....15
3.3 Additional Advanced BMPs....15

4.0 Construction Phasing and BMP Implementation....17

5.0 Pollution Prevention Team....19

5.1 Roles and Responsibilities....19
5.2 Team Members....19

6.0 Site Inspections and Monitoring....21

6.1 Site Inspection....21
6.1.1 Site Inspection Frequency....21
6.1.2 Site Inspection Documentation....21
6.2 Stormwater Quality Monitoring....22
6.2.1 Turbidity Sampling....22

7.0 Reporting and Recordkeeping....25

7.1 Recordkeeping....25
7.1.1 Site Log Book....25
7.1.2 Records Retention....25
7.1.3 Access to Plans and Records....25
7.1.4 Updating the SWPPP....25
7.2 Reporting....26
7.2.1 Discharge Monitoring Reports....26

Exhibit 21 SUB25-1004

7.2.2 Notification of Noncompliance 26
Appendix A – Site Plans.....27
Appendix B – Construction BMPs 29
Appendix C – Alternative BMPs.....31
Appendix D – General Permit 33
Appendix E – Site Inspection Forms (and Site Log).....35
Appendix F – Engineering Calculations.....44

Appendix A Site plans

- Vicinity map (with all discharge points)
- Site plan with TESC measures

Appendix B Construction BMPs

- Possibly reference in BMPs, but likely it will be a consolidated list so that the applicant can photocopy from the list from the SWMMWW.

Appendix C Alternative Construction BMP list

- List of BMPs not selected, but can be referenced if needed in each of the 12 elements

Appendix D General Permit

Appendix E Site Log and Inspection Forms

Appendix F Engineering Calculations

Exhibit 21 SUB25-1004

1.0 Introduction

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the Reserve at Green Mountain construction project in Camas, Washington. The site is located on Parcel 173192000. Current address for the site is 2625 NE Goodwin Rd, Camas, WA 98607 and the existing site is approximately 11.67 acres. Current proposed development associated with this SWPPP includes the construction of 37 single family lots and one existing house, along with the associated infrastructure. The stormwater plan associated with this project provides for stormwater management of all runoff from the site using a stormwater detention facility. Stormwater runoff from the pollution generating surfaces will be treated by a ConTech media cartridge before being stored and released.

Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of a detention pond to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV. The purpose of this SWPPP is to describe the proposed construction activities and all temporary and permanent erosion and sediment control (TESC) measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping that will be implemented during the proposed construction project. The objectives of the SWPPP are to:

1. Implement Best Management Practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. Prevent violations of surface water quality, ground water quality, or sediment management standards.

3. Prevent, during the construction phase, adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

This SWPPP was prepared using the Ecology SWPPP Template downloaded from the Ecology website. This SWPPP was prepared based on the requirements set forth in the Construction Stormwater General Permit and the *Stormwater Management Manual for Western Washington* (SWMMWW). The report is divided into seven main sections with several appendices that include stormwater related reference materials. The topics presented in the each of the main sections are:

- Section 1 – INTRODUCTION. This section provides a summary description of the project, and the organization of the SWPPP document.

Exhibit 21 SUB25-1004

- Section 2 – SITE DESCRIPTION. This section provides a detailed description of the existing site conditions, proposed construction activities, and calculated stormwater flow rates for existing conditions and post–construction conditions.

- Section 3 – CONSTRUCTION BMPs. This section provides a detailed description of the BMPs to be implemented based on the 12 required elements of the SWPPP (SWMMEW 2004).

- Section 4 – CONSTRUCTION PHASING AND BMP IMPLEMENTATION. This section provides a description of the timing of the BMP implementation in relation to the project schedule.

- Section 5 – POLLUTION PREVENTION TEAM. This section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the onsite temporary erosion and sedimentation control inspector

- Section 6 – INSPECTION AND MONITORING. This section provides a description of the inspection and monitoring requirements such as the parameters of concern to be monitored, sample locations, sample frequencies, and sampling methods for all stormwater discharge locations from the site.

- Section 7 – RECORDKEEPING. This section describes the requirements for documentation of the BMP implementation, site inspections, monitoring results, and changes to the implementation of certain BMPs due to site factors experienced during construction.

Supporting documentation and standard forms are provided in the following Appendices:

Appendix A – Site plans
Appendix B – Construction BMPs
Appendix C – Alternative Construction BMP list
Appendix D – General Permit
Appendix E – Site Log and Inspection Forms
Appendix F – Engineering Calculations

2.0 Site Description

2.1 Existing Conditions

Current Addresses for the site is 2625 NE Goodwin Rd, Camas, WA 98607. The site is approximately 11.67 acres. The property's topography is moderately sloped from a high point at the NE corner of the site to a low point at the SW corner of the site. The site has an existing house which will remain, and a garage and concrete building foundation which will be removed. The remaining area consists of grass, trees, and brush.

The soils are mapped by the NRCS as McBee silt loam (MlA) in the Northeast corner of the site, Dollar loam (DoB), in the north, Cove silty clay (CvA) on the West edge and Southwest section, and Lauren gravelly loam (LrC) in under the existing house and Southwest corner.

2.2 Proposed Construction Activities

The project proposes to develop the parcel into 38 single family lots and associated access. Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of an detention pond to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV.

Temporary erosion and sediment control facilities will be installed prior to site construction to handle construction-phase stormwater runoff. The schedule and phasing of BMPs during construction is provided in Section 4.0.

Stormwater runoff has been calculated using Western Washington Hydrology Model (WWHM). The detention pond was designed to store and release the runoff generated by the site. ConTech™ catch basins will be used to treat runoff before conveying it to the detention pond.

After the site has been graded and all new utilities are installed, the building construction will commence. Trees will also be planted in the landscape areas noted in the Landscape Plan. Temporary seeding will occur over the lots to establish vegetative cover until such time as individual buildings are developed and permanent landscaping occurs.

Exhibit 21 SUB25-1004

3.0 Construction Stormwater BMPs

3.1 The 13 BMP Elements

3.1.1 Element #1 – Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible. The BMPs relevant to marking the clearing limits that will be applied for this project include:

- Preserving Native Vegetation (BMP C101)
- Silt Fence (BMP C233)

Alternate BMPs for marking clearing limits are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.2 Element #2 – Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, and wheel washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled on site. The specific BMPs related to establishing construction access that will be used on this project include:

- Stabilized Construction Entrance (BMP C105)

Alternate construction access BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.3 Element #3 – Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site will be controlled. The specific BMP for flow control that shall be used on this project include:

- Detention Ponds (BMP D.1)

Alternate flow control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, the project must comply with Minimum Requirement 7 (Ecology 2005).

In general, discharge rates of stormwater from the site will be controlled where increases in impervious area or soil compaction during construction could lead to downstream erosion, or where necessary to meet local agency stormwater discharge requirements (e.g. discharge to combined sewer systems).

3.1.4 Element #4 – Install Sediment Controls

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site or prior to being discharged to an infiltration facility. The specific BMPs to be used for controlling sediment on this project include:

- Silt Fence (BMP C233)
- Storm Drain Inlet Protection (BMP C220)

Silt fencing and storm drain inlet protection will be adequate for sediment control during summer months. Alternate sediment control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

In addition, sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

Whenever possible, sediment laden water shall be discharged into onsite, relatively level, vegetated areas (BMP C240 paragraph 5, page 4-102).

Exhibit 21 SUB25-1004

In some cases, sediment discharge in concentrated runoff can be controlled using permanent stormwater BMPs (e.g., infiltration swales, ponds, trenches). Sediment loads can limit the effectiveness of some permanent stormwater BMPs, such as those used for infiltration or biofiltration; however, those BMPs designed to remove solids by settling (wet ponds or detention ponds) can be used during the construction phase. When permanent stormwater BMPs will be used to control sediment discharge during construction, the structure will be protected from excessive sedimentation with adequate erosion and sediment control BMPs. Any accumulated sediment shall be removed after construction is complete and the permanent stormwater BMP will be restabilized with vegetation per applicable design requirements once the remainder of the site has been stabilized.

The following BMPs will be implemented as end-of-pipe sediment controls as required to meet permitted turbidity limits in the site discharge(s). Prior to the implementation of these technologies, sediment sources and erosion control and soil stabilization BMP efforts will be maximized to reduce the need for end-of-pipe sedimentation controls.

- Construction Stormwater Filtration (BMP C251)
- Construction Stormwater Chemical Treatment (BMP C 250) (implemented only with prior written approval from Ecology).

3.1.5 Element #5 – Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for soil stabilization that shall be used on this project include:

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Nets and Blankets (BMP C122)
- Plastic Covering (BMP C123)
- Topsoiling (BMP C125)
- Surface Roughening (BMP C130)
- Dust Control (BMP C140)
- Early application of gravel base on areas to be paved

Alternate soil stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, no soils shall remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30) and 2 days during the wet season (October 1 to April 30). Regardless of the time of year, all soils

shall be stabilized at the end of the shift before a holiday or weekend if needed based on weather forecasts.

In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be temporarily covered with plastic sheeting. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

3.1.6 Element #6 – Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion. The following specific BMPs will be used to protect slopes for this project:

- Temporary and Permanent Seeding (BMP C120)

Alternate slope protection BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.7 Element #7 – Protect Drain Inlets

All storm drain inlets and culverts made operable during construction or inlets near the site that could potentially receive surface runoff from the construction site shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep street wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site. The following inlet protection measures will be applied on this project:

Drop Inlet Protection

- Block and Gravel Drop Inlet Protection
- Gravel and Wire Drop Inlet Protection
- Catch Basin Filter

If the BMP options listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D), or if no BMPs are listed above but deemed necessary during construction, the Certified Erosion and Sediment Control Lead shall implement one or more of the alternative BMP inlet protection options listed in Appendix C.

3.1.8 Element #8 – Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels or discharged to a stream or some other natural drainage point, efforts will be taken to prevent downstream erosion. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

- Outlet Protection (BMP C209)

Alternate channel and outlet stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, all temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour recurrence interval storm for the developed condition. Alternatively, the 10-year, 1-hour peak flow rate indicated by an approved continuous runoff simulation model, increased by a factor of 1.6, shall be used. Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems.

3.1.9 Element #9 – Control Pollutants

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Chemical storage:

- Any chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume IV of the Ecology stormwater manual. In Western WA, all chemicals shall have cover, containment, and protection provided on site, per BMPC153 for Material Delivery, Storage and Containment in SWMMWW 2005
- Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

Excavation and tunneling spoils dewatering waste:

- Dewatering BMPs and BMPs specific to the excavation and tunneling (including handling of contaminated soils) are discussed under Element 10.

Demolition:

- Dust released from demolished sidewalks, buildings, or structures will be controlled using Dust Control measures (BMP C140).
- Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).
- Process water and slurry resulting from sawcutting and surfacing operations will be prevented from entering the waters of the State by implementing Sawcutting and Surfacing Pollution Prevention measures (BMP C152).

Concrete and grout:

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151).

Sanitary wastewater:

- Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.
- Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system or to the sanitary sewer as part of Wheel Wash implementation (BMP C106).

Solid Waste:

- Solid waste will be stored in secure, clearly marked containers.

Other:

- Other BMPs will be administered as necessary to address any additional pollutant sources on site.

The facility does not require a Spill Prevention, Control, and Countermeasure (SPCC) Plan under the Federal regulations of the Clean Water Act (CWA).

3.1.10 Element #10 – Control Dewatering

3.1.13 Element #13 – Protect Low Impact Development BMPs

- Protect all bioretention and rain garden BMP's from sedimentation through installation and maintenance of erosion control BMP's on portions of the site that drain into them. Restore the BMP's to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden bioretention/ rain garden soils, and replacing the removed soils with soils meeting the design specification.
- Prevent compacting bioretention and rain garden BMP's by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction by construction equipment.
- Control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff into permeable pavements or base materials.
- Pavements fouled with sediments or no longer passing an initial infiltration test must be cleaned using procedures from Book 4 of the manufacturer's procedures.
- Keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils

3.2 Site Specific BMPs

Site specific BMPs are shown on the TESC Plan Sheets and Details in Appendix A. These site-specific plan sheets will be updated annually.

3.3 Additional Advanced BMPs

- The following BMPs are advanced and are only recommended if construction activities are complex enough to warrant them; or if the site has the potential for significant impacts to water quality. The following BMPs are directed at "end-of-pipe" treatment for sedimentation issues related to turbid runoff from construction sites. Effective BMPs are most often the simple BMPs and focus on the minimization of erosion before sedimentation is an issue. The following BMPs will most likely be implemented only after other BMP options are exhausted, or if the construction activity is large and off-site sedimentation or turbid runoff occurs or is inevitable.
- For BMP 250, written pre-approval, through Ecology is required (see SWMMWW 2005):
- BMP C250: Construction Stormwater Chemical Treatment
- BMP C251: Construction Stormwater Filtration.

4.0 Construction Phasing and BMP Implementation

The BMP implementation schedule will be driven by the construction schedule. The following provides a sequential list of the proposed construction schedule milestones and the corresponding BMP implementation schedule. The list contains key milestones such as wet season construction.

The BMP implementation schedule listed below is keyed to proposed phases of the construction project and reflects differences in BMP installations and inspections that relate to wet season construction. The project site is located west of the Cascade Mountain Crest. As such, the dry season is considered to be from May 1 to September 30 and the wet season is considered to be from October 1 to April 30.

- Estimate of Construction start date: TBD
- Estimate of Construction finish date: TBD
- Mobilize equipment on site: TBD
- Mobilize and store all ESC and soil stabilization products: TBD
- Install ESC measures: TBD
- Install stabilized construction entrance: TBD
- Begin clearing and grubbing: TBD
- Demolish existing structures: TBD
- Begin site grading TBD
- Site grading ends TBD
- Excavate and install new utilities and services: TBD
  Excavation for building foundations TBD
- Begin building construction: TBD
  Complete utility construction TBD
- Begin implementing soil stabilization and sediment control BMPs throughout the site in preparation for wet season: TBD
- Wet Season starts: 11/01/25
- Site inspections and monitoring conducted weekly and for applicable rain events as detailed in Section 6 of this SWPPP: TBD
- Implement Element #12 BMPs and manage site to minimize soil disturbance during the wet season: TBD
- Complete road paving TBD
- Building construction complete: TBD
- Dry Season starts: 5/01/26

Exhibit 21 SUB25-1004

5.0 Pollution Prevention Team

5.1 Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- Certified Erosion and Sediment Control Lead (CESCL) – primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, etc.); to be called upon in case of failure of any ESC measures.
- Resident Engineer – For projects with engineered structures only (sediment ponds/traps, sand filters, etc.): site representative for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative
- Emergency Ecology Contact – individual to be contacted at Ecology in case of emergency.
- Emergency Owner Contact – individual that is the site owner or representative of the site owner to be contacted in the case of an emergency.
- Non-Emergency Ecology Contact – individual that is the site owner or representative of the site owner than can be contacted if required.
- Monitoring Personnel – personnel responsible for conducting water quality monitoring; for most sites this person is also the Certified Erosion and Sediment Control Lead.

5.2 Team Members

Names and contact information for those identified as members of the pollution prevention team are provided in the following table.

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	Unknown	
Resident Engineer	Travis Johnson	(360)944-6519
Emergency Ecology Contact	Unknown	
Emergency Owner Contact	Unknown	
Non-Emergency Ecology Contact	Unknown	
Monitoring Personnel	Unknown	

Exhibit 21 SUB25-1004

6.0 Site Inspections and Monitoring

Monitoring includes visual inspection, monitoring for water quality parameters of concern, and documentation of the inspection and monitoring findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book. This SWPPP may function as the site log book if desired, or the forms may be separated and included in a separate site log book. However, if separated, the site log book but must be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.1 Site Inspection

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. The inspector will be a Certified Erosion and Sediment Control Lead (CESCL) per BMP C160. The name and contact information for the CESCL is provided in Section 5 of this SWPPP.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. The site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the site log book or forms provided in this document. All new BMPs or design changes will be documented in the SWPPP as soon as possible.

6.1.1 Site Inspection Frequency

Site inspections will be conducted at least once a week and within 24 hours following any discharge from the site. For sites with temporary stabilization measures, the site inspection frequency can be reduced to once every month.

6.1.2 Site Inspection Documentation

The site inspector will record each site inspection using the site log inspection forms provided in Appendix E. The site inspection log forms may be separated from this SWPPP document, but will be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Exhibit 21 SUB25-1004

6.2 Stormwater Quality Monitoring

The construction site will comply with the requirements set forth in the 2015 Construction Stormwater General Permit (revised 2017) seen in Appendix D. A Certified Erosion and Sediment Control Lead shall be on-site or on-call at all times.

The following text describes the monitoring for the proposed development.

6.2.1 Turbidity Sampling

The receiving water body, Lacamas Creek Watershed, is impaired for turbidity. Mandatory BMPs (Best Management Practices) and erosion control practices put in place by the permit will appropriately minimize the turbidity of the stormwater discharge. Monitoring requirements for the proposed project will include weekly turbidity sampling to monitor site discharges for water quality compliance as required by the NPDES Construction Stormwater General Permit, provided that site discharges occur. It should be noted that the site is designed such that all site runoff will be infiltrated so it is likely that discharges will be rare or may not occur at all. Sampling will be conducted at all discharge points at least once per calendar week.

Turbidity sampling during construction will be completed weekly in order to confirm that erosion control measures are meeting the water quality standards for turbidity (Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharge, but has not excluded these discharges, compliance with special Conditions S4 (monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL (S8.E.1.c)). Special Conditions S4 establishes that the key benchmark values that require action are 25 NTU for turbidity (equivalent to 32 cm transparency) and 250 NTU for turbidity (equivalent to 6 cm transparency). If the 25 NTU benchmark for turbidity (equivalent to 32 cm transparency) is exceeded, the following steps will be conducted:

1. Ensure all BMPs specified in this SWPPP are installed and functioning as intended.
2. Assess whether additional BMPs should be implemented, and document revisions to the SWPPP as necessary.
3. Sample discharge location daily until the analysis results are less than 25 NTU (turbidity) or greater than 32 cm (transparency).

If the turbidity is greater than 25 NTU (or transparency is less than 32 cm) but less than 250 NTU (transparency greater than 6 cm) for more than 3 days, additional treatment BMPs will be implemented within 24 hours of the third consecutive sample that exceeded the benchmark value. Additional treatment BMPs to be considered will include, but are not limited to, off-site treatment, infiltration, filtration and chemical treatment.

If the 250 NTU benchmark for turbidity (or less than 6 cm transparency) is exceeded at any time, the following steps will be conducted:

1. Notify Ecology by phone within 24 hours of analysis (see Section 5.0 of this SWPPP for contact information).
2. Continue daily sampling until the turbidity is less than 25 NTU (or transparency is greater than 32 cm).

Exhibit 21 SUB25-1004

3. Initiate additional treatment BMPs such as off-site treatment, infiltration, filtration and chemical treatment within 24 hours of the first 250 NTU exceedance.
4. Implement additional treatment BMPs as soon as possible, but within 7 days of the first 250 NTU exceedance.
5. Describe inspection results and remedial actions taken in the site log book and in monthly discharge monitoring reports as described in Section 7.0 of this SWPPP.

In the event that Turbidity results are greater than 25 NTUs, or the site is determined to be out of compliance with surface water quality standards for turbidity, the following BMPs should be established, re-established or implemented as determined necessary by the Certified Erosion and Sediment Control lead (CESCL) in order to bring the site back into compliance:

BMP C105: Stabilized Construction Entrance / Exit (repair construction entrance as necessary)

BMP C106: Wheel Wash (repair wheel wash as necessary)

BMP C120: Temporary and permanent Seeding

BMP C124: Sodding

BMP C140: Dust Control

BMP C209: Outlet Protection

BMP C220: Storm Drain Inlet Protection (add more inlet protection, as necessary

BMP C233: Silt Fence (add more silt fencing as necessary)

Exhibit 21 SUB25-1004

7.0 Reporting and Recordkeeping

7.1 Recordkeeping

7.1.1 Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book.

7.1.2 Records Retention

Records of all monitoring information (site log book, inspection reports/checklists, etc.), this Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements will be retained during the life of the construction project and for a minimum of three years following the termination of permit coverage in accordance with permit condition S5.C.

7.1.3 Access to Plans and Records

The SWPPP, General Permit, Notice of Authorization letter, and Site Log Book will be retained on site or within reasonable access to the site and will be made immediately available upon request to Ecology or the local jurisdiction. A copy of this SWPPP will be provided to Ecology within 14 days of receipt of a written request for the SWPPP from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with permit condition S5.G.

7.1.4 Updating the SWPPP

In accordance with Conditions S3, S4.B, and S9.B.3 of the General Permit, this SWPPP will be modified if the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site or there has been a change in design, construction, operation, or maintenance at the site that has a significant effect on the discharge, or potential for discharge, of pollutants to the waters of the State. The SWPPP will be modified within seven days of determination based on inspection(s) that additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared.

Exhibit 21 SUB25-1004

7.2 Reporting

7.2.1 Discharge Monitoring Reports

Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period, the Permittee shall submit the form as required, with the words "No discharge" entered in the place of monitoring results. The DMR due date is 15 days following the end of each month.

Water quality sampling results will be submitted to Ecology monthly on Discharge Monitoring Report (DMR) forms in accordance with permit condition S5.B. If there was no discharge during a given monitoring period, the form will be submitted with the words "no discharge" entered in place of the monitoring results. If a benchmark was exceeded, a brief summary of inspection results and remedial actions taken will be included. If sampling could not be performed during a monitoring period, a DMR will be submitted with an explanation of why sampling could not be performed.

7.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit are not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with permit section S5.F:

1. Ecology will be immediately notified of the failure to comply.
2. Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Any time turbidity sampling indicates turbidity is 250 nephelometric turbidity units (NTU) or greater or water transparency is 6 centimeters or less, the Ecology regional office will be notified by phone within 24 hours of analysis as required by permit condition S5.A (see Section 5.0 of this SWPPP for contact information).

In accordance with permit condition S2.A, a complete application form will be submitted to Ecology and the appropriate local jurisdiction (if applicable) to be covered by the General Permit.

Appendix A – Site Plans

Exhibit 21 SUB25-1004

Appendix B – Construction BMPs

Stabilized Construction Entrance (BMP C105)

Silt Fence (BMP C233)

Storm Drain Inlet Protection (BMP C220)

Detention Pond (BMP D.1)

Temporary and Permanent Seeding (BMP C120)

Mulching (BMP C121)

Nets and Blankets (BMP C122)

Plastic Covering (BMP C123)

Topsoiling (BMP C125)

Dust Control (BMP C140)

Early application of gravel base on areas to be paved

Outlet Protection (BMP C209)

Exhibit 21 SUB25-1004

Appendix C – Alternative BMPs

The following includes a list of possible alternative BMPs for each of the 12 elements not described in the main SWPPP text. This list can be referenced in the event a BMP for a specific element is not functioning as designed and an alternative BMP needs to be implemented.

Element #1 - Mark Clearing Limits
High Visibility Plastic or Metal Fence (BMP C103)
Stake and Wire Fence (BMP C104)
Element #2 - Establish Construction Access
Wheel Wash (BMP C106)
Water Bars (BMP C203)
Element #3 - Control Flow Rates
Wattles (BMP C235)

Element #4 - Install Sediment Controls
Straw Bale Barrier (BMP C230)
Gravel Filter Berm (BMP C232)
Straw Wattles (BMP C235)
Portable Water Storage Tanks (Baker Tanks)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #5 - Stabilize Soils
Polyacrylamide (BMP C126)

Element #6 - Protect Slopes
Straw Wattles (BMP C235)
Surface Roughening (BMP C240)

Element #8 - Stabilize Channels and Outlets
Level Spreader (BMP C206)
Check Dams (BMP C207)

Element #9 – Control Pollutants
Concrete Handling (BMP C151)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #10 - Control Dewatering
Vegetated Filtration (BMP C236)
Additional Advanced BMPs to Control Dewatering:

Appendix D – General Permit

Exhibit 21 SUB25-1004

Appendix E – Site Inspection Forms (and Site Log)

The results of each inspection shall be summarized in an inspection report or checklist that is entered into or attached to the site log book. It is suggested that the inspection report or checklist be included in this appendix to keep monitoring and inspection information in one document, but this is optional. However, it is mandatory that this SWPPP and the site inspection forms be kept onsite at all times during construction, and that inspections be performed and documented as outlined below.

At a minimum, each inspection report or checklist shall include:

a. Inspection date/times

b. Weather information: general conditions during inspection, approximate amount of precipitation since the last inspection, and approximate amount of precipitation within the last 24 hours.

c. A summary or list of all BMPs that have been implemented, including observations of all erosion/sediment control structures or practices.

d. The following shall be noted:

   i. locations of BMPs inspected,

   ii. locations of BMPs that need maintenance,

   iii. the reason maintenance is needed,

   iv. locations of BMPs that failed to operate as designed or intended, and

   v. locations where additional or different BMPs are needed, and the reason(s) why

e. A description of stormwater discharged from the site. The presence of suspended sediment, turbid water, discoloration, and/or oil sheen shall be noted, as applicable.

f. A description of any water quality monitoring performed during inspection, and the results of that monitoring.

g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.

h. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the SWPPP and the NPDES permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation.

Exhibit 21 SUB25-1004

i. Name, title, and signature of person conducting the site inspection; and the following statement: "I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief".

When the site inspection indicates that the site is not in compliance with any terms and conditions of the NPDES permit, the Permittee shall take immediate action(s) to: stop, contain, and clean up the unauthorized discharges, or otherwise stop the noncompliance; correct the problem(s); implement appropriate Best Management Practices (BMPs), and/or conduct maintenance of existing BMPs; and achieve compliance with all applicable standards and permit conditions. In addition, if the noncompliance causes a threat to human health or the environment, the Permittee shall comply with the Noncompliance Notification requirements in Special Condition S5.F of the permit.

Site Inspection Form

General Information			
Project Name:			
Inspector Name:		**Title:** **CESCL # :**	
Date:		**Time:**	
Inspection Type:	□ After a rain event □ Weekly □ Turbidity/transparency benchmark exceedance □ Other		
Weather			
Precipitation	Since last inspection	In last 24 hours	
Description of General Site Conditions:			

Inspection of BMPs

Element 1: Mark Clearing Limits

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 2: Establish Construction Access

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 3: Control Flow Rates

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 4: Install Sediment Controls

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

BMP:

Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Element 5: Stabilize Soils

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 6: Protect Slopes

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 7: Protect Drain Inlets

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 8: Stabilize Channels and Outlets

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 9: Control Pollutants						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
Element 10: Control Dewatering						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Stormwater Discharges From the Site		
	Observed?	Problem/Corrective Action

	Y	N
Location		
Turbidity		
Discoloration		
Sheen		
Location		
Turbidity		
Discoloration		
Sheen		

Water Quality Monitoring
Was any water quality monitoring conducted? □ Yes □ No
If water quality monitoring was conducted, record results here:
If water quality monitoring indicated turbidity 250 NTU or greater; or transparency 6 cm or less, was Ecology notified by phone within 24 hrs? □ Yes □ No
If Ecology was notified, indicate the date, time, contact name and phone number below:
Date:
Time:
Contact Name:
Phone #:
General Comments and Notes
Include BMP repairs, maintenance, or installations made as a result of the inspection.
Were Photos Taken? □ Yes □ No
If photos taken, describe photos below:

Appendix F – Engineering Calculations

Engineering calculations provided in Appendix B of the Technical Information Report

APPENDIX F

Environmental Documentation

CRITICAL AREAS REPORT & BUFFER MITIGATION PLAN

Project:

The Reserve at Green Mountain

Applicant:

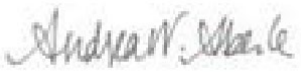
Pacific Lifestyle Homes
11815 NE 99th Street,
Vancouver WA, 98682

Prepared By:

Ash ECO SOLUTIONS, LLC

May 1 , 2025

The information in this report was compiled to meet the requirements of the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. This report has been prepared under the supervision and direction of the undersigned, a qualified professional following CMC Section 16.61.020.A.



Andrea W. Aberle, Sr. Biologist
AshEco Solutions, LLC

SITE INFORMATION:

Parcel No(s):	173192000
Acreage:	11.67 acres
Local Jurisdiction:	City of Camas, Washington
Section/Township/Range:	SW¼, S21, T2N, R3E, W.M.
Site Address:	2625 Goodwin Road Camas, WA 98607
Legal Landowner:	Marwan Bahu

TABLE OF CONTENTS

INTRODUCTION **10**
Project Description **10**
Project Location and Background Information **10**
EXISTING CONDITIONS **10**
CRITICAL AREAS MAP RESEARCH **10**
Topography **10**
Soil Survey **10**
Wetlands **11**
Riparian Habitat **12**
Shorelines **12**
WDFW Priority Habitat **12**
METHODOLOGY **12**
Wetlands **12**
Riparian Habitat **13**
WDFW Priority Habitat **13**
Habitats of Local Importance **13**
DOCUMENTED VEGETATION **14**
CRITICAL AREA CONCLUSIONS **14**
Wetlands **14**
Wetland Buffer **14**
BUFFER MITIGATION PLAN **15**
Avoidance and Minimization **15**
PLANTING PLAN **18**
Site Preparation **18**
Plant Materials **19**
Container Stock **19**
Bareroot Species **19**
Planting Methods **19**
Planting Specifications **19**
Maintenance Plan **21**
Monitoring Plan **21**
Monitoring Report Contents **22**

Contingency Plan **22**
Site Protection **22**
MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS **22**
CONCLUSIONS **24**
DISCLAIMER **24**
REFERENCES **25**

TABLES

Table 1. Critical Areas Summary 15
Table 2. Impacts & Mitigation Summary 18
Table 3. Native Planting Plan 20
Table 4. Performance Standards by Monitoring Year 23

FIGURE SET

Figure 1 – Vicinity Map
Figure 2 – Aerial & Topography Map
Figure 3 – Soil Survey & National Wetlands Inventory (NWI) Map
Figure 4 – Riparian Habitat & Species Map
Figure 5 – Shorelines Map
Figure 6 – Priority Habitat & Species Map
Figure 7 – Forest Practices Application Review System (FPARS) Map
Figure 8 – Existing Conditions Map
Figure 9 – Proposed Site Plan
Figure 10 – Tree Plan

APPENDICES

Appendix A – Site Photos
Appendix B – Wetland Determination Datasheets
Appendix C – Wetland Rating Form & Figures
Appendix D – Tree Survey & Table

INTRODUCTION

Project Description

AshEco Solutions, LLC (AES) was contracted by Pacific Lifestyle Homes (PLH) to assess the potential critical areas present within the subject parcel that comprises the proposed subdivision site and develop a mitigation plan to offset project impacts. This Critical Areas Report and Buffer Plan follows the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. PLH proposes construction of 38-lot single family residence subdivision within a parcel of land comprised of 11.67-acres.

Project Location and Background Information

The subject parcel addressed as 2625 Goodwin Road, Camas, Washington (Figure 1), is under the jurisdiction of the City of Camas and is assigned Parcel Number 173192000. The site is surrounded to the east and west by large residential and agricultural lots. North of the property is urban residential lots and south of the property is forest park land owned by Clark County.

EXISTING CONDITIONS

A single-family residence is located within the southern section of the subject parcel. A large accessory building/shop, and another smaller accessory building adjacent to the larger building, are present within the northern section of the property. The residence is accessed from NE Goodwin Road from a paved and gated driveway. Topography, onsite and in the vicinity of the site, consistently falls in elevation from NE Goodwin Road in the north to the south/southwest offsite. Seasonal hydrology ultimately flows southwest to the valley floor where Lacamas Creek is located offsite. A constructed pond is located in the southwest parcel corner inside the wetland boundary onsite. Scattered individual trees, and groups of trees, including Oregon white oak are present throughout the subject parcel. However, otherwise the parcel is generally open, with the northern section historically used for equine and agricultural purposes and the south reserved for the existing residence and expansive lawn area that surrounds it. Little native understory exists within the bulk of the parcel due to a history of grazing of the open pastures and maintained lawn present surrounding the residence. Forested habitat becomes predominant near the southern parcel boundary as the subject parcel abuts Clark County owned lands located directly south of the subject site. It should be noted that a series of trails and a maintained access/logging road is present to the south on the county property with connection ultimately south to Lacamas Lake and Camp Currie park lands.

CRITICAL AREAS MAP RESEARCH

Topography

Topography generally consists of a south facing slope on a terrace above the Lacamas Creek valley. Topography maps show that the overall area drops in elevation from Goodwin Road to the south (Figure 2).

Soil Survey

Soils within the subject parcel are mapped by the NRCS USDA Soil Conservation Service, Soil Survey of Clark County Washington (1972), as Lauren gravelly loam, cemented substratum, 3 to 15 percent slopes (LrC), Cove silty loam, 0 to 3 percent slopes (CvA), and Dollar loam, 0 to 5 percent slopes (DoB) (Figure 3).

The Lauren series consists of deep, somewhat excessively drained, nearly level to gently sloping soils on terraces 50 to 300 feet above the Columbia River. In a few places, on terrace fronts, the soils are steep to very steep. These are very gravelly soils that formed in mixed Columbia River alluvium that contained some volcanic ash. Lauren soils are in the southwestern part of the county, in the vicinity of Mill Plain, Orchards, and Fourth Plain. The original vegetation was Douglas-fir, grand fir, bigleaf maple, vine maple, salal, and ferns. The average annual precipitation is about 48-inches.

Lauren loam, cemented substratum, 3 to 15 percent slopes (LrC) is similar to Lauren gravelly loam, 0 to percent slopes, except that the cementation in this soil is outside the defined range for this soil series. In a typical profile the surface layer is about 14 inches thick. It is very dark brown gravelly loam in the upper part, and very dark brown grayish-brown gravelly clay loam in the lower part. Below the surface layer is firm, dark brown very gravelly clay loam about 21 inches thick. The next layer, to a depth of 60 inches, is dark yellowish-brown very gravelly clay loam. It is weakly cemented. This soil is moderately well drained, surface runoff is slow to medium and the erosion hazard is slight to moderate. Native Oregon white oak and Oregon ash are the predominate with native trees present within this soil series, with Douglas fir predominate in the better drained areas. The Lauren loam 3 to 15 percent slopes is not listed as a hydric soil by the Washington State Hydric Soils List for Clark County (NRCS 2022).

The Cove series consists of deep, very poorly drained, mostly nearly level soils. These soils formed in water-laid deposits in old lakes and ponds and have a clayey subsoil. Typical native vegetation is deciduous trees, sedges, reeds, and water-tolerant shrubs and grasses. Cove

Cove silty loam, 0 to 3 percent slopes (CvA), is found in concave drainageways and in large, flat, old lakebeds. The slope is generally less than 1 percent. In a typical profile the surface layer is very dark graysilty clay about 4 inches thick. Below this is firm clay about 32 inches thick. It is black in the upper part and very dark gray and mottled in the lower part. The underlying material, to a depth of 54 inches, is mottled, light olive-gray gravelly silty clay loam. This soil is very poorly drained and very slowly permeableSurface runoff is very slow, and ponding is common in winter unless drainage is provided. There is no hazard of erosion. The CvA 0 to 3 percent slopes soil type is listed on the Washington State Hydric Soils List for Clark County (NRCS 2022). AES does not agree with the hydric soils mapping over the subject site entirely, but wetlands were identified near the western parcel boundary and the southwest corner of the subject site (Figures 3 and 8).

The Dollar series consists of deep, moderately well drained, nearly level to gently sloping soils. These are medium textured soils that developed in deposits of old Columbia River alluvium. They are on low terraces that adjoin the poorly drained, depressional McBee, coarse variant, soils and the Cove soils. Typical native vegetation is mainly Douglas-fir, grand fir, and some western redcedar, and an understory comprised of salal, Oregon grape, vine maple, and ferns. In areas of transitional to wet soils, the vegetation is red alder and Oregon ash.

Dollar loam, 0 to 5 percent slopes (DoB) can be identified easily by its slightly raised relief with scattered stands of Douglas-fir. In a typical profile the surface layer is dark-brown loam about 6 inches thick. Below this is friable heavy loam about 26 inches thick. It is dark reddish brown in the upper part and dark brown in the lower part. The next layer, to a depth of 60 inches, is very firm and brittle, dark yellowish-brown heavy loam. This soil is moderately well drained. Surface runoff is slow, and the erosion hazard is slight. The DoB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Mapped hydric soils do not necessarily mean that the area is a wetland; hydrology and wetland vegetation must be present to classify an area as a wetland. The same is true for soils that are not mapped as hydric. Wetlands can be found in areas without mapped hydric soils.

Wetlands

Potential wetland presence is mapped within the southwest corner of the parcel by the Clark County GIS MapsOnline (Figure 3). The National Wetland Inventory (NWI) also maps wetlands within the same general area

(Figure 3). Wetlands were identified within the subject parcel by AshEco Solutions (AES) near the western property line and far southwest portion of the site (Figure 8). An additional offsite wetland was also mapped just offsite from the southeastern property corner, Figure 8.

Riparian Habitat
Clark County GIS does not map Riparian Habitat onsite (Figure 4). Within the southeast corner of the subject parcel AES identified an unnamed seasonal, non-fish bearing (Type Ns) stream (Figures 8 and 9). The stream is not mapped by the WA State Department of Natural Resources (DNR) Forest Practices Application Review System (FPARS) (Figure 7).

Shorelines
An offsite Type S Water (Lacamas Creek) is located approximately 0.25 miles southwest of the subject parcel. Type S Waters are considered Shorelines of the State and governed by the City of Camas and Washington State Department of Ecology (ECY). The "Urban Conservancy" shoreline designation is mapped by the Clark County GIS shoreline layer as intruding into the southwest parcel corner, which roughly corresponds with the location of the onsite portion of Wetland A (Figure 5 and Figures 8-9). Wetland A is therefore considered to be an "associated wetland" to the shoreline and governed by the local SMP. The project does not propose direct impacts to this associated wetland to the shoreline and has applied the standard wetland buffer widths as required by the local code.

WDFW Priority Habitat
The Washington Department of Fish and Wildlife (WDFW) maps Oregon white oak habitat within the southeast corner of the subject parcel, Figure 4. AES identified Oregon white oak habitat onsite, both within the southeast corner as well as the central portion of the site. AES also mapped individual oaks onsite in areas not previously mapped by WDFW, Figure 8.

WDFW also indicates that "Cave or Cave-rich Areas" occur within the general area surrounding the subject parcel, though no evidence of caves or rock outcroppings were identified onsite by AES during site reconnaissance.

No riparian habitat was mapped by WDFW, DNR or Clark County GIS within the subject parcel however AES did identify a short section of seasonal stream that contained a well-defined stream channel. It appears this channel conveys seasonal hydrology between the two wetlands mapped by AES during storm events, Figure 8.

METHODOLOGY

Wetlands
The study area and immediate offsite vicinity was evaluated for the presence of wetlands using the Routine Determination Method per the U.S. Army Corps of Engineers' (USACE's) *Wetland Delineation Manual* (1987), the *Washington State Wetlands Identification and Delineation Manual* (1997), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, Version 2.0* (USACE 2010). The Routine Determination Method examines three parameters to determine if wetlands exist in a given area: vegetation, hydrology, and soils. The presence of hydrology is critical in identifying wetlands; however, since hydrologic conditions can change periodically (hourly, daily, or seasonally), it is necessary to determine if hydrophytic vegetation and hydric soils are also present. By definition, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of

vegetation typically adapted for life in saturated soil conditions. Wetlands are regulated as "Waters of the United States" by the USACE, "Waters of the State" by Washington State Department of Ecology (ECY), and locally by CMC section 16.53 Wetlands. Wetlands were identified by AES in the southwest corner of the subject parcel (extending offsite to the west), and just offsite from the southeast corner of the subject parcel, Figure 8.See Appendix B for formal test plot data collected onsite by AES. See Appendix A for representative site photos.

Riparian Habitat

The methodology used for determining the location of the OHWM of the unnamed seasonal, non-fish bearing (Type Ns) stream followed the Washington State Department of Ecology's (ECY) Determining the OHWM on Streams in Washington State (2010). See Appendix A for representative site photos.

WDFW Priority Habitat

The subject site was evaluated for the presence of Priority Habitats as defined by WDFW Priority Habitats and Species (PHS) List 2008. WDFW PHS system maps Oregon white oak habitat onsite and adjacent to the subject parcel and the PHS system indicates that "Cave or Cave-rich Areas" occur in areas surrounding the subject parcel (Figure 6).

WDFW defines Caves as, *"A naturally occurring cavity, recess, void, or system of interconnected passages (including associated dendritic tubes, cracks, and fissures) which occurs under the earth in soils, rock, ice, or other geological formations, and is large enough to contain a human. Mine shafts (a human-made excavation in the earth usually used to extract minerals) may mimic caves and abandoned mine shafts with actual or suspected occurrences of priority species should be treated in a manner similar to caves."*

WDFW defines Oregon White Oak Woodlands as, "*stands of oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%; or where total canopy coverage of the stand is <25%, but oak accounts for at least 50% of the canopy coverage. The latter is often referred to as oak savanna. In non-urbanized areas west of the Cascades, priority oak habitat consists of stands > 0.4 ha (1.0 ac) in size. East of the Cascades, priority oak habitat consists of stands > 2 ha (5 ac) in size. In urban or urbanizing areas, single oaks or stands < 0.4 ha (1 ac) may also be considered a priority when found to be particularly valuable to fish and wildlife (i.e., they contain many cavities, have a large diameter at breast height [dbh]* (generally 20-inches dbh and greater)*, are used by priority species, or have a large canopy). Oak woodlands in western Washington may contain understory plants indicative of Prairie*."

No caves were identified onsite or immediately offsite near the subject parcel. Oregon white oak habitat consisting of individual oak trees were identified within or immediately adjacent to the subject parcel (Figure 8). The subject site is within an incorporated city and is urban, therefore the individual Oregon white oak trees are considered Priority Habitat by WDFW. There are areas onsite where the oak trees are more densely populated and/or located within areas of shared Douglas-fir canopy, but these areas do not meet the above definition for oak woodland or savanna. The outer dripline of the canopy for the individual oak trees measuring 20-inches dbh or greater onsite were therefore mapped and professionally surveyed by PLS Engineering, Figures 8-10 and Appendix D. See Appendix A for representative site photos. The project does not propose impacts to the onsite oak habitat. The wetland buffer mitigation plan includes the restoration and enhancement of the onsite oak habitat, Figure 9

Habitats of Local Importance

Following CMC Chapter 16.61 - Fish And Wildlife Habitat Conservation Areas, Section: 16.61.010.A.3.a,

individual Oregon white oak trees with a twenty-inch diameter at breast height (20-inches dbh), stands of Oregon white oak trees greater than one acre when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height, are used by priority species, or have a large canopy), and all Oregon white oak snags unless determined by an arborist to be a hazard, are considered Habitats of Local Importance and therefore are regulated by CMC. The tree survey identified approximately sixteen (16) jurisdictional Oregon white oak trees onsite that had greater than 20-inch dbh measurements, See Appendix D.

DOCUMENTED VEGETATION

The vegetation onsite has been disturbed by equestrian use and historic mowing activities, with non-native and invasive grasses and herbs dominate throughout areas historically grazed within the northern and central sections of the parcel. Scattered trees present within the onsite central section include Douglas-fir (*Pseudotsuga menzisii* FACU) and Oregon white oak (*Quercus garryana* FACU).

South of the subject parcel is a forested wetland mosaic area owned by Clark County. This area is much more biologically diverse and slightly overlaps with onsite areas along the southern parcel boundary and corners. Vegetation identified in this area includes Douglas-fir (*Pseudotsuga menzisii* FACU), Oregon white oak (*Quercus garryana* FACU), and Oregon ash (*Fraxinus latifolia* FACW) in the overstory with vine maple (*Acer circinatum* FAC), beaked hazelnut (*Corylus cornuta* FACU), snowberry (*Symphoricarpos albus* FACU), red osier dogwood (*Cornus sericea* FACW), trailing blackberry (*Rubus ursinus* FACU) and salmonberry (*Rubus spectabilis* FAC) in the shrub stratum and sword fern (*Polystichum munitum* FACU), piggy-back plant (*Tolmiea menzisii* FAC), lanceleaf spring beauty (*Claytonia lanceolata* FAC), dovefoot geranium (*Geranium mole* FACU), large leaf avens (*Geum macrophyllum* FACW), and slough sedge (*Carex obnupta* OBL) in the herbaceous stratum.

The indicator categories following the common and scientific name of each vegetation species indicate the likelihood of the species to be found in wetlands. Listed from most-likely to least-likely to be found in wetlands, the indicator categories are:

- **OBL (obligate wetland) –** Occur almost always under natural conditions in wetlands.
- **FACW (facultative wetland) –** Usually occur in wetlands but occasionally found in non-wetlands.
- **FAC (facultative) –** Equally likely to occur in wetlands or non-wetlands.
- **FACU (facultative upland) –** Usually occur in non-wetlands but occasionally found in wetlands.
- **UPL (obligate upland) –** Occur almost always under natural conditions in non-wetlands.
- **NI (no indicator) –** Insufficient data to assign to an indicator category.

CRITICAL AREA CONCLUSIONS

Wetlands

AES identified two wetlands, one partially located onsite and the second located just offsite. Wetland Ais located near the western parcel boundary and within the southwest parcel corner and continues offsite to the west (Figures 8 and 9). Wetland A was rated under the Slope Hydrogeomorphic Classification (HGM) and is considered a Category II wetland that scored high on for habitat functions (8), Appendix C. Wetland B is located just offsite from the southeastern corner of the parcel and was rated under the Depressional HGM classification due to the large area of ponding observed. Wetland B rated as a Category II wetland with a habitat functions score of 8 (Appendix C).

Wetland Buffers

Under the Camas Municipal Code (CMC), wetland buffer widths are established by comparing the wetland rating habitat function score and overall category, and the intensity of proposed land use. Under CMC Table 16.53.040-4 residential use with density higher than 1-unit per acre is considered High Land Use Intensity (LUI). The proposed 38-lot single family residential subdivision will match the current zoning, Single-Family Residential (R-7.5) of the subject parcel comprised of 11.67 acres. The proposed density of the subdivision meets the definition of High LUI under the CMC. Under CMC Table 16.53.040-2, Category II wetlands with a habitat function score of 8 adjacent to proposed High LUI require 260-foot buffers, 195-foot buffers for Moderate LUI, and 130-foot buffers for Low LUI.

Riparian Habitat

Within the southeast corner of the subject parcel AES identified an unnamed seasonal, non-fish bearing (Type Ns) stream (Figures 8 and 9). Type Ns streams require a 25 ft riparian buffer under CMC 16.61.040.D. The areas flanking this stream to the north and south reflect upland conditions. It appears that seasonal hydrology flows from east to west have over time carved out a defined channel within this location.

WDFW Priority Habitat

Oregon white oak woodland and individual Oregon white trees were identified onsite and immediately offsite (Figures 8 and 9). Oregon white oak Priority Habitat is protected by WDFW and also jurisdictional under the local CMC habitat code. The understory and herbaceous layer associated with the onsite oak habitat is highly disturbed due to grazing, lawn mowing or areas dominated by Himalayan blackberry. The dripline of each oak tree canopy was located by survey and is depicted on Figure 8.

Table 1. Critical Areas Summary.

Critical Area	Buffer Width	
Wetland A Category II Wetland (Habitat Score: 8)	***Standard Wetland Buffer***	***LUI Wetland Buffer Reduction***
	260 ft = High LUI Buffer	195 ft = Moderate LUI Buffer
Type Ns Stream	25 ft Riparian Buffer	

BUFFER MITIGATION PLAN

The buffer mitigation plan was developed following Camas Municipal Code CMC) Sections 16.53 Wetlands to offset the project impacts proposed and allow for no net loss of habitat functions onsite.

Avoidance and Minimization

The construction of this residential subdivision within the appropriate zoning location will provide housing for the southwest Washington market, specifically high density residential within the City of Camas where the market demand is high. Following the mitigation sequencing, the project has avoided and minimized impacts to the full extent practicable while still meeting the required design and engineering elements for a subdivision of this size. To utilize the subject site to the fullest following the zoning defined by the city, a large footprint is required to allow for the residential lots, required stormwater facility, internal roadways and the development entrance/exit adequate to accommodate the subdivision. However, the subject site is highly constrained due to due to Category II wetlands and Oregon white oak habitat (Figures 8 and 9).

Despite the large constraints that the critical areas impose, the proposed project has been designed to avoid direct impacts to the wetlands, Oregon white oak habitat, and the highest functioning mature forested buffer habitat present onsite. Additionally, the project proposes extensive wetland buffer enhancement and Oregon

white oak habitat restoration – including habitat corridor connectivity between these historically separated habitats. Therefore, the unavoidable impacts will be offset with adequate mitigation onsite for no net loss of habitat function or values.

The offsite portion of the Wetland A unit provides moderately high to high functions. However, the onsite portion of Wetland A has had historic impacts due to excavation to create a pond within the wetland. The buffer habitat onsite within the southwestern corner of the subject parcel has also been degraded by historic agricultural use/grazing, mowing and is generally dominated by monotypic vegetation including invasive reed canarygrass, lawn grasses, and non-native Himalayan blackberry. This has resulted in a lack of biodiversity and special habitat features, with minimal plant community structure for the onsite wetland and buffer. The project has shown avoidance and minimization of impacts by avoiding direct impacts to the highest functioning buffer habitat and oak habitat while utilizing the historically impacted areas of the subject site for development (existing building footprints, parking and driveway areas, maintained lawn areas, and historic agriculture fields that have been highly managed over the history of the site due to equestrian use). The southern and southwest areas of the subject site are the most constrained due to the significant wetland buffers and oak habitat located in this area. These critical areas highly constrain this portion of the site, thereby making full use of this open area impossible without buffer impacts of some degree. Where the site is less constrained in the east, the project was designed to hold the standard base wetland buffer widths (Figure 9).

The proposed single-family residence subdivision has been designed to avoid onsite critical areas to the extent possible while still providing a residential subdivision meeting the density and design requirements required by the City of Camas. The onsite wetland, stream buffer, and Oregon white oak habitat present have been avoided by the proposed development. However, with the majority of the southern subject parcel encumbered by a substantial wetland buffer (260 feet), impacts to this buffer area are unavoidable. Therefore, the project proposes to modify the buffer area over an area of historically impacted and maintained lawn surrounding the existing house in the southwest portion of the subject parcel.

Wetland Buffer Reduction

CMC 16.53.050.C.1.a.i-ii allows the standard High LUI wetland buffer width (260 ft) to be reduced to the Moderate LUI buffer (195 ft) if a relatively undisturbed corridor at least 100-ft feet wide is protected between the wetland and any other priority habitats present (as defined by the WDFW) and measures to minimize the impacts of the land use adjacent to the wetlands are applied.

In addition to the wetland and buffer habitat identified onsite, Oregon white oak habitat is present onsite and is classified by WDFW as a priority habitat (Figures 8 and 9). Though there are portions of Wetland A offsite that provide moderate to high functions due the scrub-shrub and forested habitat present, the onsite portions of the onsite wetland buffer habitat is degraded from historic residential mowing and overall lacks diversity of the vegetation and habitat structure. The project proposes reduction of the 260 ft High LUI wetland buffer to the 195 ft Moderate LUI buffer by establishing 100 ft minimum corridor between Category II wetlands and the onsite Oregon white oak priority habitat (Figure 9). In many areas the proposed corridor exceeds 100 ft width, see Figure 9. The proposed habitat corridor connectivity is quite extensive, as it will essentially connect the central oak habitat west and south to the Wetland A buffer, then continue east connecting to the Wetland B buffer and multiple individual oak trees present within this area along the eastern property line.

Additionally, the restoration of the central oak habitat area is proposed as the existing asphalt driveway will be removed and be replaced with native vegetation/understory enhancement. By removing this section of

paved driveway, an even more extensive habitat corridor connection between the onsite oak habitat and the wetland will be provided as the driveway has acted to fragment this oak habitat for many years.

The project has also been designed to minimize the impacts of the land use adjacent to the wetlands in accordance with CMC 16.53.050.C.1.a.ii. The proposed project includes stormwater infiltration and has been designed so that development is located outside of areas currently dominated by native vegetation, areas of mature native forested buffer vegetation and the Oregon white oak habitat present onsite. The development has also been designed to be located as far as possible from the onsite wetland to avoid and minimize noise and light directed to the wetland. After implementing the above buffer reduction allowance, the modified base buffer width is considered to be the Moderate LUI buffer or 195 feet.

Wetland Buffer Impacts to the Modified Buffer

After modifying the standard buffer from 260 feet to 195 feet and applying the above outlined avoidance and minimization measures to the onsite critical areas, the project will have unavoidable impacts to two portions of the outer 195-foot wetland buffer over a total area of 25,983 sf. These impact areas can be offset by enhancement over 74,831 sf of the adjacent buffer at a 2.88:1 ratio to the impact area, Figure 9. As outlined by CMC, buffer reduction is allowed over degraded areas when invasive species removal (of the Himalayan blackberry present) and native enhancement is provided to offset the potential loss of buffer functions and values.

Wetland Buffer Impacts due to Stormwater Facility

To allow for the stormwater pond within the buffer of the Category II wetland with a high habitat score (8), additional buffer impacts and mitigation are proposed. Even though the offsite portions of the wetland unit provide higher functions, this onsite buffer area where the stormwater facility is proposed is degraded and consists of monotypic lawn grasses with no significant vegetation to be impacted. The area of buffer impact imposed by the stormwater facility has been quantified to be 11,010 sf, Figure 9. The project proposes to offset this buffer impact area at approximately a 1.24:1 ratio by buffer averaging nearby (and north of the standard 260-foot base buffer width otherwise held by the project along the eastern property boundary) over an area totaling 13,698 sf in size, Figure 9.

Additionally, this buffer averaging area (as well as the adjacent buffer to the south) will be enhanced resulting in a 3:1 mitigation ratio to the impacts. A total of 33,030 sf of buffer habitat will be enhanced and when combined with the averaging area (which exceeds the standard 1:1 ratio) these mitigation measures will ensure that the construction of the stormwater facility within the outer portion of the Category II buffer will have no net loss of buffer area or functions. Additionally, the area surrounding the stormwater facility to the south will be enhanced as it is part of the overall buffer enhancement previously outlined. Under CMC 16.53.050.2, wetland buffer averaging is allowed in conjunction with other reductions in buffer width.

This buffer averaging and enhancement area also contains individual Oregon white oak habitat that can be connected to the central and southern oak habitat/wetland buffer vegetated corridor when combined with the native buffer enhancement activities allowing for the maximum onsite corridor connection possible between the various habitats.

Habitat Enhancement Summary

In total, the habitat enhancement proposed will cover 126,908 sf. This total enhancement area is comprised by the onsite wetland buffer areas totaling 107,861 (74,831 sf + 33,030 sf) and the Oregon white oak habitat restoration area of 19,047 sf. See Table 2 for a detailed summary of the proposed impacts and mitigation. By

enhancing this entire wetland buffer habitat with native trees and shrubs, it will not only upgrade the diversity of the vegetation and structure from the existing lawn, but it will provide a vegetated habitat corridor connection between all the critical areas; Wetlands A and B, Type Ns stream, and Oregon white oak habitat where no connection has historically been present. The buffer enhancement will include the addition of Oregon white oak trees, as well as other native trees and understory shrubs commonly found within oak woodland habitat. This will ultimately create a habitat that will meet the WDFW oak woodland criteria and will upgrade the buffer functions including shielding, habitat and overall diversity to the degraded buffer habitat onsite. As a result the mitigation proposed will provide greater connectivity for wildlife habitat, by increasing shade, shelter, and food sources within multiple locations onsite while also providing greater contiguous habitat corridor connections to the offsite forested wetland (Wetland A) associated with the Lacamas Creek habitat corridor.

Table 2. Impacts & Mitigation Summary.

Critical Area	Impact	Mitigation (Area) 107,861 sf.
Wetlands A & B Buffer Habitat	Buffer Reduction from High to Mod Buffer	**Provide Native Vegetated Corridor Connection Between Category II Wetlands and WDFW PHS** (minimum 100' in width) *Native enhancement of onsite wetland buffers to connect to Oregon white oak habitat* ***Total Habitat Corridor Enhancement Area:*** *"Wetland Buffer" (107,861 sf)* + *"Oak Restoration Area" (19,047 sf)* ***= 126,908 sf***
		Oak Habitat Restoration Area *Removal of Exist. Driveway & Native Enh.* (19,047 sf)
	Lot Impact to 195' Buffer **(25,983 sf)**	**Buffer Enhancement** @ 2.88:1 Ratio **(74,831 sf)**
	Stormwater Pond Impact to 195' Buffer **(11,010 sf)**	Buffer Averaging @ 1.24:1 Ratio (13,698 sf)
		Combined w/ Buffer Enhancement (Averaging area and adjacent buffer) @ 3:1 Ratio **(33,030 sf)**

Note: The total "Wetland Buffer Enhancement" Area includes (74,831 sf + 33,030 sf) = 107,861 as depicted by the aqua hatch on Figure 9.

PLANTING PLAN

Site Preparation

1. Stake or flag the on-site mitigation area boundaries and install tree protection fencing if necessary.

2. Aggressively mow grasses and/or remove invasive species present within the mitigation area prior to planting, paying particular attention to the removal and control of any Himalayan blackberry as requried.

Plant Materials

The plants specified for the buffer mitigation are native species designed to diversify the existing plant community, provide an increase in woody structure and wildlife habitat on a short- and long-term basis, thereby increasing the ecological functions of the riparian habitat. The specified shrubs will grow quickly, forming an intertwining understory layer within the mitigation areas, and over time the specified trees will provide structural and biological diversity.

Container Stock

Plants will be purchased from a native-plant nursery and meet size specifications outlined under the planting plan, see Table 3.

Bareroot Species

1. Plants will be purchased from a native plant nursery and meet size specifications outlined under the planting plan, see Table 3.
2. Bareroot sock will be kept cool and moist prior to being planted.
3. Bareroot stock will have well-developed roots and sturdy stems with a good root-to-shoot ratio.
4. No damaged or desiccated roots or diseased plants will be used.
5. Unplanted bareroot stock will be stored properly at end of planting day(s) to prevent desiccation.

Planting Methods

Plant in fall through early spring (October-April) at specified spacing following the planting plan.

Container/bareroot stock

1. Dig hole using a tree shovel/auger or comparable tool 16-inches wide and 4-inches deeper than the root system, scarify sides of hole to 4 inches. Remove plant from container and loosen roots with hand or score vertically on sides and bottom with knife. Set plant upright and plumb in hole so the crown is just above the finish grade. Ensure that roots are extended down entirely and do not bend upward.
2. Replace loose soil around plant and firmly compact the soil around the plant to eliminate air spaces. Do not use frozen soil for backfilling.
3. Firmly compact the soil around the planted species to eliminate air spaces.
4. Install woody mulch around the base of planted species to insulate plantings, maintain moisture content of soil and reduce invasive plant competition (when deemed necessary).
5. Irrigate according to performance standards for the first three summers after planting or as site and weather conditions warrant.

Planting Specifications

Planting will begin in Fall of 2025, or Winter/Spring of 2026 or Fall of 2026, while onsite soils are saturated (and stock is dormant). The following tables summarize the native plant selection, spacing, size, and quantity for the on-site mitigation area:

Table 3. Native Planting Plan.

Wetland Buffer Enhancement 107,861 sq. ft.				
Common Name	*Scientific Name*	*Stock*	*Spacing*	*Quantity*
Trees				
Oregon white oak	*Quercus garryana*	1-gallon or 24-36" bare-root	20 ft.	50
Douglas fir	*Pseudotsuga menziesii*	1-gallon or 24-36" bare-root	10 ft.	100
Big leaf maple	*Acer macrophyllum*	1-gallon or 24-36" bare-root	10 ft	100
Bitter cherry	*Prunus emarginata*	1-gallon or 24-36" bare-root	10 ft.	100
			Trees =	350
Shrubs				
Beaked hazelnut	*Corylus cornuta*	1-gallon or 24-36" bare-root	6 ft.	150
Nootka rose	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	200
Ocean spray	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	100
Serviceberry	*Amelanchier alnifolia*	1-gallon or 24-36" bare-root	6 ft.	100
Snowberry	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	200
Vine maple	*Acer circinatum*	1-gallon or 24-36" bare-root	6 ft.	100
			Shrubs =	850
			Grand Total =	**1,200**
Oregon White Oak Habitat Restoration 19,047 sq. ft.				
Common Name	*Scientific Name*	*Stock*	*Spacing*	*Quantity*
Trees				
Bitter cherry	*Prunus emarginata*	1-gallon or 24-36" bare-root	10 ft.	10
Cascara	*Frangula purshiana*	1-gallon or 24-36" bare-root	10 ft.	10
			Trees =	20
Shrubs				
Beaked hazelnut	*Corylus cornuta*	1-gallon or 24-36" bare-root	6 ft.	35
Nootka rose	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	35
Oceanspray	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	35
Serviceberry	*Amelanchier alnifolia*	1-gallon or 24-36" bare-root	6 ft.	35
Snowberry	*Symphoricarpos albus*	1-gallon or 24-36" bare-root	6 ft.	50
			Shrubs =	190
			Grand Total =	**210**

Oak Restoration Driveway Removal Area Seeding :	
Native Uplands Mix	**Recommended Seeding Rate**
Mix Includes: California Brome - *Bromus carinatus* Blue Wildrye - *Elymus glaucus* Streambank Lupine - *Lupinus rivularis* Western Yarrow - *Achillea millefolium*	1 lb. per 1,000 square feet

Notes:
1. The "Native Uplands" mix can be sourced from Sunmark Seeds. An adequate substitution is the "Native Upland Mix with Color" sourced from ProTime (PT 404).
2. (Buffer Reduction Area in Mod LUI Buffer (25,983 sf.) Mitigated for by Buffer Enhancement @ 2.88:1 ratio to Impacts or 74,831 sf.)(Storm Water Pond (11,010 sf.) Mitigated for by Buffer Enhancement @ 3:1 ratio to Impacts or 33,030 sf.)

Maintenance Plan
Maintenance of the buffer mitigation area(s) is a five-year process and will involve removing persisting invasive plant species in addition to watering and re-installing failed native species as necessary. The maintenance will include the following activities when necessary:

1. Remove and control non-native/noxious vegetation around all newly installed plants. During years 1 through 3 invasive species will be removed and suppressed as often as necessary to meet a performance standard of no greater than 20 percent cover by invasive species, measured by monitoring plots.

2. Irrigate planted species as necessary during the dry season, approximately July 1 through October 15. Irrigation is recommended to occur on a two-week cycle (minimum) during the dry season for the first three years. Water will be provided by a temporary above-ground irrigation system or a water truck.

3. Replace dead or failed plants as described for the original installation to meet the minimum annual performance standard of 100% survival in the first year, 90% survival in the second year, and 80% survival in years 3-5.

Monitoring Plan
The buffer mitigation area(s) will be monitored for a 5-year period following project construction; monitoring will take place in years 1, 2, 3 and 5. Monitoring reports will be submitted to the City of Camas by the end of each monitored year. The goal of monitoring is to determine if the previously stated performance standards are being met. The mitigation area will be monitored once during the growing season, preferably during the same two-week period each year to better compare the data.

During the first annual monitoring and maintenance event, two representative photo plots will be selected in the mitigation areas permanently marked with metal posts. Monitoring photo plot locations will be placed on an as-built drawing and included in the annual monitoring reports.

Vegetation
Vegetative monitoring will document the woody scrub-shrub canopy developing within the mitigation area. The following information will be included at each sample plot:

- Percent cover and frequency of sapling/shrub species
- Species composition of herbs, shrubs, and trees, including non-native/noxious, invasive species

- Photo documentation of vegetative changes over time

Monitoring Report Contents
The annual monitoring reports will contain at least the following:

- Location map and as-built drawing.
- Photographs from permanent photo points (x2 minimum).
- Historic description of project, including dates of plant installation, current year of monitoring, and restatement of mitigation goal.
- Documentation of plant survival, cover, and overall development of the plant community.
- Assessment of non-native, invasive plant species and recommendations for management.
- Summary of maintenance and contingency measures proposed for the next season and completed for the past season.

Contingency Plan
If the performance standards are not met by the fifth year following project completion, or at an earlier time if specified above, a contingency plan will be developed and implemented. All contingency actions will be undertaken only after consulting and gaining approval from the City of Camas. The applicant will be required to complete a contingency plan that describes (1) the causes of failure, (2) proposed corrective actions, (3) a schedule for completing corrective actions, and (4) whether additional maintenance and monitoring are necessary.

Site Protection
The on-site mitigation area will be owned and managed by the applicant or assignee. AshEco Solutions, LLC or similar entity will be responsible for supervising the maintenance and conducting the monitoring of the on-site mitigation area for the 5-year period at expense of the applicant. The applicant will establish and record a permanent and irrevocable conservation covenant on the mitigation property.

MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS

Objective 1: Provide a native vegetated habitat corridor between the wetlands and Oregon white oak habitat, and enhance 107,861 sf of the wetland buffer with natives following Table 3.
Performance Standard 1a. Document the installation of the native plant species specified by Table 3. Submit As-built documenting planting locations, plant species, and plant quantities. *Site prep is to include the removal of invasive species as needed.*
Performance Standard 1b. In Year 1, planted species are to achieve 100 percent (100%) survival one year after the site is planted. The survival rate is to be determined by comparison of baseline vegetation data collected during production of the As-built Map. (If dead plants are replaced in Year 1 to achieve the 100 percent survival rate, this performance standard will be met).
Performance Standard 1c. In Year 2, mitigation plant communities will achieve the densities listed in Table 4.
Performance Standard 1d. In Year 5, the mitigation plant community will achieve 30-percent (30%) aerial cover of woody species. (If plants are added, that achieve this cover requirement, this performance standard will be met).
Performance Standard 1e. In All Years, non-native/invasive plant species will not exceed 20-percent (20%) aerial cover across the onsite mitigation area.

Objective 2: Provide the Oregon white oak habitat restoration over 19,047sf (as depicted on Figure 9) to provide full connectivity between the wetland and oak habitat onsite and enhance with natives as outlined in Table 3.
Performance Standard 2a. Document the removal of the existing paved driveway and the installation of the native grass seed within old driveway footprint and install native shrub species as specified by Table 3. Submit As-built documenting planting locations, plant species, and plant quantities.
Performance Standard 2b. In Year 1, planted species are to achieve 100 percent (100%) survival one year after the site is planted. The survival rate is to be determined by comparison of baseline vegetation data collected during production of the As-built Map. (If dead plants are replaced in Year 1 to achieve the 100 percent survival rate, this performance standard will be met).
Performance Standard 2c. In Year 2, mitigation plant communities will achieve the densities listed in Table 4.
Performance Standard 2d. In Year 5, the mitigation plant community will achieve 30-percent (30%) aerial cover of woody species. (If plants are added, that achieve this cover requirement, this performance standard is met).
Performance Standard 2e. In All Years, non-native/invasive plant species will not exceed 20-percent (20%) aerial cover across the onsite mitigation area.

Objective 3: Provide 13,698 sf buffer averaging area to offset the location of the stormwater facility within the buffer at a 1.24:1 ratio.
Performance Standard 3a. Document the buffer averaging area (as depicted on Figure 9) within the conservation covenant.
Performance Standard 3b. Enhance the buffer averaging area as part of the total buffer enhancement proposed under Objective 1, following the outlined performance standards for Objective 1.

Objective 4: Provide long-term protection for the buffer enhancement areas.
Performance Standard 4a. Record a conservation covenant with the City of Camas. This performance standard will be met when the Year 1 monitoring report is submitted that includes a copy of the approved and recorded conservation covenant.
Performance Standard 4b. Post permanent boundary signage every 200 feet along the outer edge of the onsite mitigation boundary or as otherwise determined by the Shoreline Administrator. Signage will remain in legible condition; if they are missing or illegible, they will be replaced. This performance standard will be met when signs are documented to be in place and of good condition within the final monitoring report.

Signs are to read:

"Critical Area – Please Retain in a Natural State"

or as otherwise determined by the City of Camas permit conditions.

Table 4. Performance Standards by Monitoring Year.

Habitat Type	Performance Standards by Year			
	Year 1	Year 2	Year 3	Year 5
Wetland Buffer and Oak Woodland Enhancement Areas				
Planted Vegetation Survival	100%	---	---	---
Woody Species Density	---	10-14' respectively (on center)	10-14' respectively (on center)	---
Woody Species Aerial Cover	---	---	---	30%
Invasive Plant Species				
Invasive/Non-native plant species	< 10%	< 20%	< 20%	< 20%

CONCLUSIONS

The above sections outline how the proposed project will meet the CMC Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. The project will not impose direct impact the onsite wetlands, unnamed seasonal stream or buffer and will also retain all of the Oregon white oak habitat present onsite. The buffer mitigation proposal will ultimately result in an ecological uplift of the onsite wetland buffers and oak habitat while providing extensive connectivity by providing a native vegetated corridor connecting all critical area habitats over degraded areas that have been historically fragmented the habitat connectivity. With issuance of the approved critical areas permits, the proposed buffer mitigation activities will be implemented, and a conservation covenant will be recorded to protect the onsite critical areas and critical area buffers, under the applicant's ownership, in perpetuity.

DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigator. It is correct and complete to the best of our knowledge. It should be considered a preliminary mitigation plan and used at your own risk until it has been reviewed and approved in writing by the local agency with jurisdiction over the site. AES personnel base the above listed conclusions on standard scientific methodology and best professional judgment.

REFERENCES

City of Camas Municipal Code. 2008 (Amended). Section 16.53 Wetlands.

City of Camas Municipal Code. 2008 (Amended). Section 16.61 Fish and Wildlife Habitat Conservation Areas.

Clark County Geographic Information Systems. Available at: http:/gis.clark.wa.gov/mapsonline/ [Accessed 2025].

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Online edition. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Olson, P. & Stockdale, E. 2010. Washington State Department of Ecology: Determining the Ordinary High Water Mark on Streams in Washington State. Second Review Draft. Ecology Publication #08-06-001.

U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). 1974. Soil Survey of Clark County Area. Online document. Available at: http://websoilsurvey.nrcs.usda.gov/app/. [Accessed August 2022]

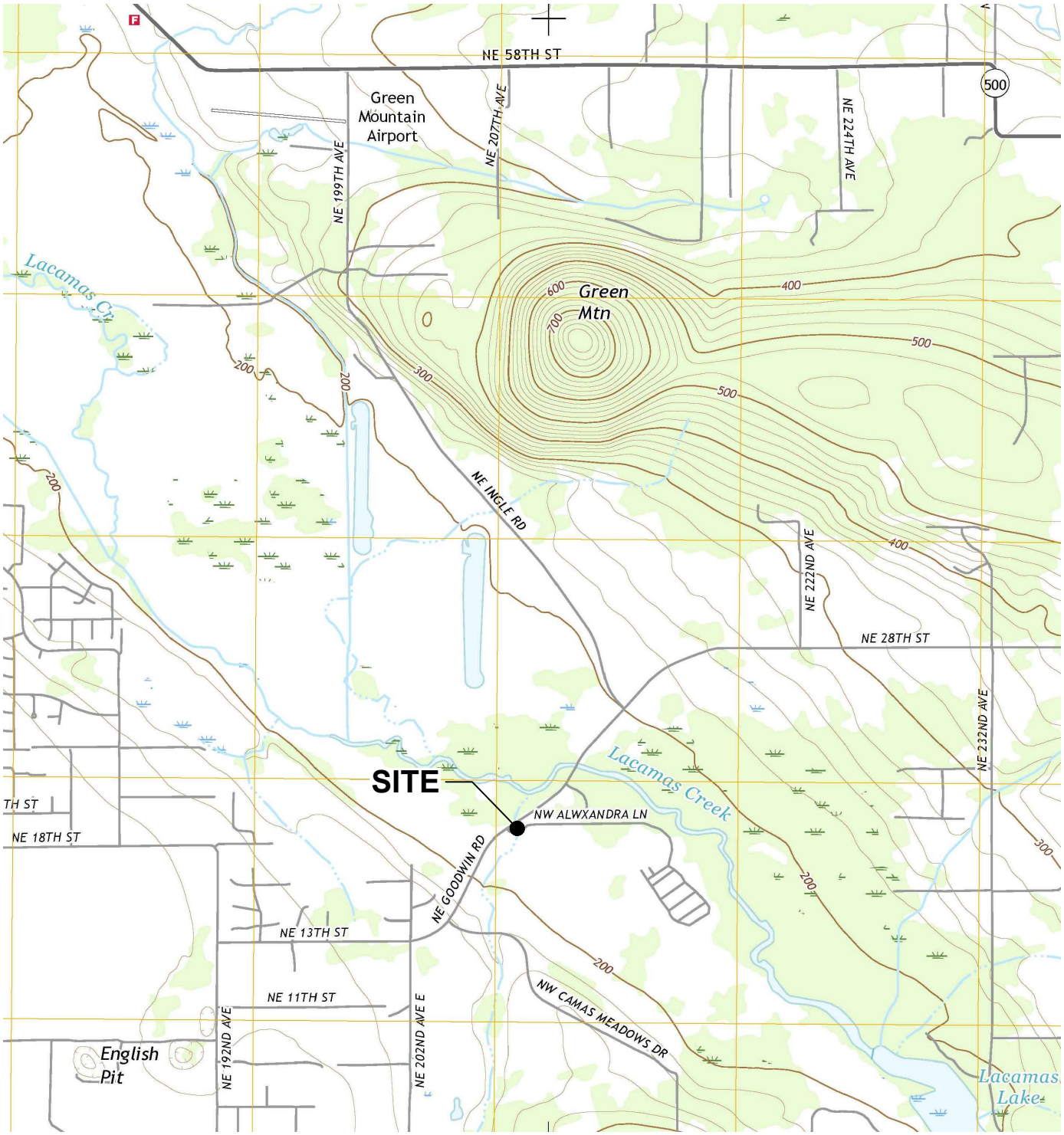
U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). 2022. Washington State Hydric Soils List. Available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. [Accessed 2025].

U. S. Fish & Wildlife Service. 2022. National Wetlands Inventory. Online document. Available at: http:www.wetlandsfws.er.usgs.gov/NWI/index.html. [Accessed 2025].

Wakeley, J.S.; R.W. Lichvar; and C.V. Noble, eds. U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Washington State Department of Ecology (WDOE). 1997. Washington State Wetlands Identification and Delineation Manual. Publication #96-94. Olympia, Washington.

Washington State Department of Fish and Wildlife (WDFW). Management Recommendations for Washington's Priority Habitats – Oregon White Oak Woodlands (Larsen, 1998).



NOTE(S):
USGS, LACAMAS CREEK QUADRANGLE
WASHINGTON-CLARK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

Ash ECO SOLUTIONS, LLC

PURPOSE: XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	VICINITY MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 1 **DATE:** 4-15-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg



Legend

- Taxlots
- Contours Lines - 2 ft
- Contour Lines - 10 ft
- Contour Lines - 100 ft

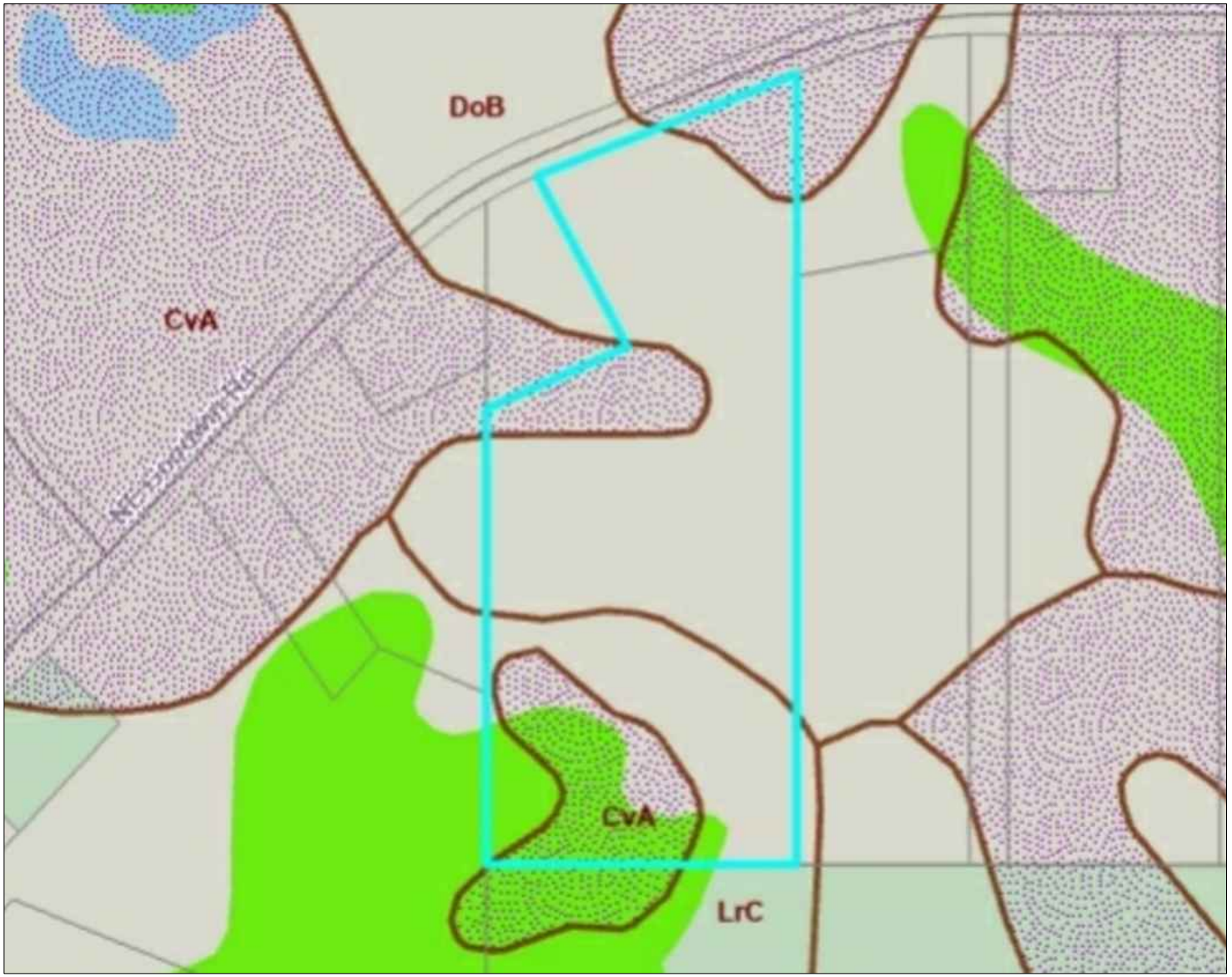
N

0 250 500

SCALE IN FEET
1" = 250'

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg

AshECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	AERIAL PHOTO & TOPO MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 2 **DATE:** 4-15-25



Legend

- Taxlots
- Soil Type
- Hydric Soils
- Potential Wetlands Presence
- Permitted Wetland
- NWI Wetland

CvA - Cove silty loam, 0 to 3 percent slopes

DoB- Dollar loam, 0 to 5 percent slopes

LrC - Lauren gravelly loam, cemented substratum, 3 to 15 percent slopes

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC

PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

SOIL SURVEY &
NATIONAL WETLANDS INVENTORY MAP
APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: PLH Goodwin Rd.
PARCEL #: 173192000
SITE LOCATION ADDRESS:
2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 3
DATE: 4-15-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg



Legend

- Taxlots
- Species
  - Species Area
  - Adjacent to Species Area
- Habitat
  - Habitat Area
  - Adjacent to Habitat Area
- Riparian Habitat
- Stream
- Lake

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC

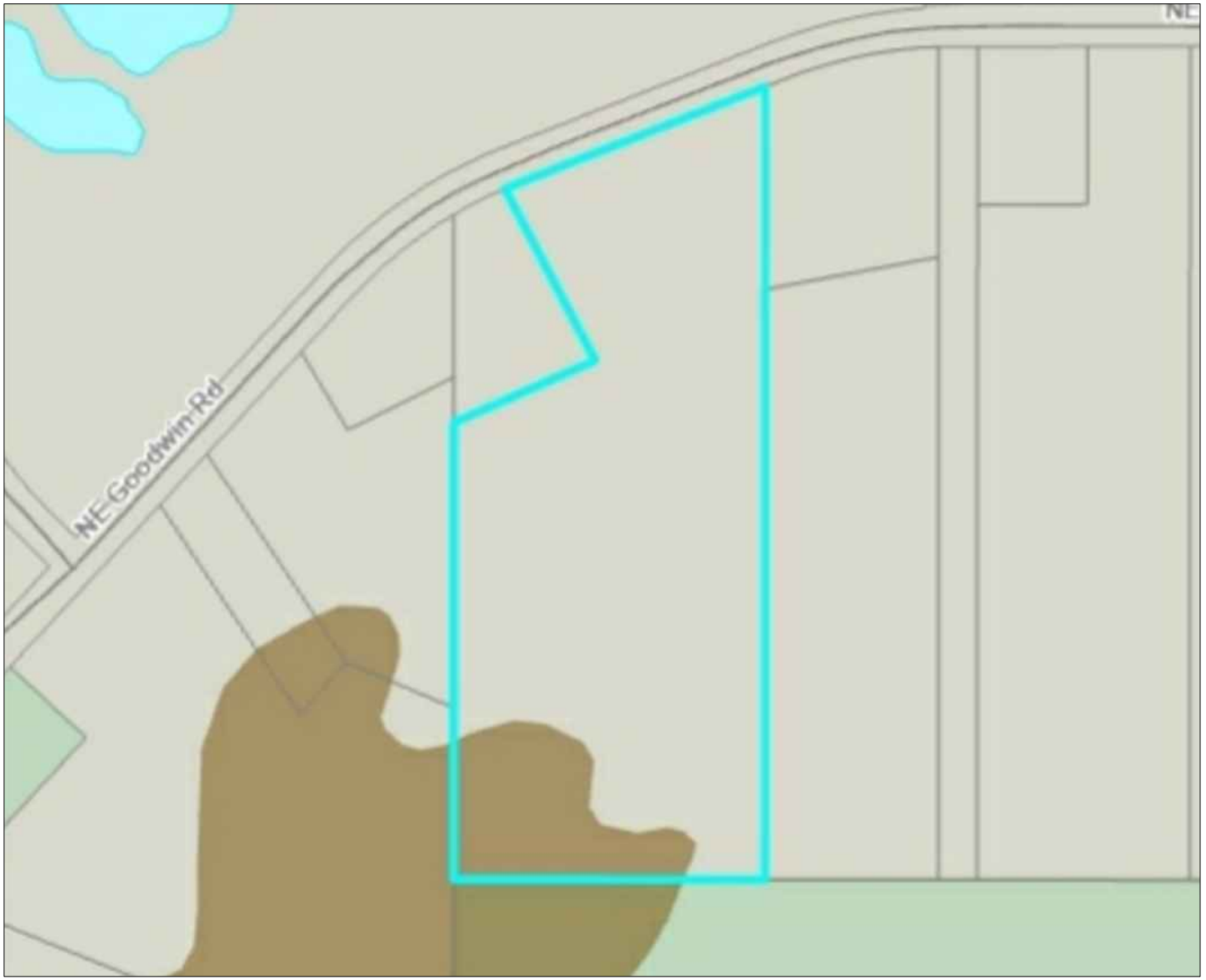
PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

RIPARIAN HABITAT & SPECIES MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: PLH Goodwin Rd.
PARCEL #: 173192000
SITE LOCATION ADDRESS:
2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 4
DATE: 4-15-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg



Legend

- Taxlots
- Stream
- Lake
- Shoreline Designations
  - Aquatic
  - Natural
  - Urban Conservancy
  - Medium Intensity
  - High Intensity
  - Rural Conservancy Residential
  - Rural Conservancy Resource Land

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC

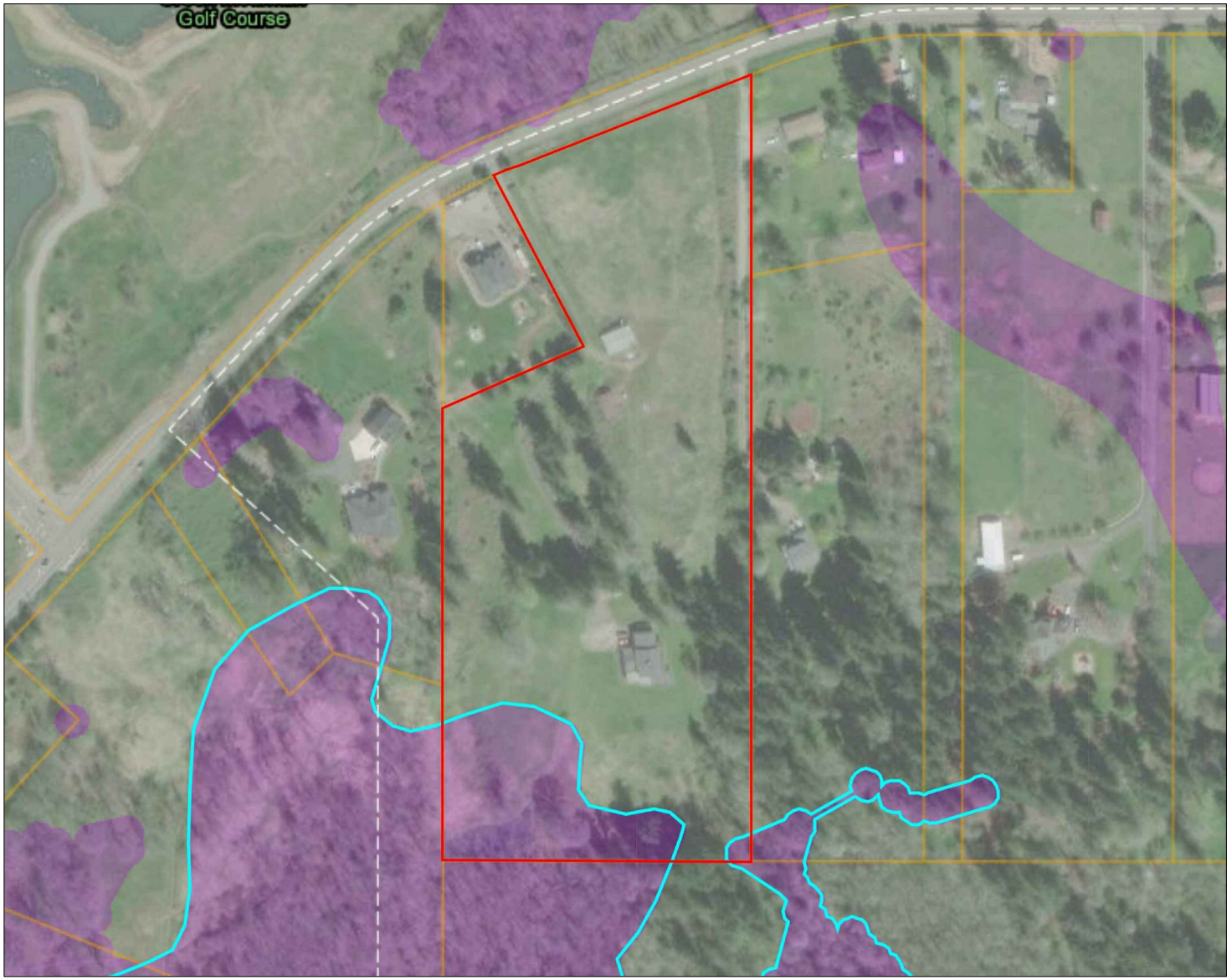
PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

SHORELINES MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: PLH Goodwin Rd.
PARCEL #: 173192000
SITE LOCATION ADDRESS:
2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 5
DATE: 4-15-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg



Legend

Parcels

Parcels

PHS on the Web

PHS Public Points

PHS Public Lines

PHS Public Polygon Outlines

AS MAPPED

Masked

PHS Public Polygons

AS MAPPED

SECTION

QTR-TWP

TOWNSHIP

N

0 250 500

SCALE IN FEET

1" = 250'

Ash ECO SOLUTIONS, LLC

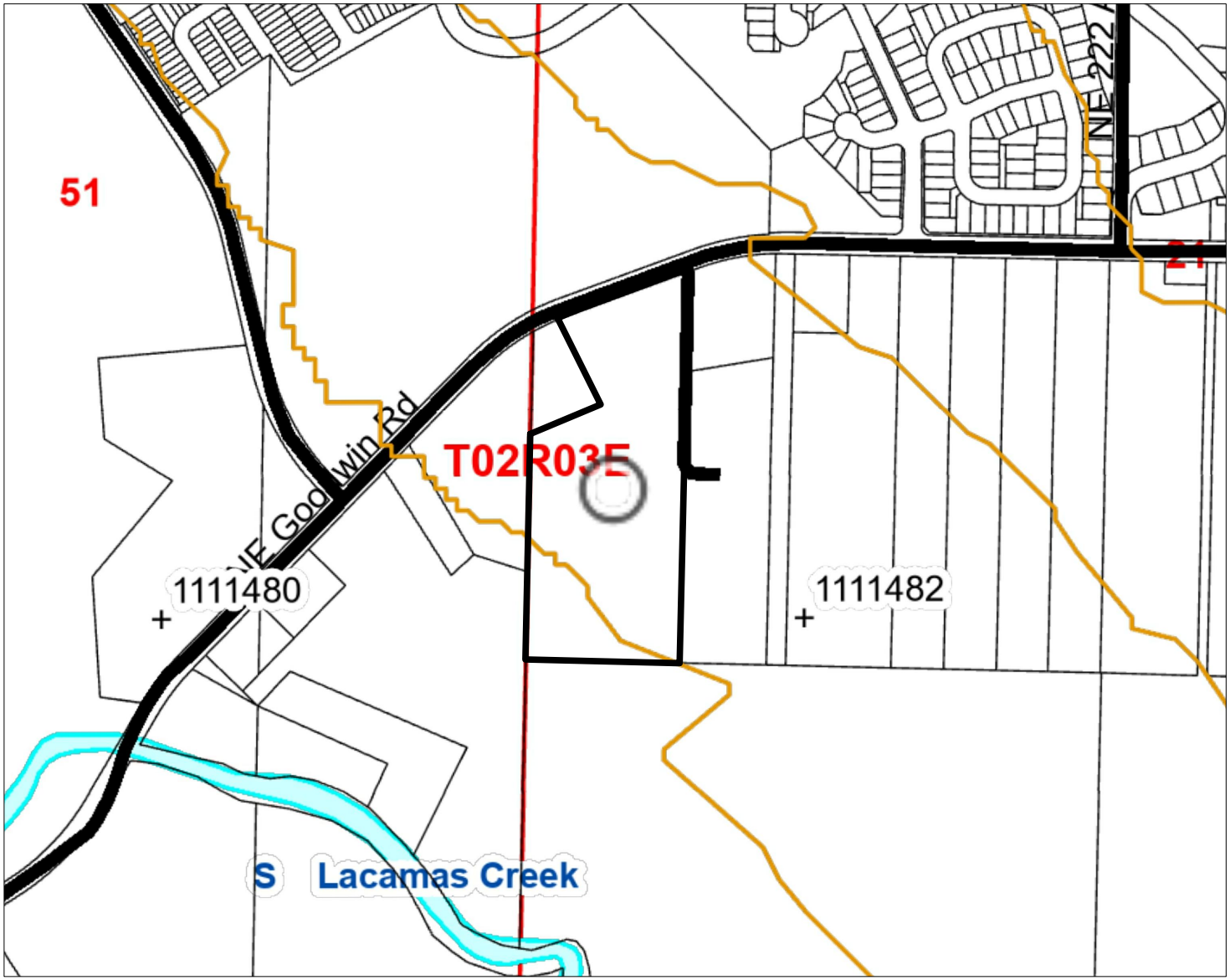
PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

PRIORITY HABITAT & SPECIES MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: PLH Goodwin Rd.
PARCEL #: 173192000
SITE LOCATION ADDRESS:
2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 6
DATE: 4-15-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg



N

0 500 1000

SCALE IN FEET
1" = 500'

Ash ECO SOLUTIONS, LLC

PURPOSE: XX
Line 1
Line 2
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

FPARS MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: PLH Goodwin Rd.
PARCEL #: 173192000
SITE LOCATION ADDRESS:
2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 7
DATE: 4-15-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-041425.dwg



I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-043025.dwg

AshECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	EXISTING CONDITIONS **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 8 **DATE:** 4-30-25

LEGEND:

- Site Boundary
- Wetland Boundary
- Wetland Buffer
- Stream
- Stream Buffer
- Oregon White Oak canopy to be retained

Notes:
Buffer Mod Plan:
1. Red from High to Mod by providing the 100' habitat corridor connection between the wetland and Oregon white oak habitat.
2. Offset impacts to the Mod LUI Buffer w/ Buffer Enhancement over remaining buffer.

#173192000
(11.67 Ac.)

Existing Driveway

Oregon White Oak Habitat Restoration (Existing Asphalt Driveway to be removed and oak understory to be enhanced w/ shrubs. Wood chip pedestrian trail and 3 picnic benches). (19,047 sf.)

260'

195'

107'

Buffer Reduction Area w/in the Mod LUI Buffer (25,983 sf.) (Mitigated for by Buffer Enhancement @ 2.88:1 ratio to Impacts or 74,831 sf.)

Total Buffer Enhancement Area (107,861 sf.)

Functionally Isolated Buffer

Buffer Averaging (13,698 sf.) (Mitigates for Stormwater Pond buffer impacts @ 1.24:1 ratio)

260' High LUI Buffer

195' Mod LUI Buffer

Stormwater Pond (11,010 sf.) (Mitigated for by Buffer Enhancement @ 3:1 ratio to Impacts or 33,030 sf.)

Wetland A
Slope
Category II
Habitat Score = 8

Pond

82'

Type Ns Water
25' Buffer

Wetland B
Depressional
Category II
Habitat Score = 8

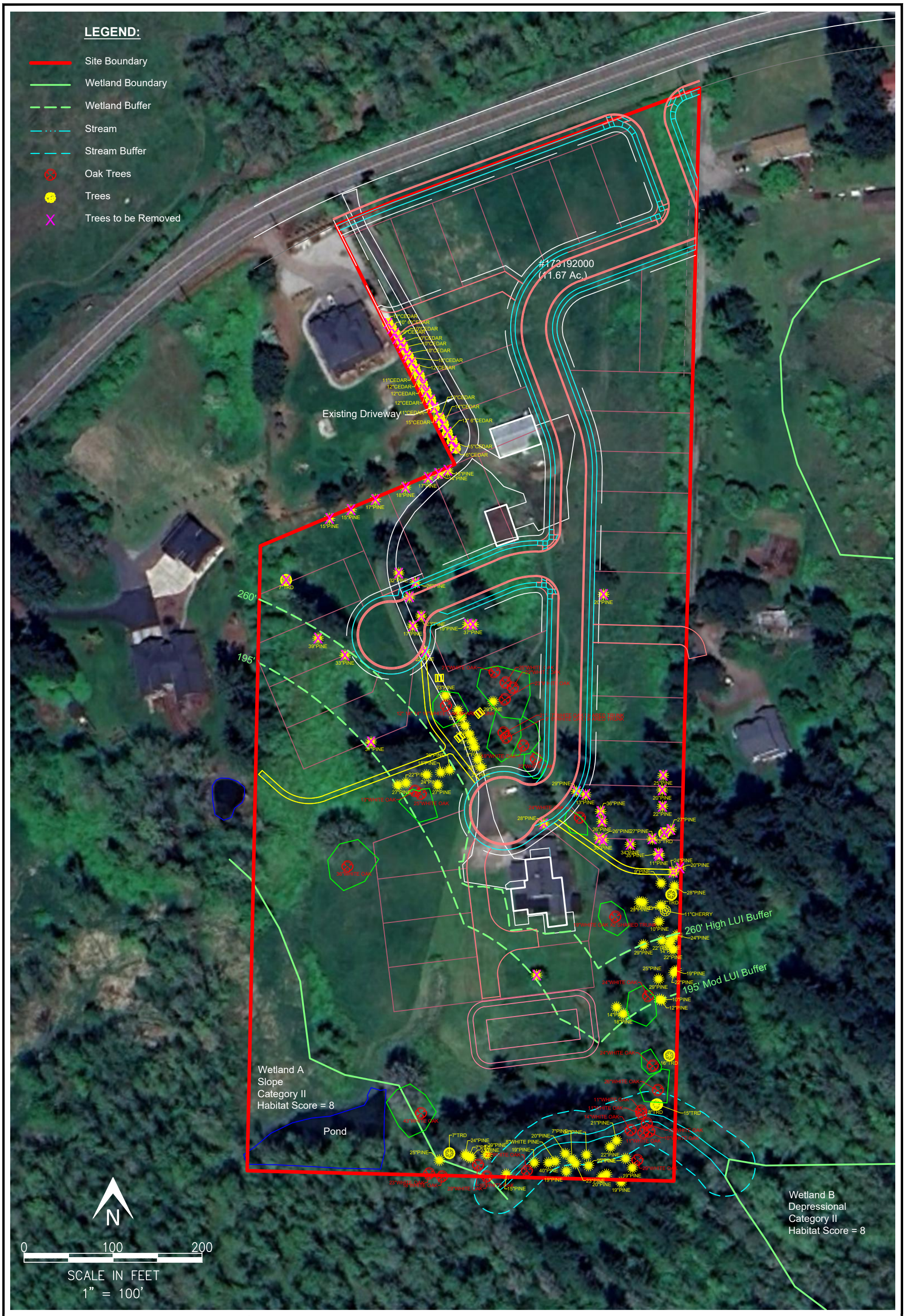
N

0 100 200

SCALE IN FEET
1" = 100'

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-050625.dwg

Ash ECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	PROPOSED SITE PLAN **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 9 **DATE:** 5-6-25



Ash ECO SOLUTIONS, LLC	**PURPOSE:** XX Line 1 Line 2 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	TREE PLAN **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** PLH Goodwin Rd. **PARCEL #:** 173192000 **SITE LOCATION ADDRESS:** 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 10 **DATE:** 5-6-25

I:\Autocad Files\AshECO Autocad\PLH Goodwin Road\Goodwin_BM-050625.dwg

Appendix A

Site Photos

Reserve at Green Mountain - Site Photos



Photo 1.
View of the existing residence located within the southern portion of the proposed development. This southern open area of the parcel generally degraded from landscape mowing activities as it is dominated by grass lawn.



Photo 2.
View of the general area, north of the existing residence, within the proposed development.



Photo 3.
View into a portion of Wetland A dominated by invasive reed canarygrass. The eastern extent of this wetland along the western parcel boundary of the subject parcel is dominated by Himalayan blackberry.

Reserve at Green Mountain - Site Photos



Photo 4.
View east over the man-made pond excavated within Wetland A, located in the southwest corner of the subject parcel. An individual Oregon white oak tree present directly northeast of the pond is visible in upper/central portion of this photo.



Photo 5.
View into Oregon white oak located with central area of the site. This oak habitat will be retained and the understory enhanced with native shrubs.



Photo 6.
View of the individual Oregon white oak located along the western property boundary. Wetland A is located directly west from this oak tree, at left of photo view. This oak will be retained and a habitat corridor connection will be created by implementing the buffer mitigation plan. This includes retention of this oak and other adjacent oaks and the enhancement of the surrounding habitat corridor to provide a vegetated wildlife corridor where none has historically been present due to the existing maintained lawn and driveway.

Reserve at Green Mountain - Site Photos



Photo 7.
View south down the existing paved residential driveway that has bisected the Oregon white oak habitat located within the central portion of the parcel. The driveway will be removed and the understory habitat restored with native plantings to provide a vegetated corridor connecting the mature oak habitat onsite as well as connect it to the nearby wetland habitat. corridor to provide a vegetated wildlife corridor where none has historically been present due to the existing maintained lawn and driveway.



Photo 8.
View west down the Type Ns stream that conveys seasonal hydrology down slope from Wetland B in the east to Wetland A in the west.





Photo 9.
View into the central ponded portion of Wetland B located just off site to the east.

Appendix B

Wetland Determination Datasheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: The Reserve at Green Mt - Wetland A City/County: Camas/Clark Sampling Date: _____

Applicant/Owner: Pacfic Lifestyle Homes State: WA Sampling Point: TP-1

Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0-3

Subregion (LRR): LRRA Lat: 45.639463° Long: -122.451880° Datum: _____

Soil Map Unit Name: Cove silty clay loam, 0-3% slopes NWI classification: PFOA - South of subject site

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:
Test plot is located in upland. Only one of 3-wetland indicators is present. Dominate vegetation is faculative.
No hydric soils or hydrology indicators occur within plot.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: 30ft diameter)			
1. Rubus armeniacus	100%	Y	FAC
2.			
	100% = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: TP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/2	100%						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: The Reserve at Green Mt - Wetland A City/County: Camas/Clark Sampling Date: _____

Applicant/Owner: Pacfic Lifestyle Homes State: WA Sampling Point: TP-2

Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0-3%

Subregion (LRR): LRRA Lat: 45.639463° Long: -122.451880° Datum: _____

Soil Map Unit Name: Lauren gravelly loam, cemented substratum, 3% to 15% slopes NWI classification: PFOA - South of subject site

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:
Test plot is located in upland. Only one of 3-wetland indicators is present. Dominate vegetation is faculative.
No hydric soils or hydrology indicators occur within plot.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30ft diameter)			
1. Salix sitchensis	40%	Y	FACW
2.			
3.			
4.			
5.			
	40% = Total Cover		
Herb Stratum (Plot size: 5ft diameter)			
1. Phalaris arundinacea	90%	Y	FACW
2. Juncus effusus	10%	N	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: TP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/2	98%	5YR 3/2	2%	C	M	clay loam	
							clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 2" BGS

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: The Reserve at Green Mt - Wetland A City/County: Camas/Clark Sampling Date: _____

Applicant/Owner: Pacfic Lifestyle Homes State: WA Sampling Point: TP-3

Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0-3

Subregion (LRR): LRRA Lat: 45.639463° Long: -122.451880° Datum: _____

Soil Map Unit Name: Cove silty clay loam, 0-3% slopes NWI classification: PFOA - South of subject site

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:
Test plot is located in upland. Only one of 3-wetland indicators is present. Dominate vegetation is faculative. No hydric soils or hydrology indicators occur within plot.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft diameter)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudotsuga menziesii	60%	Y	FACU
2. Tsuga heterophylla	20%	Y	FACU
3.			
4.			
	80% = Total Cover		
Sapling/Shrub Stratum (Plot size: 30ft diameter)			
1. Symphoricarpos albus	20%	Y	FACU
2.			
3.			
4.			
5.			
	20% = Total Cover		
Herb Stratum (Plot size: 5ft diameter)			
1. Polystichum munitum	20%	Y	FACU
2. Tellima grandiflora	20%	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: 30ft diameter)			
1. Rubus armeniacus	30%	Y	FAC
2.			
	30% = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

SOIL

Sampling Point: TP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16"	10YR 4/1	100%					loamy clay	mixed matrix
	10YR 4/2	100%					loamy clay	mixed matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: The Reserve at Green Mt - Wetland A City/County: Camas/Clark Sampling Date: _____

Applicant/Owner: Pacfic Lifestyle Homes State: WA Sampling Point: TP-4

Investigator(s): Andrea Aberle Section, Township, Range: SW 1/4, S21, T2N, R3E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0-3%

Subregion (LRR): LRRA Lat: 45.639463° Long: -122.451880° Datum: _____

Soil Map Unit Name: Lauren gravelly loam, cemented substratum, 3% to 15% slopes NWI classification: PFOA - South of subject site

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:
Test plot is located in upland. Only one of 3-wetland indicators is present. Dominate vegetation is faculative.
No hydric soils or hydrology indicators occur within plot.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30ft diameter)			
1. Symphoricarpos albus	40%	Y	FACU
2. Rosa nutkana	20%	Y	FACU
3.			
4.			
5.			
	40% = Total Cover		
Herb Stratum (Plot size: 5ft diameter)			
1. Phalaris arundinacea	40%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: 30ft diameter)			
1. Rubus armeniacus	20%	Y	FAC
2.			
	20% = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: TP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 4/2	98%	5YR 3/2	2%	C	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ **No** _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ✓ No _____ Depth (inches): 0.5-1"

Water Table Present? Yes ✓ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix C

Wetland Rating Form & Figures

Wetland name or number Wetland A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): The Reserve at Green Mt - Wetland A Date of site visit: 3/25

Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___No Date of training 10/16

HGM Class used for rating slope Wetland has multiple HGM classes? ___Y ✓ N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY II (based on functions ✓ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27
✓ **Category II** – Total score = 20 - 22
_____**Category III** – Total score = 16 - 19
_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M **L**	H **M** L	**H** M L	
Landscape Potential	H **M** L	H **M** L	H **M** L	
Value	**H** M L	H **M** L	**H** M L	**TOTAL**
Score Based on Ratings	6	6	8	20

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	

Wetland name or number Wetland A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	Figure 1
Hydroperiods	H 1.2	Figure 1
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	Figure 1
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	Figure 1
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	Figure 1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	Figure 2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	Figure 3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	Figure 3

Wetland name or number Wetland A

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ✓ The wetland is on a slope (slope can be very gradual),
   ✓ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   ✓ The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number Wetland A

5. Does the entire wetland unit **meet all** of the following criteria?
   ____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**
   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number Wetland A

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (A 1% slope has a 1 ft vertical change in elevation for every 100 ft of horizontal distance.) Slope is 1% or less — points = 3 Slope is > 1%-2% — points = 2 Slope is > 2%-5% — points = 1 Slope is greater than 5% — points = 0	2
S 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed, and plants are higher than 6 in. Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 Dense, uncut, herbaceous plants > ½ of area — points = 3 Dense, woody, plants > ½ of area — points = 2 Dense, uncut, herbaceous plants > ¼ of area — points = 1 Does not meet any of the criteria above for plants — points = 0	3
Total for S 1 — Add the points in the boxes above	5

Rating of Site Potential If score is: **__12 = H ___6-11 = M ✓__0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources adjacent septic systems Yes = 1 No = 0	1
Total for S 2 — Add the points in the boxes above	2

Rating of Landscape Potential If score is: **✓1-2 = M ___0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? (At least one aquatic resource in the basin is on the 303(d) list.) Yes = 1 No = 0	1
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which unit is found.) Yes = 2 No = 0	1
Total for S 3 — Add the points in the boxes above	3

Rating of Value If score is: **✓2-4 = H ___1 = M ___0 = L** *Record the rating on the first page*

Wetland name or number Wetland A

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows. Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	1

Rating of Site Potential If score is: ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	1

Rating of Landscape Potential If score is: ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately downgradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther downgradient points = 1 No flooding problems anywhere downstream points = 0	1
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	1

Rating of Value If score is: __ **2-4 = H** ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number Wetland A

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac. **2**

____Aquatic bed	4 structures or more: points = 4
____Emergent	3 structures: points = 2
☑ Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1
☑ Forested (areas where trees have > 30% cover)	1 structure: points = 0

If the unit has a Forested class, check if:

☑ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods **3**

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

☑ Permanently flooded or inundated	4 or more types present: points = 3
☑ Seasonally flooded or inundated	3 types present: points = 2
____Occasionally flooded or inundated	2 types present: points = 1
☑ Saturated only	1 type present: points = 0
☑ Permanently flowing stream or river in, or adjacent to, the wetland	
____Intermittently or seasonally flowing stream in, or adjacent to, the wetland	
____**Lake Fringe wetland**	**2 points**
____**Freshwater tidal wetland**	**2 points**

H 1.3. Richness of plant species **2**

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

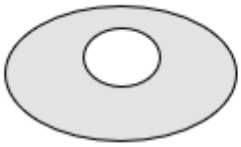
If you counted: > 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = 0

H 1.4. Interspersion of habitats **3**

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

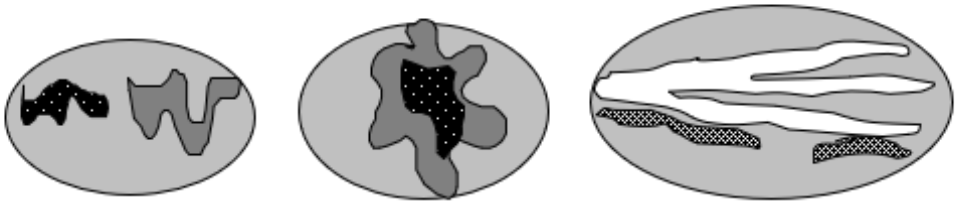


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



Wetland name or number Wetland A

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ✓ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ✓ Standing snags (dbh > 4 in.) within the wetland ✓ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ✓ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ✓ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ___ Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	5
Total for H 1 Add the points in the boxes above	15

Rating of Site Potential If score is: ✓ **15-18 = H** ___ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?		
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat ~~16%~~ **+** [(~~18%~~ moderate and low intensity land uses)/2] = ~~17%~~ Total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon 20-33% of 1 km Polygon 10-19% of 1 km Polygon < 10% of 1 km Polygon	7% Accessible + (31/2) 15.5% = 22.5% points = 3 points = 2 points = 1 points = 0	2
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat ~~20%~~ **+** [(~~18%~~ moderate and low intensity land uses)/2] = ~~22%~~ Total habitat > 50% of Polygon Total habitat 10-50% and in 1-3 patches Total habitat 10-50% and > 3 patches Total habitat < 10% of 1 km Polygon	20% Undist + (15.5%) = 35.5 (4 patches) points = 3 points = 2 points = 1 points = 0	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use ≤ 50% of 1 km Polygon is high intensity	High LUI = 42 points = (- 2) points = 0	0
Total for H 2 Add the points in the boxes above		~~3~~ 1

Rating of Landscape Potential If score is: ___ **4-6 = H** ✓ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ✓ It has 3 or more Priority Habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW Priority Species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: ✓ **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number Wetland A

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

✓ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number Wetland A

✓ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

✓ **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

✓ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number B

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland B Date of site visit: 3/25

Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___ No Date of training 10/06

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___ Y _X_ N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.

Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY ___II___ (based on functions ✓ or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

__X__**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	(H) M L	
Landscape Potential	H (M) L	H (M) L	H (M) L	
Value	(H) M L	H (M) L	(H) M L	**TOTAL**
Score Based on Ratings	7	6	8	21

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	✓

Wetland name or number B

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number B

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ✓ The wetland is on a slope (*slope can be very gradual*),
   ✓ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   X The water leaves the wetland **without being impounded**. (Dependant on beaver activity)

   NO – go to 5 **YES** - The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number B

NO – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number B

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	9

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? Yes = 2 No = 0	1
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: ✓ **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number B

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	8

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	0
Total for D 5 Add the points in the boxes above	1

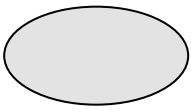
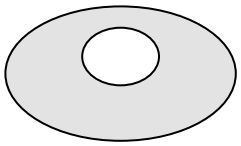
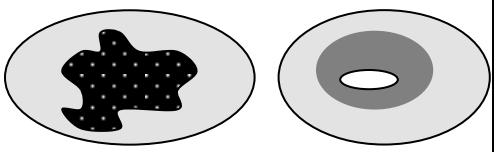
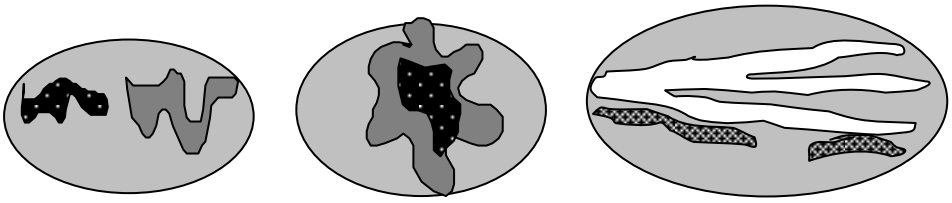
Rating of Landscape Potential If score is: ___ **3 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther down-gradient. points = 1 Flooding from groundwater is an issue in the sub-basin. points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland. points = 0	1
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	1

Rating of Value If score is: ___ **2-4 = H** ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number B

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* X Aquatic bed — 4 structures or more: points = 4 X Emergent — 3 structures: points = 2 X Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 X Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	4
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ____Permanently flooded or inundated — 4 or more types present: points = 3 X Seasonally flooded or inundated — 3 types present: points = 2 ____Occasionally flooded or inundated — 2 types present: points = 1 X Saturated only — 1 type present: points = 0 ____Permanently flowing stream or river in, or adjacent to, the wetland X Seasonally flowing stream in, or adjacent to, the wetland ____**Lake Fringe wetland** — **2 points** ____**Freshwater tidal wetland** — **2 points**	2
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	2
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points  **Low** = 1 point  **Moderate** = 2 points All three diagrams in this row are **HIGH** = 3points 	2

Wetland name or number B

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* X Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). X Standing snags (dbh > 4 in) within the wetland X Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* X At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* X Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	5
Total for H 1 Add the points in the boxes above	15

Rating of Site Potential If score is: ✓ **15-18 = H** ___ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon 7% Accessible + (31/2) 15.5% = 22.5% points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches 20% Undist + (15.5%) = 35.5 (4 patches) points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use High = 42% points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	0
Total for H 2 Add the points in the boxes above	3

Rating of Landscape Potential If score is: ___ **4-6 = H** ✓ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 X It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: ✓ **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number B

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

✓ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

✓ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes **–** Go to **SC 2.2** No **–** Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

Wetland name or number _____

This page left blank intentionally

The Reserve

Wetland Unit Map

Legend

Wetland A
Slope Wetland Unit
(Hydrology collects in small depressions throughout, seasonal sheet flow south over unit to Lacamas Creek, overbank flooding doesn't appear to extend over this full area).

Cowardin Plant Classes:
Forested
Scrub/Shrub
Dense Ridge Plant Cover

Hydroperiods:
Permanently flooded,
Seasonally flooded,
aturated Adjacent to
Permanently Flowing Stream
(Lacamas Creek)

Wetland B
Depressional Wetland Unit
(Ponding throughout, unidirectional flow southwest via stream channel, sits higher in elevation that the wetland to west).

Cowardin Plant Classes:
Aquatic
Emergent
Forested
Scrub/Shrub

Hydroperiods:
Seasonally flooded,
Saturated,
Adjacent to Seasonally Flowing Stream

NE 28th St
Goodwin Rd
Unit Break
Riverine Unit
(Due to overbank
flooding from Lacamas Cr)
Unit Break
Lacamas Church of God Campground
Lacamas Cr.
Unit Break
Riverine Unit
(Due to overbank
flooding from Lacamas Cr)
Keith Upkes Coaching
Barrett & Co. CPA's
Google Earth
Image © 2025 Maxar Technologies
639
1000 ft

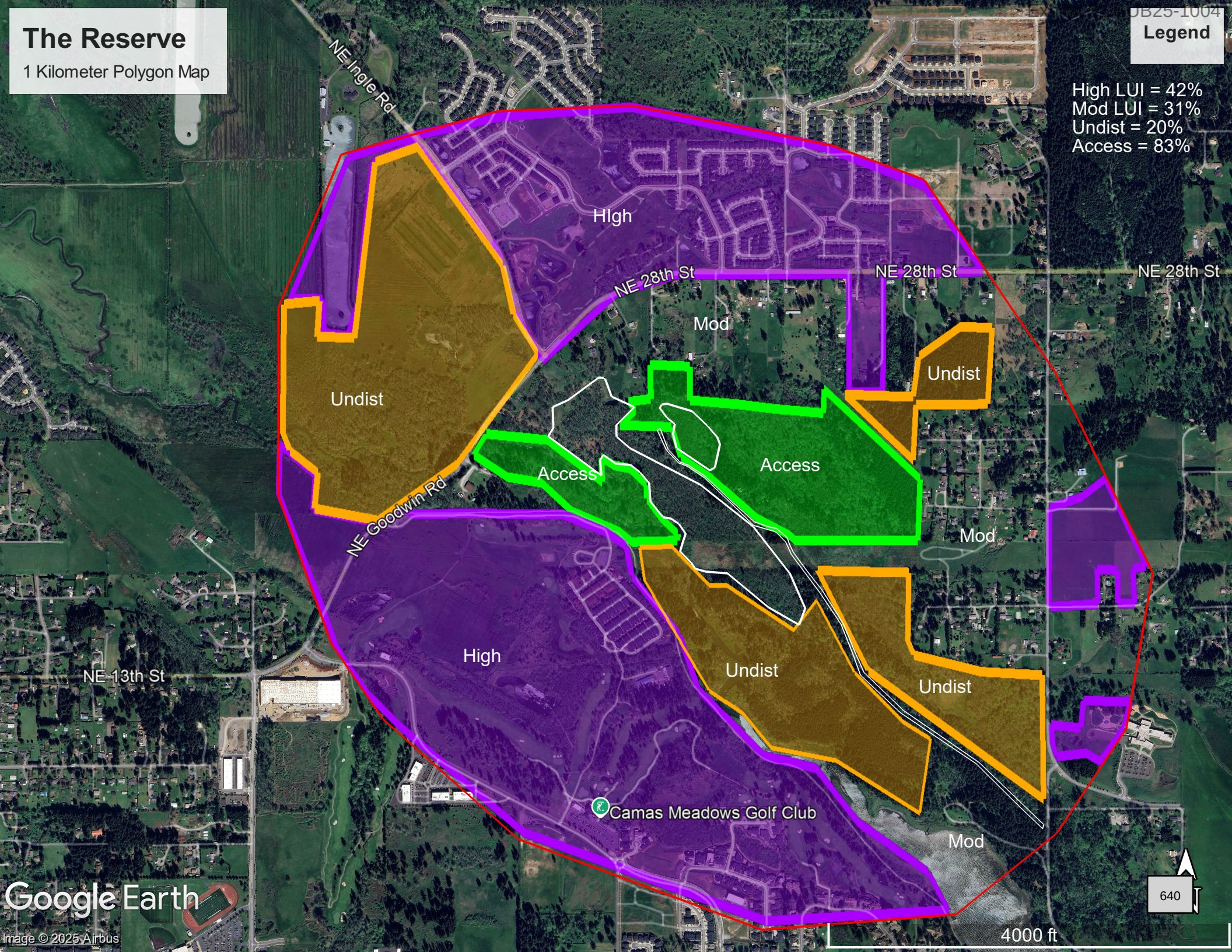
The Reserve

1 Kilometer Polygon Map

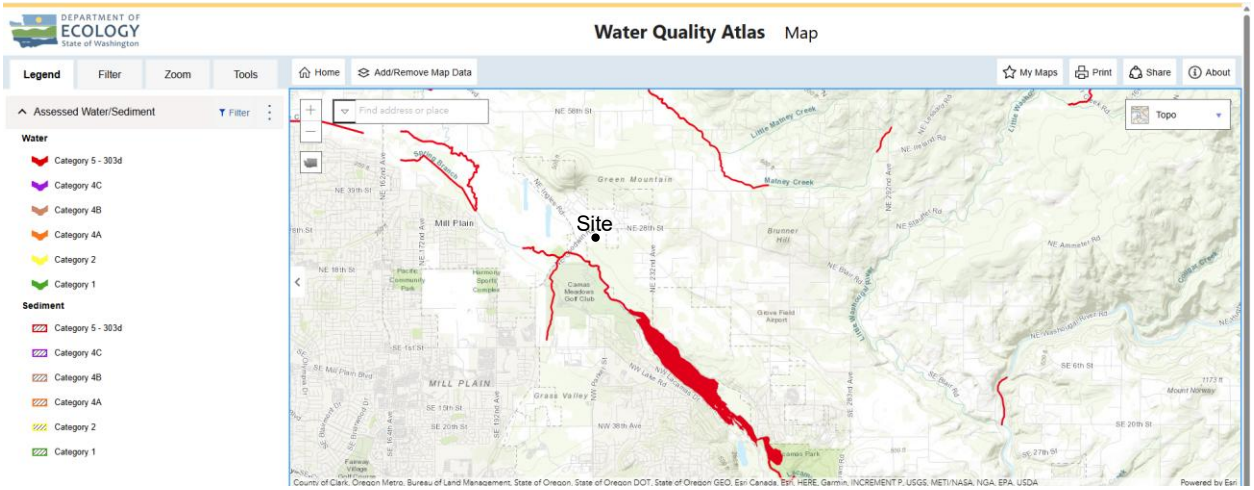
UB25-1004

Legend

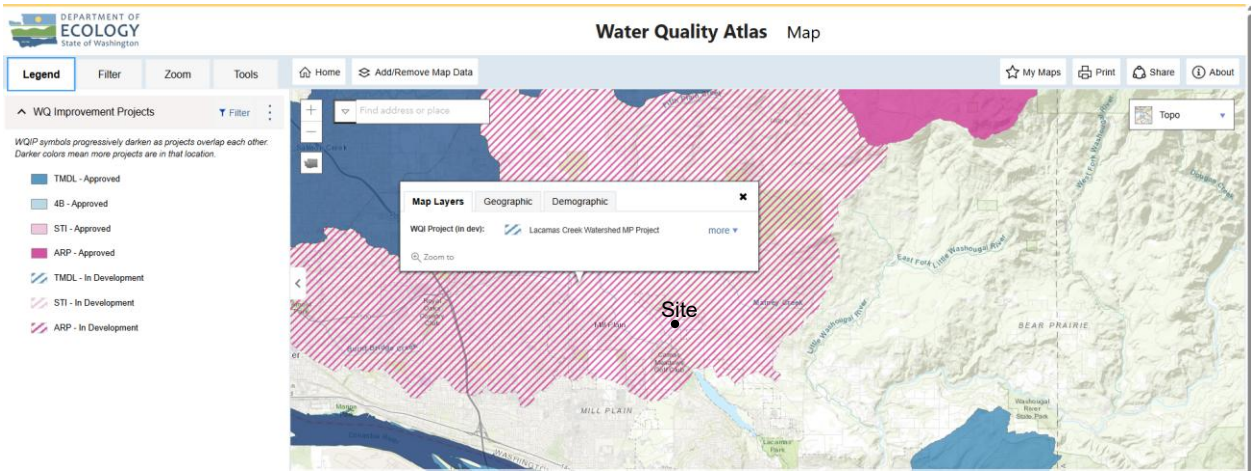
High LUI = 42%
Mod LUI = 31%
Undist = 20%
Access = 83%



The Reserve at Green Mt.
WRF Figure 3



↑Screen capture of map of 303(d) listed waters in basin (from Ecology website).



↑Screen capture of list of TMDLs for WRIA in which unit is found (from Ecology website).

Appendix D

Tree Plan (Map & Table)

EXISTING CONDITIONS SURVEY

IN THE NW 1/4 OF THE SW 1/4
SECTION 21, T. 2 N., R. 3 E., W.M.
CITY OF CAMAS
CLARK COUNTY WASHINGTON

JOB NO. 3927
DATA COLLECT: MARCH 2025
DRAWING DATE: 03-20-2025
SHEET 1 OF 1

LEGEND:

- INDICATES WATER VALVE
- INDICATES FIRE HYDRANT
- INDICATES WATER STAND PIPE
- INDICATES WELL
- INDICATES SANITARY SEWER MANHOLE
- INDICATES SEPTIC SYSTEM LID
- INDICATES POWER POLE WITH DIRECTION OF OVERHEAD LINES
- INDICATES GUY ANCHOR
- INDICATES ELECTRIC METER
- INDICATES TRANSFORMER
- INDICATES HEAT PUMP
- INDICATES GAS VALVE
- INDICATES SIGN
- INDICATES WETLAND FLAG
- INDICATES EVERGREEN TREE WITH TRUNK DIAMETER AND TYPE
- INDICATES DECIDUOUS TREE WITH TRUNK DIAMETER AND TYPE
- INDICATES FIBER OPTIC PEDESTAL
- INDICATES MAIL BOX
- INDICATES BOUNDARY
- INDICATES EDGE OF ASPHALT
- INDICATES EDGE OF CONCRETE
- INDICATES EDGE OF GRAVEL
- INDICATES 5 FOOT INTERVAL CONTOUR
- INDICATES 1 FOOT INTERVAL CONTOUR
- INDICATES FENCE LINE
- INDICATES EDGE OF WATER
- INDICATES PAVE STRIPE
- INDICATES OVERHEAD POWER
- INDICATES TREE DRIP LINE

SCALE 1 INCH = 60 FEET

PLS ENGINEERING

Engineering · Surveying · Planning
604 W. Evergreen Blvd., Vancouver, WA 98660
PH: (360) 944-6519 FAX: (360) 944-6539

NOTES:

1. THE PURPOSE OF THIS HYDED DRAWN FOR PLAT SURVEY DISCUSION AND ADVANTAGES FOUND. THIS IS NOT INTENDED TO BE A BOUNDARY SURVEY. NO PROPERTY CORNERS WERE SET IN THIS SURVEY.
2. NO WARRANTIES ARE MADE AS TO MATTERS OF UNWRITTEN TITLE, SUCH AS ADVERSE POSSESSION, ESTOPPEL, ACQUIESCENCE, ETC.
3. A PRIVATE UTILITY LOCATE WAS CALLED FOR ON 03-26-2025. THE UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE ONLY. UNDERGROUND CONNECTIONS ARE SHOWN AS LOCATIONS SHOWN ARE APPROXIMATE ONLY. UNDERGROUND CONNECTIONS ARE SHOWN AS PAINTED ON THE GROUND AT THE TIME OF SURVEY. ALL UTILITIES MAY NOT BE SHOWN. SOME UNDERGROUND LOCATIONS HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. M.G.S. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS.

HORIZONTAL DATUM:
NAD 83 (2011)
WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, U.S. SURVEY FEET, BASED ON REAL TIME KINEMATIC CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK.

VERTICAL DATUM:
NGVD29(47) CLARK COUNTY DATUM, DERIVED BY WSRN OBSERVATIONS. NAVD88) TO NGVD 29(47)=-3.21'

EXISTING CONDITIONS SURVEY

IN THE NW 1/4 OF THE SW 1/4
SECTION 21, T. 2 N., R. 3 E., W.M.
CITY OF CAMAS
CLARK COUNTY WASHINGTON

JOB NO.: 3927
DATA COLLECT: MARCH 2025
DRAWING DATE: 03-20-2025
SHEET 1 OF 1

Point Table	
Point #	Raw Description
10937	7"TRD
10938	9"FIR
10943	11"CHERRY
10944	25"FIR
10945	24"FIR
10948	14"FIR
10949	22"FIR
10951	19"FIR
10952	22"FIR
10954	29"FIR
10960	22"FIR
10961	29"FIR
10964	10"FIR
10965	10"FIR
10967	23"FIR
10968	29"FIR
10969	34"FIR
10970	30"FIR
10971	26"FIR
10972	26"FIR
10973	36"FIR
10975	28"FIR
10976	29"FIR
10977	13"FIR
10979	14"FIR
10980	18"FIR
11036	20"FIR
11038	15"FIR
11040	36"FIR
11041	23"FIR
11043	7"FIR
11044	20"FIR
11047	19"FIR
11054	40"FIR
11058	19"FIR
11090	29"FIR
11103	15"FIR
11116	21"FIR
11117	7"FIR
11118	24"FIR

Point Table		
Point #	Raw Description	
11129	7"TRD	
11130	21"FIR	
20023	12"FIR	
20024	10"FIR	
20041	16"TRD	
20059	8"TRD	
20060	15"TRD	
20114	19"FIR	
20115	22"FIR	
20117	22"FIR	
20118	21"FIR	
20119	19"FIR	
20120	12"FIR	
10974	24"WHITE OAK	
10978	19"WHITE OAK X2 SHARED TRUNK	<20" DBH
11060	23"WHITE OAK	
11064	29"WHITE OAK	
11094	18"WHITE OAK	<20" DBH
11119	18"WHITE OAK	<20" DBH
11120	23"WHITE OAK	
11133	43"WHITE OAK	
20025	24"WHITE OAK	
20045	24"WHITE OAK	
20052	28"WHITE OAK	
20070	11"WHITE OAK	<20" DBH
20076	11"WHITE OAK	<20" DBH
20082	18"WHITE OAK	<20" DBH
20092	10"WHITE OAK	<20" DBH
20093	11"WHITE OAK	<20" DBH
20098	14"WHITE OAK	<20" DBH
20113	29"WHITE OAK	
11048	8"WHITE PINE	

Point Table		
Point #	Raw Description	
20301	14"FIR	
20303	18"FIR	
20304	17"FIR	
20305	15"FIR	
20277	7"TRD	
20278	39"FIR	
20279	33"FIR	
20280	37"FIR	
20281	36"WHITE OAK	
20283	27"FIR	
20284	22"FIR	
20290	25"WHITE OAK	
20296	27"FIR	
20297	24"FIR	
20298	18"FIR	
20299	26"FIR	
20300	18"FIR	
20306	18"FIR	
20307	32"FIR	
20308	26"FIR	
20309	22"FIR	
20310	23"FIR	
20311	17"FIR	
20312	22"FIR	
20313	23"FIR	
20314	12", 14", 14", 18" WHITE OAK SHARE TRUNK	
20319	12"FIR	
20320	8"FIR	
20321	18"FIR	
20322	19"FIR	
20323	8"FIR	
20324	9"FIR	
20325	28"FIR	
20326	27"FIR	
20327	21", 17" WHITE OAK SHARED TRUNK	
20328	9", 6" WHITE OAK SHARED TRUNK	<20" DBH
20285	13" WHITE OAK	<20" DBH
20302	17"FIR	<20" DBH
20338	19" WHITE OAK	<20" DBH
20343	22"WHITE OAK	

Point Table	
Point #	Raw Description
20344	29"FIR
20353	21"WHITE OAK
20354	25"WHITE OAK
20355	22"WHITE OAK
20356	23"WHITE OAK
20362	20"FIR
20363	37"FIR
20364	19"FIR
20498	12"CEDAR
20499	10", 6" CEDAR
20500	9"CEDAR
20501	10"CEDAR
20502	10"CEDAR
20503	10"CEDAR
20504	10"CEDAR
20505	10"CEDAR
20506	12"CEDAR
20507	11"CEDAR
20508	12"CEDAR
20509	12"CEDAR
20510	12"CEDAR
20511	11"CEDAR
20512	15"CEDAR
20513	13"CEDAR
20514	14"CEDAR
20515	12", 6" CEDAR
20516	15"CEDAR
20517	16"CEDAR
10957	25"FIR
10913	25"FIR
10915	20"FIR
10917	22"FIR
10921	27"FIR
10922	13"TRD
10925	27"FIR
10929	35"FIR
10930	11"FIR
10931	24"FIR
10934	20"FIR
10935	28"FIR

LEGEND:

- WV — INDICATES WATER VALVE
- FIRE HYDRANT — INDICATES FIRE HYDRANT
- WATER STAND PIPE — INDICATES WATER STAND PIPE
- W — INDICATES WELL
- S — INDICATES SANITARY SEWER MANHOLE
- SEPTIC — INDICATES SEPTIC SYSTEM LID
- PP — INDICATES POWER POLE WITH DIRECTION OF OVERHEAD LINES
- GUY ANCHOR — INDICATES GUY ANCHOR
- ELEC METER — INDICATES ELECTRIC METER
- TRANSFORMER — INDICATES TRANSFORMER
- HP GV — INDICATES HEAT PUMP
- GAS VALVE — INDICATES GAS VALVE
- SIGN — INDICATES SIGN
- WETLAND FLAG — INDICATES WETLAND FLAG
- EVERGREEN TREE — INDICATES EVERGREEN TREE WITH TRUNK DIAMETER AND TYPE
- DECIDUOUS TREE — INDICATES DECIDUOUS TREE WITH TRUNK DIAMETER AND TYPE
- FIBER OPTIC PEDESTAL — INDICATES FIBER OPTIC PEDESTAL
- MB — INDICATES MAIL BOX

- INDICATES BOUNDARY
- INDICATES EDGE OF ASPHALT
- INDICATES EDGE OF CONCRETE
- INDICATES EDGE OF GRAVEL
- INDICATES 5 FOOT INTERVAL CONTOUR
- INDICATES 1 FOOT INTERVAL CONTOUR
- INDICATES FENCE LINE
- INDICATES EDGE OF WATER
- INDICATES PAINT STRIPE
- OHP — INDICATES OVER HEAD POWER
- INDICATES TREE DRIP LINE

Note: Tree survey reflects
16 jurisdictional Oregon white oak
present onsite (>20" DBH).

The project will retain all 16 Oregon white oak.

ADAM B. THOMSON — STATE OF WASHINGTON — 21032302 — REGISTERED PROFESSIONAL LAND SURVEYOR

HORIZONTAL DATUM:
NAD 83 (2011)
WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, U.S SURVEY FEET. BASED ON REAL TIME KINEMATIC CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK.

VERTICAL DATUM:
NGVD29(47) CLARK COUNTY DATUM, DERIVED BY WSRN OBSERVATIONS, NAVD(88) TO NGVD 29(47)=-3.21'

NOTES:
1. BOUNDARIES WERE DRAWN PER PLAT. SURVEY RECORDS AND MONUMENTS FOUND. THIS IS NOT INTENDED TO BE A BOUNDARY SURVEY. NO PROPERTY CORNERS WERE SET IN THIS SURVEY.

2. NO WARRANTIES ARE MADE AS TO MATTERS OF UNWRITTEN TITLE, SUCH AS ADVERSE POSSESSION, ESTOPPEL, ACQUIESCENCE, ETC.

3. A PRIVATE UTILITY LOCATE WAS CALLED FOR ON 03-26-2025. THE UNDERGROUND UTILITIES AS SHOWN HEREON ARE AS MARKED AT THE TIME OF THIS SURVEY. UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE ONLY. UNDERGROUND CONNECTIONS ARE SHOWN AS STRAIGHT LINES BETWEEN SURFACE LOCATIONS BUT MAY CONTAIN BENDS OR CURVES NOT SHOWN. SOME UNDERGROUND LOCATIONS HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. M.G.S. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS.

60 30 0 60 90 120
SCALE 1 INCH = 60 FEET

PLS ENGINEERING
Engineering - Surveying - Planning
604 W. Evergreen Blvd., Vancouver, WA 98660
PH: (360) 944-6519 Fax: (360) 944-6539

Exhibit 21 SUB25-1004





Legend

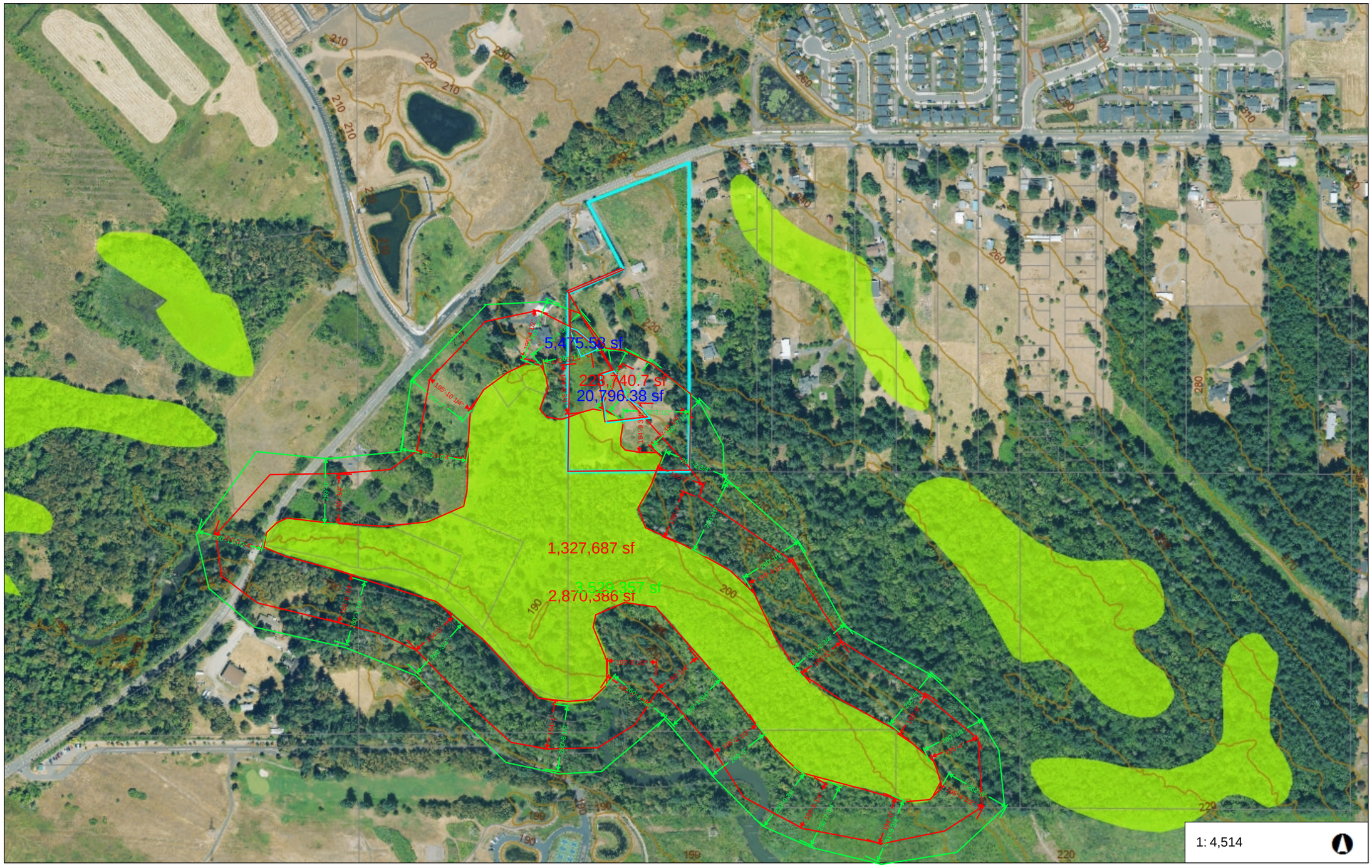
- Taxlots
- Contours Lines - 2 ft
- Contour Lines - 10 ft

Notes:

0.1 0 0.07 0.1 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Taxlot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.





Legend

- Taxlots
- Contour Lines - 10 ft
- NWI Wetland

Notes:

646

0.1 0 0.07 0.1 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Taxlot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

September 2, 2025

Pacific Lifestyle Homes
Attn: Lisa Harker
Sent via email: pm@plsengineering.com

RE: Technically Complete Letter for Planning Case SUB25-1004 - "The Reserve at Green Mountain"

Dear Ms. Harker,

The purpose of this letter is to inform you that the above application submitted on July 14, 2025, has been deemed technically complete in accordance with Camas Municipal Code (CMC) Section 18.55.130.

Staff will begin reviewing the application and will contact you if there are any questions or comments. If you have any questions, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,

Yvette Sennewald, Senior Planner

Exhibit 23 SUB25-1006

Notice of Proposed Development

"The Landing at Green Mountain 2"

An application is on file with the City of Camas for review of a *"Type III Subdivision application to establish proposed use"*. For information regarding this project contact:

Applicant Contact:
Nick Edwards
(360) 597-7098
NickE@buildplh.com

City Contact:
Yvette Sennewald
(360) 817-1568
YSennewald@cityofcamas.us



Public Hearing Schedule:

Hearing Date/Time: December 9th, 2025 5:00 PM

Hearing Location: Camas City Hall Council Chambers

In re: Reserve at Green Mountain

) NO. SUB25-1004
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on October 8, 2025, I directed a true and correct copy of the Notice of Application be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 9th day of October, 2025.

Aireanna Baldwin
Notary Public
State of Washington
My Appointment Expires 10/1/2028
Commission Number 183848

Aireanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2028

HAWRYLO ROBERT S II & HAWRYLO LIDIA TRUSTEES
16758 LA MAIDA ST
ENCINO, CA 91436

FREESE THAD V & FREESE SALLY KAYE TRUSTEES
2521 NE GOODWIN RD
CAMAS, WA 98607

HAWRYLO ROBERT S II & HAWRYLO LIDIA TRUSTEES
16758 LA MAIDA ST
ENCINO, CA 91436

TERRELL & ASSOC LLC ETAL
17933 NW EVERGREEN PL STE 300
BEAVERTON, OR 97006

CHADWICK STEPHANIE L & CHADWICK SCOTT
2619 NE GOODWIN RD
CAMAS, WA 98607

COBURN JAMES A
21715 NE 28TH ST #A
CAMAS, WA 98607

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

PACIFIC POWER & LIGHT COMPANY
825 NE MULTNOMAH STE 1900
PORTLAND, OR 97232

BAHU MARWAN A
212 SOWING OAK DR
SAN MARCOS, TX 78666

SHELDON BARBARA J & MULLINS BRIAN K
21731 NE 28TH ST
CAMAS, WA 98607

COBURN JAMES A
21715 NE 28TH ST
CAMAS, WA 98607

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

FREESE THAD V & FREESE SALLY KAYE TRUSTEES
2521 NE GOODWIN RD
CAMAS, WA 98607

CITY OF CAMAS
616 NE 4TH AVE
CAMAS, WA 98607

NOTICE OF APPLICATION
The Reserve at Green Mountain

(Planning Case Number: SUB25-1004)

Consolidated Files: State Environmental Policy Act, Archaeological and Critical Area Review

NOTICE IS HEREBY GIVEN that an application for the "Reserve at Green Mountain", a 38-lot subdivision was received on May 28, 2025, and deemed technically complete on September 2, 2025. A public hearing is required for the development proposal and will be scheduled at a later date. A separate public hearing notice will be mailed to all property owners within 300-feet of the subject development and published in the Post Record.

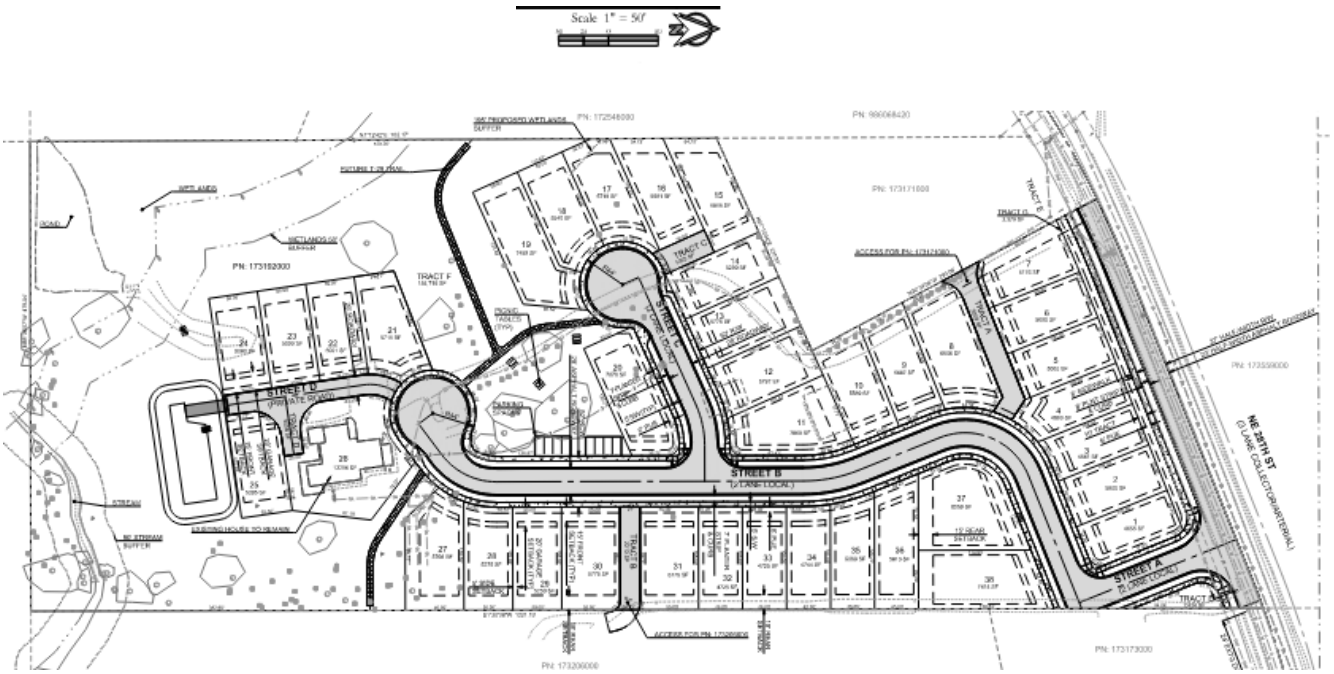
Location: The approximately 11.3-acre site is zoned Single-Family Residential (R-7.5) in the City of Camas. The site is located at 2625 NE Goodwin Road in the SW ¼ of Section 21 Township 2 North, Range 3 East, Camas, WA, Parcel Number: 173192000

Application Materials: The application included the following: project narrative, SEPA checklist, preliminary development plans, preliminary stormwater report, critical areas report, preliminary geotechnical report, preliminary landscape plan, tree plan, archeological pre-determination report, mailing labels, title report and traffic study. Application materials are available for review from the Community Development Department during regular business hours Monday – Friday 8am-5pm.

Questions/Comments: For questions related to this application, please contact Yvette Sennewald, Senior Planner, at (360) 817-1568 or by email at communitydevelopment@cityofcamas.us.

Published in the Post Record on October 9, 2025 Legal Publication # 1040940
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on October 8, 2025

Preliminary Plat for The Reserve at Green Mountain (SUB25-1004)



NOTICE OF APPLICATION
The Reserve at Green Mountain
(Planning Case Number: SUB25-1004)

Consolidated Files: State Environmental Policy Act, Archaeological and Critical Area Review

NOTICE IS HEREBY GIVEN that an application for the "Reserve at Green Mountain", a 38-lot subdivision was received on May 28, 2025, and deemed technically complete on September 2, 2025. A public hearing is required for the development proposal and will be scheduled at a later date. A separate public hearing notice will be mailed to all property owners within 300-feet of the subject development and published in the Post Record.

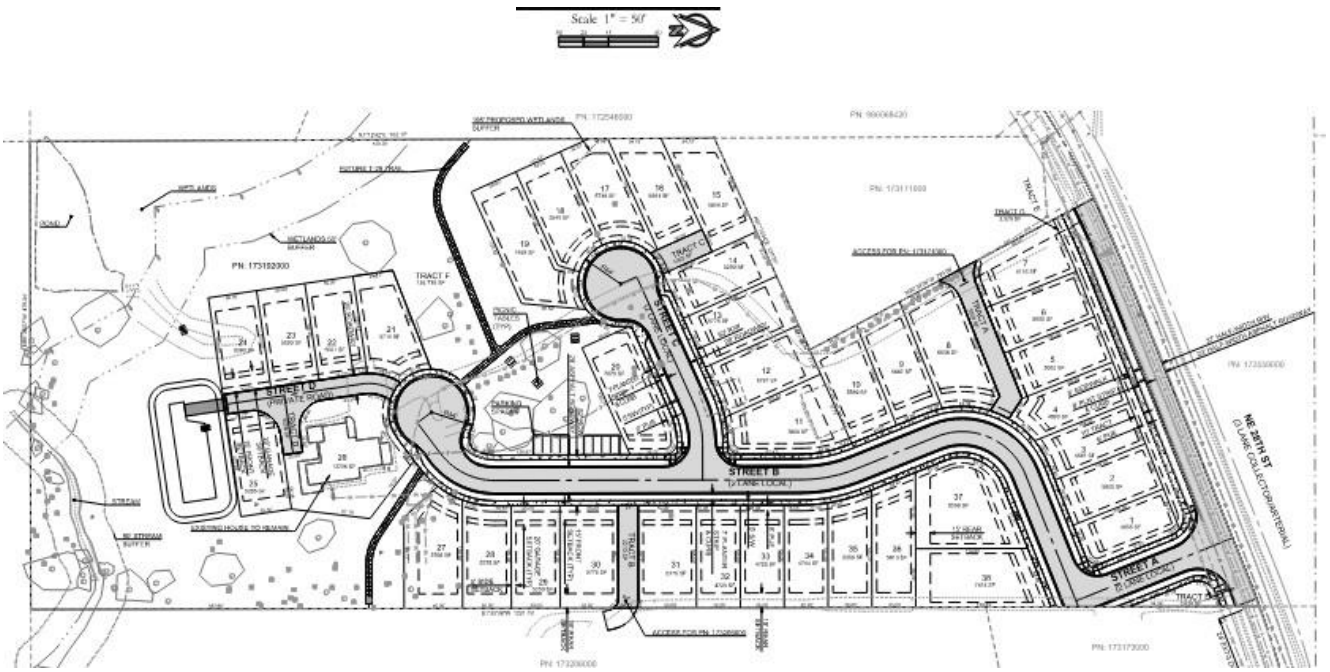
Location: The approximately 11.3-acre site is zoned Single-Family Residential (R-7.5) in the City of Camas. The site is located at 2625 NE Goodwin Road in the SW ¼ of Section 21 Township 2 North, Range 3 East, Camas, WA, Parcel Number: 173192000

Application Materials: The application included the following: project narrative, SEPA checklist, preliminary development plans, preliminary stormwater report, critical areas report, preliminary geotechnical report, preliminary landscape plan, tree plan, archeological pre-determination report, mailing labels, title report and traffic study. Application materials are available for review from the Community Development Department during regular business hours Monday – Friday 8am-5pm.

Questions/Comments: For questions related to this application, please contact Yvette Sennewald, Senior Planner, at (360) 817-1568 or by email at communitydevelopment@cityofcamas.us.

Published in the Post Record on October 9, 2025 Legal Publication # 1040940
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on October 8, 2025

Preliminary Plat for The Reserve at Green Mountain (SUB25-1004)



In re: Reserve at Green Mountain

) NO. SUB25-1004
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on October 15, 2025, I directed a true and correct copy of the SEPA Determination of Non-Significance be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 16th day of October, 2025.

Alreanna Baldwin
Notary Public
State of Washington
My Appointment Expires 10/1/2028
Commission Number 183848

Alreanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2028

HAWRYLO ROBERT S II & HAWRYLO LIDIA TRUSTEES
16758 LA MAIDA ST
ENCINO, CA 91436

FREESE THAD V & FREESE SALLY KAYE TRUSTEES
2521 NE GOODWIN RD
CAMAS, WA 98607

HAWRYLO ROBERT S II & HAWRYLO LIDIA TRUSTEES
16758 LA MAIDA ST
ENCINO, CA 91436

TERRELL & ASSOC LLC ETAL
17933 NW EVERGREEN PL STE 300
BEAVERTON, OR 97006

CHADWICK STEPHANIE L & CHADWICK SCOTT
2619 NE GOODWIN RD
CAMAS, WA 98607

COBURN JAMES A
21715 NE 28TH ST #A
CAMAS, WA 98607

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

PACIFIC POWER & LIGHT COMPANY
825 NE MULTNOMAH STE 1900
PORTLAND, OR 97232

BAHU MARWAN A
212 SOWING OAK DR
SAN MARCOS, TX 78666

SHELDON BARBARA J & MULLINS BRIAN K
21731 NE 28TH ST
CAMAS, WA 98607

COBURN JAMES A
21715 NE 28TH ST
CAMAS, WA 98607

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

FREESE THAD V & FREESE SALLY KAYE TRUSTEES
2521 NE GOODWIN RD
CAMAS, WA 98607

CITY OF CAMAS
616 NE 4TH AVE
CAMAS, WA 98607

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SUB25-1004 The Reserve at Green Mountain

APPLICANT: PLS Engineering
604 W. Evergreen Boulevard
Vancouver, WA 98660

REQUEST: To subdivide approximately 11.3 acres situated in the R-7.5 – Single-Family Residential Zone into 38-lots to facilitate the future development of single-family detached residential homes.

LOCATION: 2625 NE GOODWIN ROAD
PARCEL NUMBER 173192000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE SW ¼ OF SECTION 21 TOWNSHIP 2 NORTH, RANGE 3 EAST

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: OCTOBER 30, 2025, AT 5:00 P.M.

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on October 16, 2025 Legal Publication #142050
Mailed to property owners within 300-feet on October 15, 2025
Posted on bulletin boards at Camas City Hall, Camas Library and the City of Camas web site at: http://www.cityofcamas.us

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **October 16, 2025**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **October 30, 2025**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

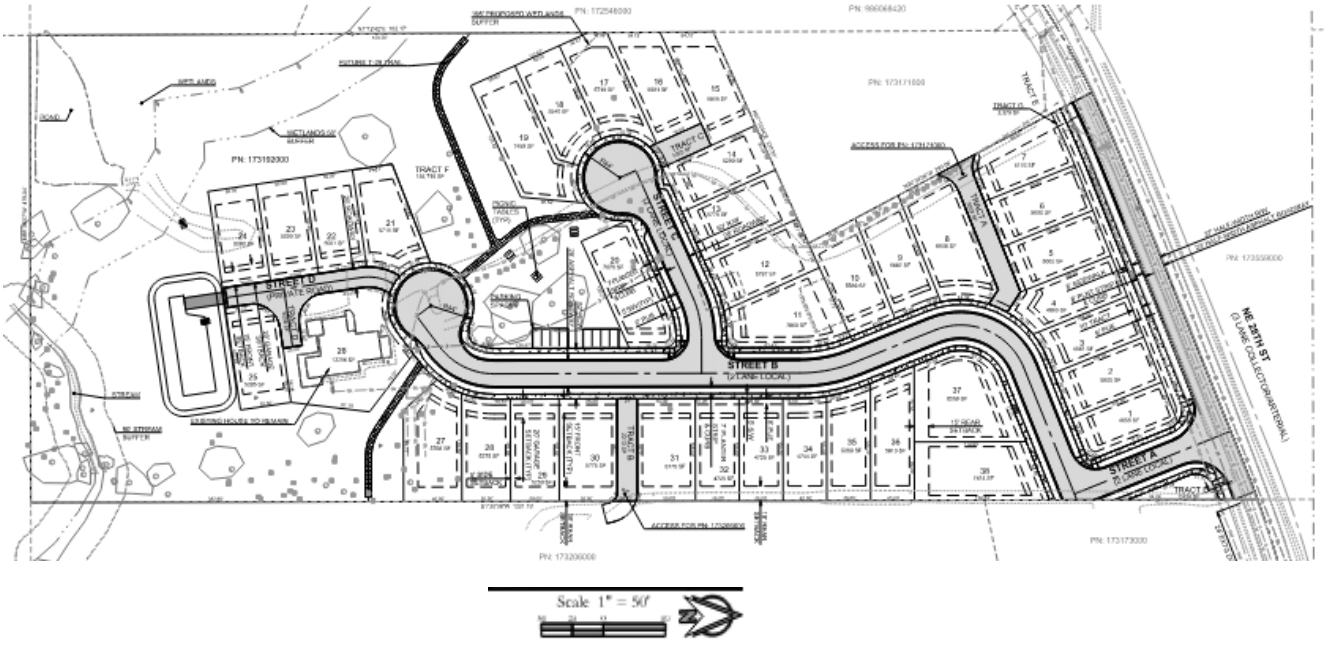
Responsible Official: Robert Maul (360) 817-1568



Robert Maul, Planning Manager and Responsible Official

October 16, 2025
Date of publication

Preliminary Plat for The Reserve at Green Mountain (SUB25-1004)



State Environmental Policy Act
Determination of Non-Significance

CASE NO: SUB25-1004 The Reserve at Green Mountain

APPLICANT: PLS Engineering
604 W. Evergreen Boulevard
Vancouver, WA 98660

REQUEST: To subdivide approximately 11.3 acres situated in the R-7.5 – Single-Family Residential Zone into 38-lots to facilitate the future development of single-family detached residential homes.

LOCATION: 2625 NE GOODWIN ROAD
PARCEL NUMBER 173192000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE SW ¼ OF SECTION 21 TOWNSHIP 2 NORTH, RANGE 3 EAST

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: OCTOBER 30, 2025, AT 5:00 P.M.

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on October 16, 2025 Legal Publication #142050
Mailed to property owners within 300-feet on October 15, 2025
Posted on bulletin boards at Camas City Hall, Camas Library and the City of Camas web site at: http://www.cityofcamas.us

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **October 16, 2025**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **October 30, 2025**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

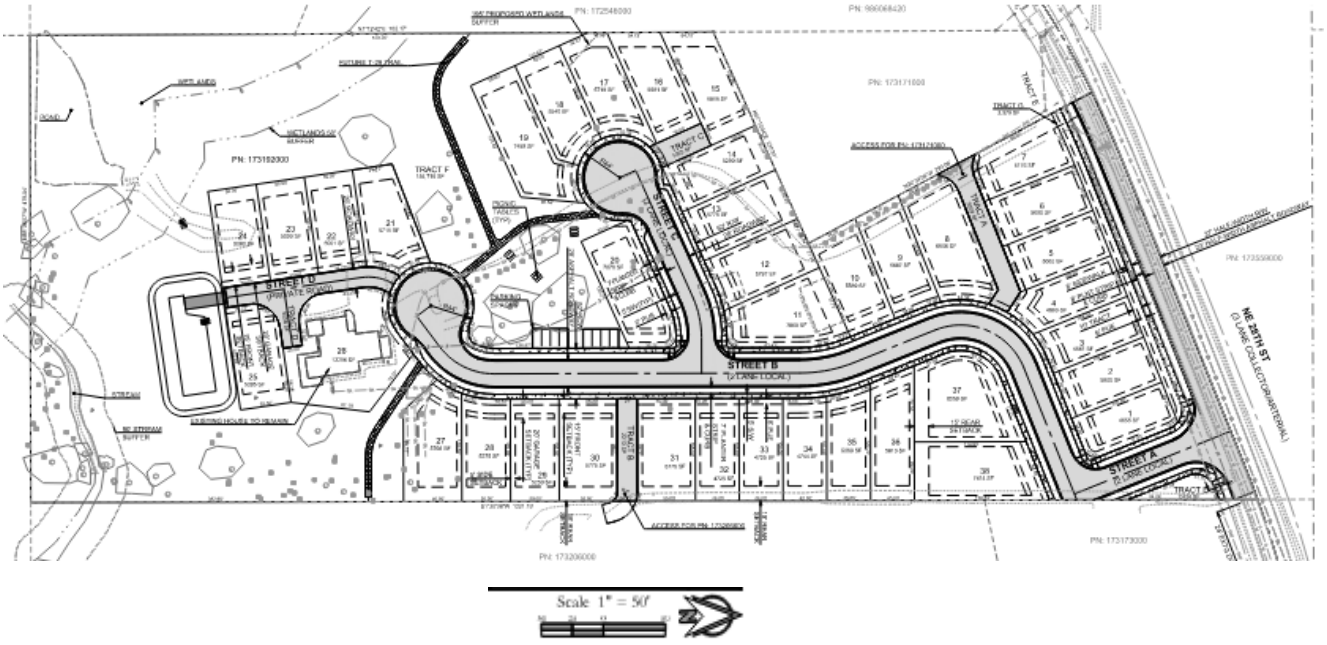
City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official

October 16, 2025
Date of publication

Preliminary Plat for The Reserve at Green Mountain (SUB25-1004)



COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

Date Published: October 16, 2025

To Whom It May Concern:

Please find enclosed a Determination of Non-Significance (DNS) for **The Reserve at Green Mountain (SUB25-1004)** that was issued pursuant to the State Environmental Policy Act (SEPA) Rules, Chapter 197-11, Washington Administrative Code. The enclosed review comments reflect evaluation of the environmental checklist by the lead agency as required by WAC 197-11-330(1)(a)(i).

The following materials were submitted with the initial application:

- General application form and fee
- Applicant's narratives
- Development plans and elevations
- Traffic Report
- Tree Survey
- SEPA Checklist
- Critical Areas Report
- Preliminary Stormwater Report
- Geotechnical Report
- Easements
- Cost Estimate
- Archaeological Predetermination*

All application materials are available for review upon request from the Community Development Department. *Archaeological information is exempt from public disclosure, consistent with RCW 42.56.300.

Written comments may be submitted on this determination within fourteen (14) days of its issuance, after which the DNS will be reconsidered in light of the comments received.

Please address all correspondence to:
City of Camas, SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607
communitydevelopment@cityofcamas.us

Distribution:

Applicant
C-Tran
Camas School District
Camas Building Official, Brian Smith
Camas Engineering Department Managers and Staff
Camas Fire Department, Randy Miller
Camas Finance Director, Cathy Huber Nickerson
Camas Community Development Director, Alan Peters
Camas Mayor and City Council Members
Camas Parks and Recreation Director, Chris Witkowski
Camas Planning Manager and Staff
Camas Police Chief, Tina Jones
Camas Public Works Director, Scott Collins
Camas Public Library, Connie Urquhart
Camas-Washougal Post Record
Chinook Indian Nation
Cultural Resource Program, Cowlitz Indian Tribe
Cultural Resource Program, Yakama Indian Nation
Clark County Department of Environmental Services
Clark County Department of Transportation
Clark County Natural Resources Council
Clark Public Utilities
Department of Ecology
Department of Fish and Wildlife, Region 5
Department of Natural Resources, SEPA Center
Southwest Clean Air Agency
US Army Corps of Engineers
Vancouver - Clark Parks & Recreation
Washington Office of Archaeology & Historic Preservation
Washington State Department of Transportation
Washington State Parks and Recreation Commission, Environmental Program
Property Owners within 300 feet *(mailed the SEPA Determination & map)*

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SUB25-1004 The Reserve at Green Mountain

APPLICANT: PLS Engineering
604 W. Evergreen Boulevard
Vancouver, WA 98660

REQUEST: To subdivide approximately 11.3 acres situated in the R-7.5 – Single-Family Residential Zone into 38-lots to facilitate the future development of single-family detached residential homes.

LOCATION: 2625 NE GOODWIN ROAD
PARCEL NUMBER 173192000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE SW ¼ OF SECTION 21 TOWNSHIP 2 NORTH, RANGE 3 EAST

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: OCTOBER 30, 2025, AT 5:00 P.M.

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on October 16, 2025 Legal Publication #142050
Mailed to property owners within 300-feet on October 15, 2025
Posted on bulletin boards at Camas City Hall, Camas Library and the City of Camas web site at: http://www.cityofcamas.us

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **October 16, 2025**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **October 30, 2025**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

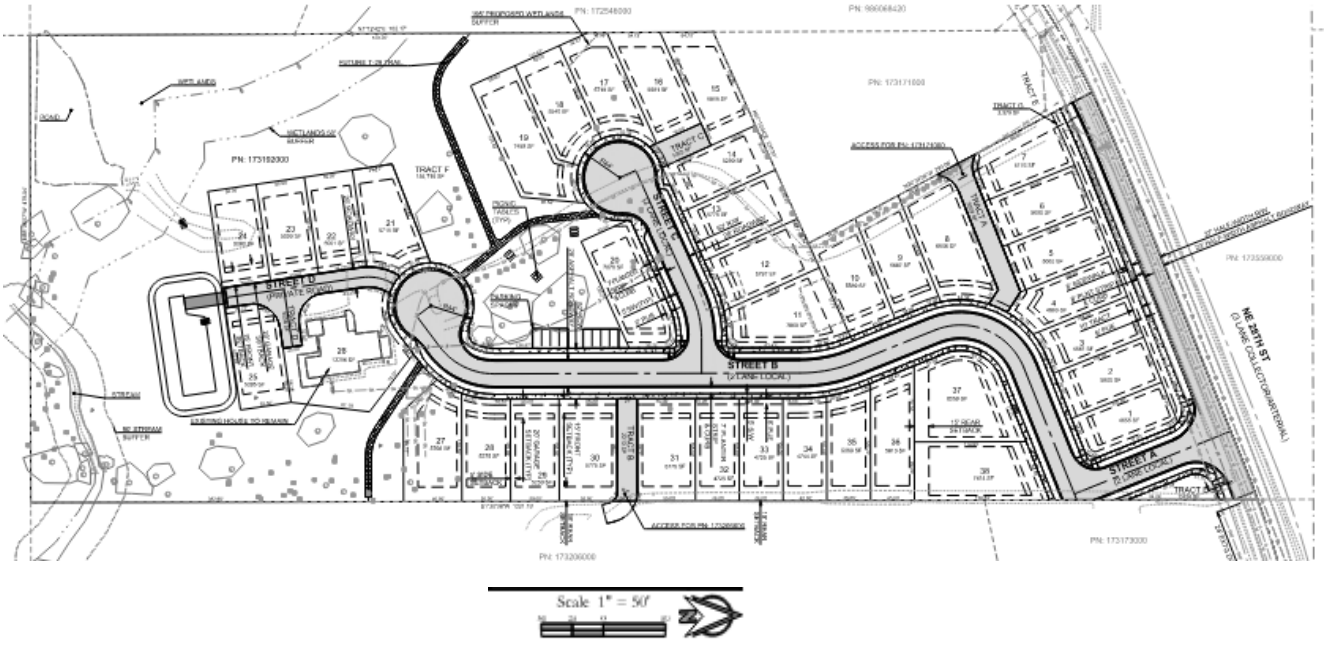
City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official

October 16, 2025
Date of publication

Preliminary Plat for The Reserve at Green Mountain (SUB25-1004)



Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

Reserve at Green Mountain Subdivision

2. Name of applicant: [help]

Pacific Lifestyle Homes – Nick Edwards

3. Address and phone number of applicant and contact person: [help]

11815 NE 99th Street Suite 1200
Vancouver, WA 98682
360-597-7098

4. Date checklist prepared: [help]

April 16, 2025

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval, likely in early 2026. No phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical Areas Report and Mitigation Plan

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No, the applicant is not aware of any other applications pending for governmental approvals that affect this site.

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type III Subdivision Review*
- *Public notification and staff report publications*
- *Hearing Examiner's Decision*
- *Final engineering plan review and approval*

- *Final Plat Approval*
- *SEPA*
- *SWWPPP - Stormwater Pollution Prevention Plan*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes a 38-lot single family residential subdivision in the R-7.5 zone on 11.31 acres. Public roads will be constructed that will connect into NE 28th Street and end in a cul-de-sac at the south end of the site.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 2625 NE Goodwin Rd. Camas, WA 98607, in the SW 1/4 of Section 21, Township 2 North, Range 3 East of the Willamette Meridian. The site is identified as Tax Parcel 173192000. See the proposed development plans for a preliminary plat, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

10%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site consists of:
CvA – Cove silty clay loam (0-3% slopes)
DoB – Dollar loam (0-5% slopes)
LrC – Lauren gravelly loam (3-15% slopes)
MlA – McBee silt loam (0-3% slopes)

It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of public roads, driveways, the installation of utilities, and the preparation of the site for single family residential housing. Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time; these will be established with the Final Engineering Plans.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 50%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal household activities, possibly including wood burning stoves and fireplaces.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are off-site sources of emissions from cars that travel adjacent roads. This will not affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

Per the Critical Areas Report for the site there is an onsite Category II wetland along the west portion of the property as well as an offsite Category II wetland southeast of the site. There is an un-named non-fish bearing stream in the southeast corner of the site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

Yes, the stormwater facility and portions of lots 21-25 and a shared private drive will be located within 200' of the waters.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

None, no impacts are proposed to the wetland or stream.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. A storm detention pond is proposed with the site development that will discharge stormwater into the nearby wetland. Storm water from pollution generating surfaces will be treated prior to being routed to the storm detention pond.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural;

etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will be runoff from impervious roof area, driveways, roadways, and landscaped areas. Street catch basins, yard drains, and roof drains will connect to a pipe network that leads to the detention pond.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

The contractor will be required to use approved erosion control measures during all phases of development in order to reduce or control runoff.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, maple, aspen, **other: Oregon white oak, ash, hazelnut**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
____ grass
x pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
x other types of vegetation: **blackberry, vine maple, snowberry, dogwood, salmonberry, sword fern, piggy-back plant, lanceleaf spring beauty, dovefoot geranium, large leaf avens, slough sedge.**

b. What kind and amount of vegetation will be removed or altered? [help]

Much of the site vegetation will be stripped for site preparation. Trees along the south portion of the site are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There are priority habitat Oregon white oaks onsite.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Street trees and landscaping will be provided throughout the park and open space areas. All Oregon white oaks will be preserved.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:
birds: **hawk**, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other: fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The future homes will likely be landscaped with grass lawns and appealing native shrubs and trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The new homes on the site will be served primarily by electricity and natural gas. Wood stoves might be used for heating. Other forms of energy will depend on homeowners.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The new homes will have energy-efficient windows and will comply with the state building codes which includes conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

There are no known environmental health hazards that could occur as a result of this proposal.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.25 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

None known

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

None known

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a residential area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

None

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads exist in the area, along with typical household noises. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises from this project will include construction noises which would occur only during approved hours as mandated by City of Camas and Washington State. Long-term noises could include an increase in traffic noise and normal household noises.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City of Camas.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has an existing single-family residence and an outbuilding. To the south is Camp Currie, park land owned by Clark County. To the east and the west of the site are single family homes on larger lots. To the north is vacant land.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

The Critical Areas Report for the site states that the site has a history of horse grazing. It is unknown whether the site has a history of being used as working farmlands or forest lands.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

One single-family residence and one outbuilding exist onsite.

d. Will any structures be demolished? If so, what? [help]

The existing home will remain; the outbuilding will be demolished.

e. What is the current zoning classification of the site? [help]

R7.5 – Residential

f. What is the current comprehensive plan designation of the site? [help]

SFM

g. If applicable, what is the current shoreline master program designation of the site? [help]

The SW corner of the site falls within the Urban Conservancy Shoreline Designation.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There are wetlands, a stream and Oregon white oaks on site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that this development will contain 38 lots/homes. At 2.8 people per household, there will be a total of approximately 107 people residing within this development at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

None.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

This project will not displace any people.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

There are no known impacts.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

37 new homes are proposed, one existing home will remain. The type of proposed housing is unknown at this time.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

No units will be eliminated.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new home construction will meet City of Camas building codes for residential housing development and not exceed height limits of 35'. Exterior building materials are unknown.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from a large-lot single family residence to a development with 38 single family homes.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The future single-family homes will be landscaped with grass lawns and other appealing landscaping. The main roadway frontage will be landscaped with trees per the City of Camas roadway standards. Large opens spaces and many onsite trees are proposed to be retained within the development.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When homes are constructed on the proposed lots, there will most likely be light produced from houses, yards, and street lights during evenings and early mornings.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Shielding of porch lights and streetlights will reduce light and glare impacts offsite.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camp Currie park is adjacent to the south, Lacamas Heritage Trail and Camas Meadows Golf Club are located to the southwest.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

The applicant proposes to pay all park impact fees associated with building permits. A 3.94-acre open space tract (Tract F) is proposed with picnic tables and trails that will provide recreation opportunities onsite.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

The existing single-family home is older than 45 years old, but it is unlikely that it would be eligible for national, state, or local preservation registers per the archaeological predetermination report.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

There are no known landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site. An Archaeological Predetermination Survey was performed by Archaeological Services, LLC for onsite work. The onsite study found no cultural materials.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, no further archaeological work is needed. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

Access to the site will be from NE 28th Street abutting the north side of the site. New residential roads will be constructed to serve the development. Proposed street layouts are shown on the preliminary plat.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is the Fishers Landing Transit Center approximately 6 miles to the southwest.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

Approximately 2-4 parking spaces per single-family home are proposed. This project will eliminate approximately 4 parking spaces with the removal of the existing home. Street parking will be allowed on both sides of the proposed residential roadway.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 28th Street up to half-width roadway standards. The construction of this project also proposes to construct internal public roadways to serve the proposed lots and provide circulation to potential future developments. See the preliminary plat for proposed roadway alignments.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

It is anticipated that 310 trips per day would be generated by the project. It is expected that 23 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 31 trips will occur in the PM peak hour (4:00 – 6:00).

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development and the construction of new homes will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for schools, traffic, and parks at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer,

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signed by:
Signature: Nick Edwards
B4B8362C57AF4B0...
Name of signee Nick Edwards
Position and Agency/Organization Land Entitlements Project Manager Lifestyle Homes
Date Submitted: 5/22/2025

Carey Certo

From: Robert Maul
Sent: Thursday, October 23, 2025 2:21 PM
To: Carey Certo; Yvette Sennewald
Subject: FW: SUB25-1004 The Reserve at Green Mountain (DAHP 2025-03-01781)

From: Stone, Jessica (DAHP) <jessica.stone@dahp.wa.gov>
Sent: Thursday, October 23, 2025 1:36 PM
To: Robert Maul <RMaul@cityofcamas.us>
Cc: 106review@ctwsbnr.org; Cowlitz Indian Tribe, Cultural Resources <permitreview@cowlitz.org>; Chinook Indian Nation <Office@chinooknation.org>; THPO@grandronde. org (THPO@grandronde.org) <thpo@grandronde.org>; Casey Barney <casey_barney@yakama.com>
Subject: RE: SUB25-1004 The Reserve at Green Mountain (DAHP 2025-03-01781)

WARNING: This message originated outside the City of Camas Mail system. DO NOT CLICK on links or open attachments unless you recognize the sender and are expecting the content. If you recognize the sender as a city employee and you see this message this email is a phishing email. If you are unsure, click the Phish Alert button to redirect the email for ITD review.

Dear Robert,

Thank you for contacting the DAHP regarding the above-referenced project. Because the project location is in an area marked “Very High Risk” for encountering archaeology by our Archaeological Risk Assessment Model, we recommend that a project-specific Inadvertent Discovery Plan (IDP) be created and kept on site and that project personnel receive training in the implementation of the IDP in the case of a discovery.

Please also note that DAHP Project Tracking Number 2025-03-01781 has been assigned to this project. Please include this number with any future related correspondence.

Thanks, and please let me know if you have any questions,
Jessica

Jessica Stone, Ph.D (she/her)
Assistant State Archaeologist

Email: jessica.stone@dahp.wa.gov| www.dahp.wa.gov
Cell: (360) 890-2633 | Main Office: (360) 586-3065
Hours: 7:30-4:00 PST Monday-Friday
Physical Address: 1110 S. Capitol Way, Suite 30, Olympia, WA 98501
Mailing Address: PO Box 48343, Olympia, WA 98504-8343

From: Community Development Email <communitydevelopment@cityofcamas.us>
Sent: Thursday, October 16, 2025 9:37 AM
To: Lisa Harker <lisa@plsengineering.com>; Camas School District, Laura Nowland

Carey Certo

From: Emily Boutain <eboutain@cowlitz.org>
Sent: Thursday, October 30, 2025 1:35 PM
To: Community Development Email
Cc: Stone, Jessica (DAHP); Shana Lombard; James Gordon; Sean Hess
Subject: Comments for SUB25-1004 The Reserve at Green Mountain
Attachments: Cultural Resource Protection Laws - Revised 29 January 2024.pdf; Cowlitz Indian Tribe Inadvertent Discovery Plan - Revised 20 February 2024.pdf

WARNING: This message originated outside the City of Camas Mail system. DO NOT CLICK on links or open attachments unless you recognize the sender and are expecting the content. If you recognize the sender as a city employee and you see this message this email is a phishing email. If you are unsure, click the Phish Alert button to redirect the email for ITD review.

To whom it may concern,

Given that the above-referenced project is within the Cowlitz Indian Tribe's area of concern, the Cultural Resources Department of the Cowlitz Indian Tribe would like to state its interest.

The Cultural Resources Department of the Cowlitz Indian Tribe recommends an Inadvertent Discovery Plan be attached to the permit; we have included language for your consideration.

This determination is based on all currently available knowledge and is subject to revision should new information arise. Please contact us with any questions or concerns you may have. We look forward to working with you on this undertaking.

Thank you for your time and attention.

Emily Boutain
Cultural Resources Technician
Cowlitz Indian Tribe
eboutain@cowlitz.org
(564) 220-0622

COWLITZ INDIAN TRIBE
The Forever People

This email may contain information which is protected by federal confidentiality laws (42CFR, Part 2). The information is solely for the use of the addressee named above. If you are not the intended recipient, any disclosure, copying, distribution or other use of the contents of this information is strictly prohibited. If you have received this email in error, please notify us by return email and delete this message. All Archaeological Sites are Exempt from public disclosure per RCW 42.56.300 Thank you.

Cultural Resource Protection Laws

Note: This list is not all-inclusive and does not take the place of consultation. Not all laws will apply in all situations. (Revised 29 January 2024)

Federal Laws

National Historic Protection Act (NHPA)	36 CFR 60	https://www.achp.gov/sites/default/files/regulations/2017-02/regs-rev04.pdf
Native American Graves Protection and Repatriation Act (NAGPRA)	43 CFR 10	https://www.nps.gov/subjects/nagpra/compliance.htm
Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments		https://www.federalregister.gov/documents/2000/11/09/00-29003/consultation-and-coordination-with-indian-tribal-governments

Washington State Laws

Archaeological Sites and Resources	27.53 RCW	https://apps.leg.wa.gov/RCW/default.aspx?cite=27.53
Executive Order 21-02		https://governor.wa.gov/sites/default/files/exe_order/eo_21-02.pdf
Notice of Forest Practices to Affected Indian Tribes	WAC 222-20-120	https://apps.leg.wa.gov/WAC/default.aspx?cite=222-20-120

Oregon State Laws

Indian Graves and Protection Act	ORS 97.740-S 97.760	https://oregon.public.law/statutes/ors_chapter_97
Archaeological Objects and Sites	ORS 358.905 - 358.995	https://oregon.public.law/statutes/ors_chapter_358

COWLITZ INDIAN TRIBE

INADVERTENT DISCOVERY LANGUAGE

In the event any archaeological or historic materials are encountered during project activity, work in the immediate area (initially allowing for a 100' buffer; this number may vary by circumstance) must stop and the following actions taken:

1. Implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering; and
2. Take reasonable steps to ensure the confidentiality of the discovery site; and,
3. Take reasonable steps to restrict access to the site of discovery.

The project proponent will notify the concerned Tribes and all appropriate county, state, and federal agencies, including the Department of Archaeology and Historic Preservation. The agencies and Tribe(s) will discuss possible measures to remove or avoid cultural material, and will reach an agreement with the project proponent regarding actions to be taken and disposition of material.

If human remains are uncovered, appropriate law enforcement agencies shall be notified first, and the above steps followed. If the remains are determined to be Native, consultation with the affected Tribes will take place in order to mitigate the final disposition of said remains.

See the Revised Code of Washington, Chapter 27.53, "Archaeological Sites and Resources," for applicable state laws and statutes. See also Washington State Executive Order 21-02, "Archaeological and Cultural Resources." Additional state and federal law(s) may also apply.

It is strongly encouraged copies of inadvertent discovery language/plan are retained on-site while project activity is underway.

Contact information:

James Gordon – Tribal Historic Preservation Officer
Cowlitz Indian Tribe
PO Box 2547
Longview, WA 98632

Cellular: 360-957-3004
jgordon@cowlitz.org

Revised 20 February 2024

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Southwest Region 5 • 5525 South 11th Street, Ridgefield, WA 98642
Telephone: (360) 696-6211

October 30, 2025

City of Camas, SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, WA 98607

Dear SEPA Official:

Thank you for the opportunity to comment on **The Reserve at Green Mountain (SUB25-1004)** project. The Washington Department of Fish and Wildlife (WDFW) has reviewed this proposal and offers the following comments for your consideration.

Our primary interest is in regard to the critical areas on site, particularly the multiple Oregon white oak (OWO) trees present within the project area. We offer our best management recommendations and guidance for the avoidance and minimization of impacts to OWO habitat.

WDFW considers Oregon white oak (OWO) woodlands to be a type of priority habitat per the agency's Priority Habitats and Species (PHS) List. OWO provide valuable food and habitat for many native Washington animal species, including migratory birds (rufous hummingbirds, band-tailed pigeons, chipping sparrows, and more), nuthatches, woodpeckers, raptors, squirrels, and a wide array of invertebrates, including oak-obligate species. OWOs take decades to reach maturity. Once established, oak trees can live for hundreds of years, providing immense benefits for local ecological communities. WDFW's *Best management practices for mitigating impacts to Oregon white oak habitat* (Nolan & Azerrad 2024) is the most current science when referencing guidance for avoiding, minimizing, and mitigating for impacts to OWO.

We appreciate that the project proponent has identified sixteen Oregon white oak trees onsite, and we commend the decision to preserve these trees. The removal of an asphalt driveway within an oak habitat area, as well as the enhancement of the native oak woodland understory, are beneficial actions that are expected to enhance the functioning of the oak habitat. For the driveway removal as well as all nearby construction activities, we advise that precautions be taken to avoid/minimize impacts to the oak trees' root systems. The Oregon State University Extension Service offers a useful resource on this topic: *Tree Protection Construction and Development Sites: A Best Management Practices Guidebook for the Pacific Northwest* (2009). We also recommend consultation with an ISA-certified arborist if any of the trees show declining health post-construction.

WDFW assistance is available upon request for guidance on avoiding and minimizing impacts to priority habitats and species, including Oregon white oaks and riparian habitat.

Thank you for the opportunity to provide input.

Sincerely,



Joy Peplinski, Habitat Biologist
Washington Department of Fish & Wildlife

In re: Reserve at Green Mountain

) NO. SUB25-1004
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on November 19, 2025, I directed a true and correct copy of the Notice of Public Hearing be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 20th day of November, 2025.

Alreanna Baldwin
Notary Public
State of Washington
My Appointment Expires 10/1/2028
Commission Number 183848

Alreanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2028

HAWRYLO ROBERT S II & HAWRYLO LIDIA TRUSTEES
16758 LA MAIDA ST
ENCINO, CA 91436

FREESE THAD V & FREESE SALLY KAYE TRUSTEES
2521 NE GOODWIN RD
CAMAS, WA 98607

HAWRYLO ROBERT S II & HAWRYLO LIDIA TRUSTEES
16758 LA MAIDA ST
ENCINO, CA 91436

TERRELL & ASSOC LLC ETAL
17933 NW EVERGREEN PL STE 300
BEAVERTON, OR 97006

CHADWICK STEPHANIE L & CHADWICK SCOTT
2619 NE GOODWIN RD
CAMAS, WA 98607

COBURN JAMES A
21715 NE 28TH ST #A
CAMAS, WA 98607

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

PACIFIC POWER & LIGHT COMPANY
825 NE MULTNOMAH STE 1900
PORTLAND, OR 97232

BAHU MARWAN A
212 SOWING OAK DR
SAN MARCOS, TX 78666

SHELDON BARBARA J & MULLINS BRIAN K
21731 NE 28TH ST
CAMAS, WA 98607

COBURN JAMES A
21715 NE 28TH ST
CAMAS, WA 98607

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

FREESE THAD V & FREESE SALLY KAYE TRUSTEES
2521 NE GOODWIN RD
CAMAS, WA 98607

CITY OF CAMAS
616 NE 4TH AVE
CAMAS, WA 98607

Community Development Department

Notice of Public Hearing

The Reserve at Green Mountain Subdivision

Planning Case SUB25-1004

A public hearing will be held on **Tuesday, December 9, 2025, at 5:00 p.m.,** or soon thereafter, before the City's Hearings Examiner to consider the preliminary plat application for The Reserve at Green Mountain Subdivision. The public hearing will be held remotely and in person at city hall. The applicant proposes to subdivide approximately 11.3 acres into 38-single-family residential lots. The site is situated in the R-7.5 – Single Family Residential Zone and is located at 2625 NE Goodwin Road in the SW ¼ of Section 21, Township 2 North, Range 3 East; Camas, WA. Parcel Number 173192000. The application was determined technically complete on September 2, 2025.

Questions/Comments: The public hearing will follow the quasi-judicial process described within Camas Municipal Code §18.55.180. Comments related to this development may be submitted as follows: (1) in person by testifying at the public hearing; (2) by regular mail to Community Development Department staff, Yvette Sennewald, Senior Planner, at Camas City Hall, 616 Northeast Fourth Avenue, Camas, WA 98607; (3) by phone at (360) 817-1568; or (4) by email to: communitydevelopment@cityofcamas.us. It is preferable that written comments be received at least five working days prior to the public hearing, in order to be available with the online agenda and materials. After the agenda has been posted online, all other written comments must be received no later than noon (12:00 p.m.) the day of the hearing, in order for those comments to be handed to the Hearings Examiner by Staff. Written and oral comments may also be submitted in person during the hearing.

Application Materials: The application included the following: project narrative, development plans and environmental reports, as required for a complete application pursuant to Camas Municipal Code (CMC) §18.55.110. The application materials are available for viewing at the Community Development Department (616 NE 4th Avenue, Camas, WA) during regular business hours Monday – Friday 8 a.m-5 p.m.

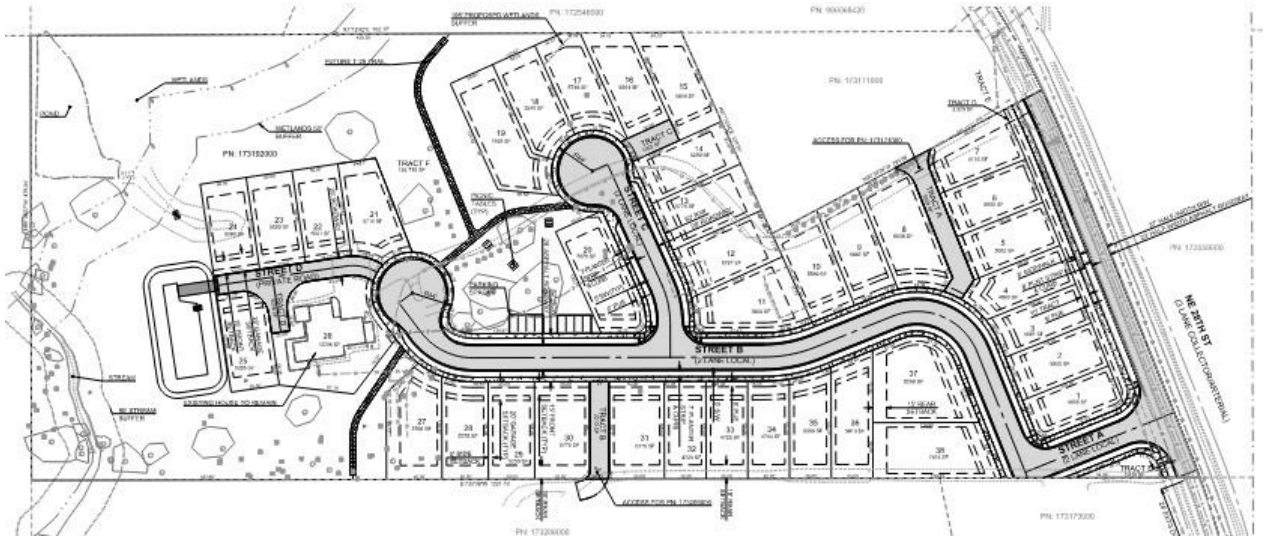
Participate: All citizens are entitled to have equal access to the services, benefits and programs of the City of Camas. Please contact the **City Clerk at (360) 817-1591** for special accommodations if needed. The city will provide translators for non-English speaking persons who request assistance at least three working days prior to a public meeting or hearing.

More Information: The public hearing agenda and supporting documents will be available for review on the City's website at the "Minutes, Agendas & Videos" link within the drop-down menu that is labeled "Your Government" or follow this link: http://www.cityofcamas.us/yourgovernment/minuteagendavideo.

Published in the Post Record on November 20, 2025 Legal Publication #1049780
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on November 19, 2023

Proposed Preliminary Plat

The Reserve at Green Mountain Subdivision (Planning Case SUB25-1004)





Community Development Department

Notice of Public Hearing

The Reserve at Green Mountain Subdivision

Planning Case SUB25-1004

A public hearing will be held on **Tuesday, December 9, 2025, at 5:00 p.m.,** or soon thereafter, before the City's Hearings Examiner to consider the preliminary plat application for The Reserve at Green Mountain Subdivision. The public hearing will be held remotely and in person at city hall. The applicant proposes to subdivide approximately 11.3 acres into 38-single-family residential lots. The site is situated in the R-7.5 – Single Family Residential Zone and is located at 2625 NE Goodwin Road in the SW ¼ of Section 21, Township 2 North, Range 3 East; Camas, WA. Parcel Number 173192000. The application was determined technically complete on September 2, 2025.

Questions/Comments: The public hearing will follow the quasi-judicial process described within Camas Municipal Code §18.55.180. Comments related to this development may be submitted as follows: (1) in person by testifying at the public hearing; (2) by regular mail to Community Development Department staff, Yvette Sennewald, Senior Planner, at Camas City Hall, 616 Northeast Fourth Avenue, Camas, WA 98607; (3) by phone at (360) 817-1568; or (4) by email to: communitydevelopment@cityofcamas.us. It is preferable that written comments be received at least five working days prior to the public hearing, in order to be available with the online agenda and materials. After the agenda has been posted online, all other written comments must be received no later than noon (12:00 p.m.) the day of the hearing, in order for those comments to be handed to the Hearings Examiner by Staff. Written and oral comments may also be submitted in person during the hearing.

Application Materials: The application included the following: project narrative, development plans and environmental reports, as required for a complete application pursuant to Camas Municipal Code (CMC) §18.55.110. The application materials are available for viewing at the Community Development Department (616 NE 4th Avenue, Camas, WA) during regular business hours Monday – Friday 8 a.m-5 p.m.

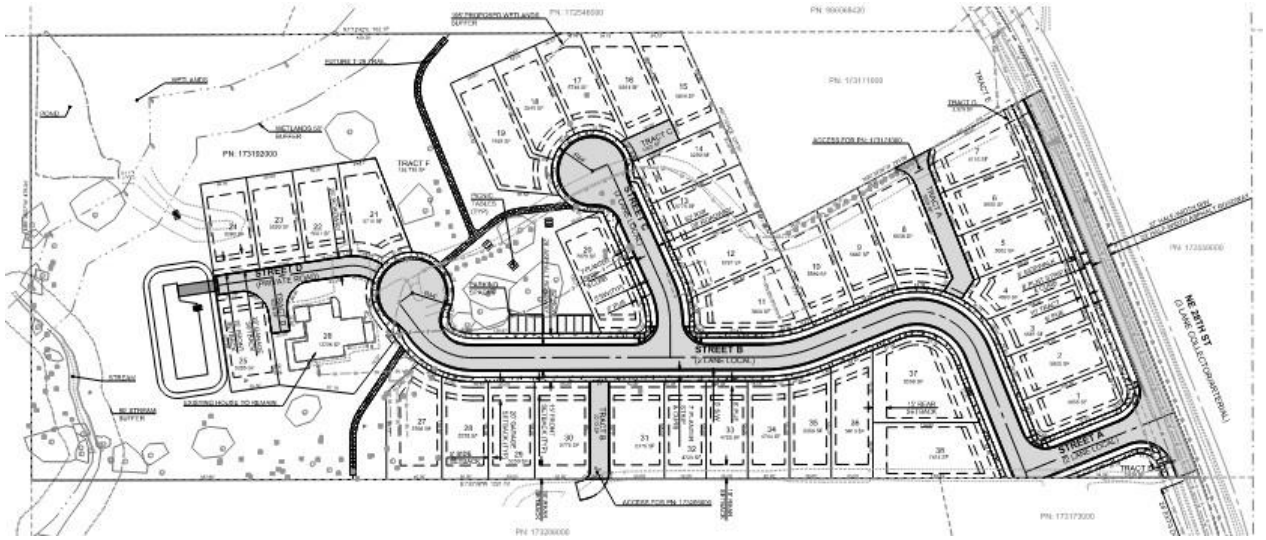
Participate: All citizens are entitled to have equal access to the services, benefits and programs of the City of Camas. Please contact the **City Clerk at (360) 817-1591** for special accommodations if needed. The city will provide translators for non-English speaking persons who request assistance at least three working days prior to a public meeting or hearing.

More Information: The public hearing agenda and supporting documents will be available for review on the City's website at the "Minutes, Agendas & Videos" link within the drop-down menu that is labeled "Your Government" or follow this link: http://www.cityofcamas.us/yourgovernment/minuteagendavideo.

Published in the Post Record on November 20, 2025 Legal Publication #1049780
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on November 19, 2023

Proposed Preliminary Plat

The Reserve at Green Mountain Subdivision (Planning Case SUB25-1004)





The Reserve at Green Mountain (SUB25-1004)
Index of Exhibits

Exhibit No.	Title/Description	Document Date
1	Applicants Narrative	5/2025
2	Pre-Application Conference Notes	12/5/25
3	Transportation Impact Study	4/23/25
4	Geotechnical Report	5/2025
5	Critical Areas Report	5/1/25
6	Tree Survey	5/2/25
7	Mailing Labels	5/6/25
8	Title Report	5/19/25
9	SEPA Checklist	5/22/25
10	Preliminary Plat	
11	Utility Plan	
12	Preliminary Grading Plan	
13	Existing Conditions	
14	Preliminary Landscape Plan	
15	Landscape Details	
16	Clark County Public Health Review Letter	6/11/25
17	Welcome Letter	6/24/25
18	2nd Review Letter	7/29/25
19	Applicant Response to 2nd Review Letter	7/30/25
20	3rd Review Letter	8/5/25
21	Preliminary Stormwater Plan & Technical Information Report	8/25/25
22	Technically Complete Letter	9/2/25
23	Development Sign Posting	1/26/25
24	Affidavit of Mailing Notice of Application	10/8/25
25	Notice of Application	10/9/25
26	Affidavit of Mailing SEPA Determination of Non-Significance	10/15/25
27	SEPA Determination of Non-Significance	10/16/25
28	SEPA Distribution Packet	10/16/25
29	Department of Archaeology & Historic Preservation Public Comment	10/23/25
30	Cowlitz Indian Tribe Public Comment	10/30/25
31	Department of Fish & Wildlife Public Comment	10/30/25
32	Affidavit of Mailing Notice of Public Hearing	11/19/25
33	Notice of Public Hearing	11/20/25

STAFF REPORT

The Landing at Green Mountain 2 Subdivision

Planning Case SUB25-1006

Report Date: December 3, 2025

TO	Hearings Examiner	**HEARING DATE**	December 9, 2025
PROPOSAL	To subdivide approximately 9.6 acres situated in the R-7.5 – Single-Family Residential Zone into 34-lots to facilitate the future development of single-family detached residential homes.		
LOCATION	The site is located at 22015 & 22111 NE 28th Street in the SW ¼ of Section 21, Township 2 North, Range 3 East, of the Willamette Meridian; and described as tax parcel numbers 611175000, 173177000, and 173210000.		
PROPERTY OWNERS	**Linda Middagh** 22015 NE 26th Street Camas, WA 98607 **Emmert Family III LLC** 10470 SE Hillcrest Drive Happy Valley, OR 97086	**APPLICANT**	PLS Engineering Attn: Jayson Taylor 604 W Evergreen Boulevard Vancouver, WA 98660
APPLICATION SUBMITTED	August 11, 2022	**APPLICATION COMPLETE**	September 24, 2025
SEPA	The City issued a SEPA Determination of Non-significance (DNS) on October 16, 2025, with a comment period that closed on October 30, 2025. The SEPA DNS was mailed to property owners within 300-feet of the subject site on October 15, 2022, and published in the Post Record on October 16, 2022, as Legal publication #1042060.		
PUBLIC NOTICES	A Notice of Application was mailed to property owners within 300 feet of the site on October 8, 2025, and published in the Post Record on October 9, 2025. Legal publication #1040950. A Notice of Public Hearing was mailed to property owners within 300 feet of the site on November 19, 2025, and published in the Post Record on November 20, 2025. Legal publication #1049790.		

APPLICABLE LAW: The application was submitted on July 14, 2025, and the applicable codes are those codes that were in effect at the date of the application's first submittal. Camas Municipal Code (CMC) Title 16 Environment, Title 17 Land Development, and Title 18 Zoning, specifically (but not limited to): Chapter 17.11 Subdivision, Chapter 18.11 - Parking, Chapter 18.13 - Landscaping, and Chapter 18.55 Administrative Procedures. [Note: Citations from Camas Municipal Code (CMC) are indicated in *italic* type.]

CONTENTS

SUMMARY 2

FINDINGS 2

Chapter 16.07 State Environmental Policy Act 2
Chapter 16.31 Archaeological Preservation 3
Chapter 16.51 Critical Areas 3
Chapter 17.11 Subdivisions 5
PUBLIC COMMENTS 25
CONCLUSION 25
RECOMMENDATION 25
CONDITIONS OF APPROVAL 25

SUMMARY

An application has been made to the City of Camas for preliminary plat approval to subdivide approximately 9.6 acres situated in the R-7.5 Single-Family Residential Zone. The preliminary plat proposes to subdivide the subject property into 34 lots, ranging in size from approximately 5,000 – 41,512 square-feet.

Surrounding uses to the north, west, and east are single-family residential. To the south of the project site is Camp Currie Park. An overhead 100-foot-wide Bonneville Power Authority powerline easement runs diagonally east/west through the site. The single-family residential properties immediately to the west of the subject site are in the R-7.5 zone. The properties to the north (Green Mountain Subdivision) are zoned R-6. The properties adjacent to the easterly and southerly property lines include parcels that are zoned PF – Public Facilities.

The subject properties are currently developed with single-family residences and outbuildings. The existing structures on parcel 17321000 are proposed to remain, while all structures on parcel 173177000 will be removed. The topography of the site and within the vicinity of the study area, slopes in elevation from the highest point along NE 28th Street in the north to south/southwest. Seasonal hydrology flows offsite and southwest to the valley floor to the Lacamas Creek corridor. A maintained BPA powerline easement that is 100-feet wide, bisects the project area diagonally east/west. The site is generally dominated by open pasture areas with scattered native and non-native trees. Little native understory existing within the bulk of the property due to a history of grazing of the open pastures and maintained lawn surrounding the residences. Trees that are concentrated within the project area are located in the southern parcel boundaries, adjacent to forest land owned by Clark County. It should be noted that a series of trails and maintained access/logging road is present to the south on the county property with connection ultimately south to Lacamas Lake and Camp Currie. The preliminary plans indicate that there will be tracts set aside for a stormwater facility, open space, access, landscaping, and other related infrastructure.

The proposed preliminary plat does or can comply with the applicable standards of the Camas Municipal Code (CMC) and Revised Code of Washington (RCW).

FINDINGS

Chapter 16.07 State Environmental Policy Act

A SEPA checklist was submitted, and a Determination of Non-Significance (DNS) was issued on October 16, 2025, as the proposed development includes more than nine residential dwelling units per CMC

16.07.020.A.1. and contains critical areas. The comment period ended October 30, 2025. Three comments were received. One comment was from the Department of Ecology regarding solid waste management and water quality (Exhibit 28). One comment was from the Department of Fish and Wildlife (WDFW) regarding the existing Oregon white oak tress located onsite (Exhibit 30), and a comment was from the Cowlitz Indian Tribe with a recommendation for a project-specific Inadvertent Discovery Plan (Exhibit 29), given that the project is within the Cowlitz Indian Tribe's area of concern.

> **FINDING:** Staff finds the comments provided by the Department of Ecology, WDFW, and the Cowlitz Indian Tribe should be complied with.

Chapter 16.31 Archaeological Preservation

The subject property is within a high and moderate to high probability for the presence of archeological artifacts. The site is also within an Archeological Site Buffer per Clark County GIS data; therefore, an archaeological predetermination report has been prepared for the site. The report prepared by Archeological Services LLC, dated May 16, 2025, was sent to the Department of Archaeology and Historic Preservation as well as the tribes. The report noted that no archeological artifacts were found during the onsite field investigation. Based on the findings in the report, no further archaeological work is recommended at this time. The report and findings are not subject to the open public records act and as such, the City cannot disclose the results.

> **FINDING:** Staff finds a condition of approval is warranted that if potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified. A condition of approval that requires the applicant to submit an Inadvertent Discovery Plan is also warranted, based on the comment letter received from the Cowlitz Indian Tribe during the SEPA comment period.

Chapter 16.51 Critical Areas

CMC Chapter 16.53 - Wetlands

Per Clark County GIS, the subject property is mapped as having the presence of wetlands on the property known as 22111 NE 28th Street, however, indicates that none are present on the parcel known as 22015 NE 28th Street. A Critical Areas Report prepared by Ash Eco Solutions dated July 1, 2025 (Exhibit 10), notes that site reconnaissance confirmed that no wetlands are located within the subject project area.

CMC Chapter 16.61 – Fish and Wildlife Habitat Conservation Areas

Habitats of Local Importance- Oregon White Oaks

The WDFW maps individual Oregon white oak trees on the project site and adjacent to the eastern subject parcel. The oak trees were inventories and identified in the Critical Areas Report from Ash Eco Solutions, LLC (AES) dated May 16, 2025.

WDFW defines Oregon white oak priority habitat as; Oregon White Oak Woodlands are *"stands of oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%; or where total canopy coverage of the stand is 25% but oak accounts for at least 50% of the canopy coverage. The latter is often referred to as oak savanna. In non-urbanized areas west of the Cascades, priority oak habitat consists of stands >0.4 ha (1.0 ac) in size. East of the Cascades, priority oak habitat consists of stands >2 ha (5 ac) in size. In urban or urbanizing areas, single oaks or stands <0.4 ha (1 ac) may also be considered a priority when found to be particularly valuable to fish and wildlife (i.e., they contain many cavities, have large diameter at breast height [dbh] (generally 20-inches dbh and greater), are used by priority species,*

or have a large canopy. Oak woodlands in western Washington may contain understory plants indicative of Prairie."

A total of five Oregon white oak trees were located within the project area. Four of the five individual Oregon white oak trees identified onsite are over 20-inches dbh and therefore meet the criteria listed under CMC 16.61.010.A.3.a that defines Oregon white oak habitat of local importance:

i. Individual Oregon white oak trees with a twenty-inch diameter at breast height (twenty inches dbh).
ii. Stands of Oregon white oak trees greater than one acre, when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height (12 inches dbh), are used by priority species, or have a large canopy.
iii. All Oregon white oak snags unless determined by an arborist to be a hazard.

The project proposes the removal of one of these jurisdictional Oregon white oak trees (Oak #47). Mitigation to offset the removal of this jurisdictional oak tree is proposed to meet CMC 16.61 Fish and Wildlife Habitat Conservation Areas code. The onsite oak mitigation will consist of Oregon white oak tree and native scrub enhancement within the southern portion of the site that will offset the removal of the single oak tree. The mitigation plan will also incorporate oak mitigation and native enhancement within the wetland buffer also located in the far southern extent of the project area and will allow for an extension of the existing treeline in this area. The perimeter of the stormwater facility is proposed to be planted with oak mitigation plantings, as well as the understory of the adjacent large oak to be preserved in this area.

Following the mitigation sequencing requirements outlined under CMC 16.51.170, the project has avoided and minimized impacts to the full extent practicable while still meeting the required design elements for a subdivision of this size. The Critical Areas Report indicates that unavoidable impacts have been quantified, and appropriate mitigation has been proposed onsite for a no net loss of habitat area or function onsite. The mitigation plan includes placing protection around the perimeter of the mitigation areas during site grading and construction activities and after. The mitigation proposed will offset the Oregon white oak Priority Habitat impacts onsite for no net loss of priority function or area following CMC guidelines.

WDFW also indicates that "Cave or Cave-rich Areas" occur within the general area surrounding the subject site, though no evidence of caves or rock outcroppings were identified by AES during their site reconnaissance.

CMC Chapter 16.51 – General Provisions for Critical Areas

Staff recommends a condition of approval for the installation of temporary construction fencing prior to construction that clearly marks in the field critical area buffers (i.e., Oregon White Oaks) and fencing should remain throughout permitted construction activities. In addition, prior to final engineering plan final acceptance, permanent signs and fencing should be installed at the edge of the critical area buffers per CMC 16.51.210.B and C. Sign and fencing specifications should be submitted to the City for review and approval prior to installation.

Prior to final acceptance, a conservation covenant should be recorded with the County to ensure the long-term preservation of the critical areas and any associated buffers, including maintenance of any mitigation actions, per CMC 16.51.240 and conditioned as such. Further, a copy of the recorded conservation covenant document must be submitted to the city prior to final acceptance.

The applicant will be required to post a mitigation bond in an amount deemed acceptable by the city to ensure the oak mitigation is fully functional per CMC 16.51.250.

Staff finds a condition of approval is required that detailed construction drawings per CMC 16.53.050.E.3 are submitted to the City for review and approval prior to final engineering plan approval.

> **FINDING:** Staff finds the proposal, as conditioned, can or will comply with the applicable provisions of CMC Title 16 Environment as discussed above.

Chapter 17.11 Subdivisions

CMC Chapter 17.11.030(D) Criteria for Preliminary Plat Approval:
The hearings examiner's decision on application for preliminary plat approval shall be based on the following criteria:

1. The proposed subdivision is in conformance with the Camas Comprehensive Plan, Parks and Open Space Comprehensive Plan, Neighborhood Traffic Management Plan, and any other City adopted plans.

Comprehensive Plan
The subject property is designated as Single-Family Medium in the City's Comprehensive Plan, which includes the Single-Family Residential R-7.5 zone designation.

Overall, the 2035 City of Camas Comprehensive Plan supports the subdivision through several land use policies such as the following:

- Land Use Policy 1.3: Maintain compatible use and design with the surrounding built and natural environments when considering new development or redevelopment.
- Land Use Policy 1.5: Where compatible with surrounding uses, encourage redevelopment or infill development to support the efficient use of urban land.
- Land Use Policy 3.3: Encourage connectivity between neighborhoods (vehicular and pedestrian) to support citywide connectivity and pedestrian access.
- Housing Policy 1: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community.
- Housing Policy 1.6: Encourage in-fill development on vacant or underutilized sites, subject to design review guidelines, that have adequate urban services and ensure that the development is compatible with the surrounding neighborhood.

The proposed subdivision will help accommodate the projected growth through the utilization of existing land. The proposed houses, when built, will provide housing opportunities to meet the needs of the community in accordance with the Housing Element of the Comprehensive Plan.

Parks and Open Space Plan
The 2022 Parks and Recreation Open Space Plan (PROS) identifies the future T-29 trail that is shown to traverse west-to-east through the southernmost limits of the proposed subdivision. The property located to the south and east of the proposed development is owned by Clark County Parks. Per the City's 2022 General Sewer Plan (GSP) a future sanitary sewer pressure main, traversing west-to-east, from the Goodwin Road Lift Station (LS) to NE 232nd Avenue is proposed. The applicant is required to construct a segment of the T-29 public access trail that will be located on said development. An easement over and under the segment of the T-29 is required that encompasses both the public access trail and the future sanitary sewer main.

> Staff recommends a condition of approval that prior to final plat approval, the applicant is required to show an easement encompassing the T-29 public access trail and the future sanitary sewer pressure main.

Neighborhood Traffic Management Plan:
The city has a Neighborhood Traffic Management Plan (NTM). The NTM plan identifies the need for installation of acceptable traffic calming features when a proposed development will create 700 Average Daily Trips (ADT) or more.

The Transportation Impact Study (TIA) prepared by Lancaster Mobley (Exhibit 3, Table 3, page 8), dated April 23, 2025, found the project is expected to generate approximately 292 net new trips, Average Daily Trips (ADT) with 21 new AM Peak Hour trips (6 In / 15 Out) and 29 PM Peak Hour trips (18 In / 11 Out). Therefore, the proposed development will not be required to install traffic calming features.

> **FINDING:** Staff finds that the proposed project can and will meet the requirements as noted in the City's NTM plan.

2. Provisions have been made for water, storm drainage, erosion control, and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual.

Water:
In accordance with CMC 17.19.040.C.4 Water System, each lot within a proposed development shall be served by a water distribution system designed and installed in accordance with the city's *Design Standards Manual* (CDSM).

There is an existing 24-inch ductile iron (DI) transmission water main located on the south side NE 28th Street. Per CDSM, a minimum 8-inch water distribution system will be provided for the benefit of the proposed development with a minimum 1-inch water service provided to each lot.

Preliminary utility plans were submitted with the original July 2025 application. Revised preliminary utility plans were submitted August 2025, with a third revision submitted in September 2025 (Exhibit 13). The following discussion is based on the September 2025 submittal (Exhibit 13).

The preliminary utility plans (Exhibit 13) show the proposed 8-inch DI water main tapped off the existing 24-inch DI water main in NE 28th Street at the northernmost end of the cul-de-sac of Wright Court. The new 8-inch water main is then extended south to the intersection of Wright Court and NE 80th Avenue to a dead-end blowoff valve at the westernmost end of NE 80th Avenue.

Per the Camas Design Standards Manual (CDSM), General Detail G8, Utility Easements; a minimum 30-foot-wide utility easement is required for three utilities. The proposed 8-inch DI water main tapped from the 24-inch DI water main in NE 28th Street is one of three utilities; water, sanitary sewer, and storm that are extended from NE 28th Street south via the cul-de-sac on Wright Court.

> Staff recommends a condition of approval that prior to final plat approval, a minimum 30-foot-wide utility easement over and under said utility easement is to be shown on the final plat and conveyed to the city for inspections, maintenance, and repairs of said utilities located within the easement.

There are three additional 8-inch DI water main legs that are extended west at the intersections of Wright Court and NE 81st Avenue; and Wright Court and NE 82nd Avenue to a dead-end blows at the westernmost end of future NE 81st Street and NE 82nd Avenue. All three 8-inch water main legs are extended to the west property line of the proposed development for the benefit of future developments.

Per CMC 17.19.040.C.4.a a minimum 1-inch water service is to be provided to each dwelling unit of the proposed development.

The proposed improvements include 33 new single-family lots, and existing structures will remain part of Lot 34. The preliminary utility plans (Exhibit 13) show the required water service to each of Lots 1 through 34.

Per CMC 17.19.040.C.4.a Locations of fire hydrants and flow rates shall be in accordance with city standards and the International Fire Code.

The preliminary utility plans (Exhibit 13) show two (2) future fire hydrants located on future Wright Court, between Lots 3 and 4; and Lots 29 and 30. These two locations are spaced approximately 550-feet apart and are on the east side of Wright Court. There aren't any fire hydrants shown on N 80th Avenue or N 81st Avenue, which are dead-ends that are approximately 360-feet and 300-feet respectively from the future fire hydrant between Lots 29 and 30 on Wright Court. During engineering plan review it may be determined by the Fire Marshal that additional fire hydrants may be required.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should work with engineering and the Fire Marshal's Office to determine if an additional fire hydrant is required on future N 80th Avenue or future N 81st Avenue.

Per CMC 17.19.040.C.4.d Landscaping in open space tracts must have a service for an irrigation meter. Irrigation services are to be a minimum 1-inch service. The size of the irrigation meter is to be determined in advance and shown on the water utility plans and the landscape plans. The owner of the open space tract is responsible for installation of the meter and the water usage. Landscaping water services and meters are to be privately owned and maintained by the Owner and/or Homeowners Association (HOA).

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should submit revised water utility plans showing the locations of all proposed irrigation services and the size of each irrigation meter.

Staff recommends a condition of approval that prior to final plat approval, a note is to be added to the final plat stating that irrigation meters required for open space areas are to be privately owned and maintained by the Owners and/or Homeowners Association (HOA).

Proposed Plat Note: Irrigation meters required for open space areas are to be privately owned and maintained by the Owners and/or Homeowners Association (HOA).

FINDINGS: Staff finds that, as conditioned, adequate provisions for water can or will be made in accordance with CDSM and CMC 17.19.040.

Storm Drainage:

In accordance with CMC 17.19.040.C.3 the storm drainage collection system shall meet the requirements of the city's stormwater standards, the *Camas Design Standards Manual* (CDSM), and CMC 14.02 Stormwater Control.

Per Figure 1-3.2: Flow Chart for Determining Requirements for Redevelopment of Ecology's Stormwater Management Manual for Western Washington (SWMMWW), if the land-disturbing activities are greater than 7,000-square feet, Minimum Requirements (MRs) 1-9 will apply.

Per Clark GIS Property Information, the site for the proposed development is approximately 9.6 acres (418,176 SF) in size. The proposed development will have land-disturbing activities greater than 7,000-square feet, therefore Minimum Requirements (MRs) 1-9 apply.

A preliminary stormwater Technical Information Report (TIR) (Exhibit 17), dated July 2025, was prepared by PLS Engineering. The site contains existing structures; a 1,900 square-foot house, a 1,200 square-foot shop, and a 3,080 square-foot chicken coop. There is an existing 100-foot-wide BPA easement that

transects the site from northwest to southeast; with electrical power line towers that support the high-voltage power lines located within the easement. The reminder of the site is vegetated with grass, weeds, and a variety of trees. The site slopes generally from the northeast to the southwest with grades ranging from 3% to 10%. There are slopes up to 20% in the southwestern portion of the site.

MR #1 – Preparation of Stormwater Site Plans: The preliminary stormwater utility plan was incomplete. The plans were not a complete set of the stormwater design system, including profiles of the conveyance system, sizing of laterals and manholes; and design plans for the stormwater facilities.

> Staff recommends a condition of approval that prior to engineering plan approval the applicant should submit a complete set of stormwater plans, including the design for the collection and conveyance system in accordance with the Camas Design Standards Manual (CDSM); and a complete set of the design plans for the stormwater detention and treatment system, per MR #1 of the TIR.

MR #2 – Construction Stormwater Pollution Prevention Plan (SWPPP): The SWPPP was included as Appendix E of the preliminary TIR.

MR #3 – Source Control of Pollution: The preliminary TIR addresses the various BMPs required for source control in the SWPPP included in Section D.

MR #4 – Preservation of Natural Drainage Systems and Outfalls: PerThe preliminary TIR stormwater runoff flows to the southwest corner of the site. The proposed development will capture all the runoff and release said runoff at rates that are in compliance with the SWMMWW. The will assist in maintaining and preserving the natural drainage systems.

MR #5 – On-Site Stormwater Management: The preliminary TIR addresses this requirement in Section E.

MR #6 – Runoff Treatment: The preliminary TIR addresses this requirement in Section F. Treatment is proposed via treatment catch basins and manholes. Treatment and detention structures located in the public right-of-way is not supported by staff.

> Staff recommends a condition of approval that prior to engineering plan approval the stormwater plans are to be revised with any and all proposed treatment structures, including treatment manholes; and detention structures located outside of the public right-of-way.

MR #7 – Flow Control: The preliminary stormwater report (TIR), sufficiently discusses the proposed flow control methods in Section G.

MR #8 – Wetlands Protection: Appendix F and Section H, of the preliminary TIR states sufficiently address the proposed wetland protections.

MR #9 – Operation and Maintenance (O&M): The preliminary TIR provided addresses the O&M manual in Section L, with a copy of the O&M manual in Appendix D. In addition to the city's 2022 O&M Manual, documentation of the maintenance requirements are to be provided for the treatment structures, as the stormwater facilities located in Tract A are to be owned and maintained by the Homeowners Association (HOA)/homeowners.

> Staff recommends a condition of approval that prior to engineering plan approval, the applicant should submit document of the maintenance requirements for the stormwater treatment structures, as the stormwater facilities located in Tract A are to be owned and maintained by the Homeowners Association (HOA)/homeowners.

Per CMC 14.02 and 17.19.040, stormwater is not to negatively affect adjacent property owners. This requirement encompasses both roof drain downspouts and overland surface flow as noted below:

- CMC 14.02 Stormwater Control:
  14.02.010.B.2 Minimize damage to property from increased runoff rates and volumes.
- CMC 17.19 Design and Improvement Standards:
  17.19.040.C.3 Storm Drainage - The storm drainage collection system shall meet the requirements of the city's officially adopted storm water standards.
- 17.19.040.C.3.e - All lots shall provide drainage for stormwater runoff from roof and footing drains to an approved drainage system. Rear yard low point area drains and/or storm drain lateral stubs connected to an approved drainage system shall be provided to each lot as necessary to prevent stormwater runoff impacts to adjoining parcels as determined by the city.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should submit a revised stormwater plan for Lots 1-34. Said plan should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.

Per CMC 17.19.040.C.a, storm drainage facilities shall be placed on their own tract or within an open space tract and are to be owned and maintained by the homeowners and/or the HOA.

Per the preliminary plat (Exhibit 12) and the preliminary utility plan (Exhibit 13), the proposed stormwater facility is shown to be located within a tract that includes Oregon White Oaks, the pedestrian T-29 trail, and a sanitary sewer easement for the city's future Sanitary Sewer Force Main.

Per CMC 14.02.090.1 Stormwater facilities, located within residential subdivisions and short plats, shall be the maintenance responsibility of the applicant for two years after date of final acceptance. The 2-year maintenance period shall run concurrently with the city's required two-year warranty period that begins at final acceptance.

Prior to end of the two-year warranty period, and upon inspection by the city, the applicant shall ensure that a fully functional facility is turned over to the new owners (e.g., homeowners' associations/homeowners). At completion of the 2-year warranty period, the stormwater facilities in Tract A will be owned and maintained by the Homeowner's Association/homeowners. Per CMC 14.02.C, the City shall have the right-of-entry and authority to inspect the stormwater facilities located in Tract A.

Staff recommends a condition of approval that prior to final plat approval the following proposed plat notes are to be added to the final plat.

Proposed Plat Notes:

Stormwater facilities located on Tract A are to be owned and maintained by the homeowner's association (HOA)/homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.

Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tract A.

FINDINGS: Staff finds that, as conditioned, the applicant can and will make adequate provisions for stormwater control, conveyance, and water quality treatment.

Erosion Control:

In accordance with CMC 14.06 Erosion Control, adequate erosion control measures are to be provided during the site improvements for the proposed development in accordance with the *Camas Design Standards Manual* (CDSM) and Ecology's *Stormwater Management Manual for Western Washington* (SWMMWW).

Per CMC 17.21.030.A installation of erosion prevention / sediment control measures are required per an approved erosion and sediment control plan. The preliminary plans that were submitted with the application did not include the erosion and sediment control plans.

Staff recommends a condition of approval that prior to engineering approval, the applicant should be required to submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

Per CMC 17.21.030.C construction of storm drainage facilities required to detain and dispose of stormwater is to commence prior to work on other portions of the project. The city may require the construction of a temporary storm drainage facility that would bypass and protect the permanent facility until such time as the rest of the project is complete and ready for the permanent facility to be brought online.

Per Clark GIS Property Information, the site for the proposed development is approximately 9.6 acres (418,176 SF) in size.

Per CMC 14.06.200 and CMC 17.21.030.B financial security for erosion control, in the amount of 200% of the estimated erosion control items is required prior to land-disturbing activities of one acre or more. The erosion control financial security is to be submitted to the city prior to start of any land-disturbing activities. Additionally, the applicant will be required to provide a copy of both their *NPDES General Construction Stormwater Permit* (GCSWP) and their *Stormwater Pollution Prevention Plan* (SWPPP), which is a requirement of the NPDES GCSWP permit. The NPDES GCSWP permit is issued by the Washington State Department of Ecology for land-disturbing activities of an acre or more.

Staff recommends a condition of approval that prior to any land-disturbing activities, a copy of Ecology's NPDES GCSWP permit, a copy of the SWPPP, and the financial security for erosion and sediment control are to be submitted to the city.

Staff recommends a condition of approval that prior to any land-disturbing activities, which includes tree cutting, clearing and grading, and an approved set of final engineering plans, including the erosion prevention and sediment control measures is required.

FINDINGS: Staff finds that, as conditioned, adequate provisions for erosion control can or will be made.

Sanitary Sewage Disposal:

In accordance with CMC 17.19.040.C.2, sanitary sewers shall be provided and designed in accordance with the city's *Design Standards Manual* (CDSM).

The General Sewer Plan Amendment of April 2010 (GSP) provides a plan on how the Northshore (previously known as the North Urban Growth Area (NUGA)) will be served. The Northshore is divided into six basins served by multiple regional pump stations and major force main and gravity piping systems. The GSP calls for traditional gravity sewer flows (including solids) from all six basins to be directed south and east along the north side of Lacamas Lake.

The subject property is located in Basin 1 as shown in the GSP. As described above, Basin 1 is to be permanently serviced by the regional pump station and force main system along the north side of Lacamas Lake. The city constructed the North Shore Sewer Transmission System (aka NUGA-STS) in 2018. This system begins at the Goodwin Road Pump Station (No. 1), the regional pump station that is located on Goodwin Road just west of the intersection of Ingle Road and Goodwin Road.

The City's General Sewer Plan and Sewer System Development Charge Calculations assume that 66 percent of the permanent system will be constructed by the development community. As such, prior to

building permit issuance, the Applicant will be required to provide a proportionate share payment of the NUGA-STS necessary to serve the site. The proportionate share amount has been determined to be $1,235.77 per Lot.

Staff recommends a condition of approval that prior to final plat approval, a plat note addressing the proportionate share amount per Lot, payable to the city for the North Shore Sewer Transmission System (aka NUGA-STS) is warranted.

Proposed Plat Note:
At the time of building permit issuance, each Lot is subject to a $1,235.77 fee per Lot, as the proportionate share contribution for the North Shore Sewer Transmission System, previously known and approved as the 'North Urban Growth Area – Sewer Transmission System' or NUGA-STS. If the NUGA SDC fees are updated to include the proportionate share fee amount of $1,235.77 per Lot, the proportionate share fee will no longer be required.

Preliminary utility plans were submitted with the original July 2025 application. Revised preliminary utility plans were submitted August 2025, with a third revision submitted in September 2025 (Exhibit 13). The following discussion is based on the September 2025 submittal (Exhibit 13).

The preliminary utility plans (Exhibit 13) show a new sanitary sewer manhole installed over the existing 8-inch gravity sewer main and a new 2-inch sanitary force main extended south from the new sanitary sewer manhole through the cul-de-sac of Wright Court. The new 2-inch sanitary force main is then extended south to the intersection of Wright Court and NE 80th Avenue and then west in NE 80th Avenue.

There are three additional 2-inch sanitary force main legs that are extended west at the intersections of Wright Court and NE 81st Avenue; and Wright Court and NE 82nd Avenue. These three (3) legs are shown to dead-end at the sewer lateral to the last Lot on NE 80th Avenue, NE 81st Avenue, and NE 82nd Avenue. All three 2-inch sanitary force main legs are extended to the west property line of the proposed development.

Staff recommends a condition of approval that prior to engineering plan approval, the sanitary sewer utility plans are to be revised to show the 2-inch sanitary sewer force mains in NE 80th Avenue, NE 81st Avenue, and NE 82nd Avenue extended to the westernmost property line of the proposed development.

Per CMC 17.19.040.C.2a Each detach units shall have their own sewer service and STEP or STEF or conventional gravity system as required.

The proposed improvements include 33 new single-family lots, and existing structures will remain part of Lot 34. The preliminary utility plans (Exhibit 13) show the required sewer lateral to each of Lots 1 through 34. The preliminary plans state that each of Lots 1 through 34 will have a sewer lateral to support a grinder pump system. The grinder pump systems are installed with home construction and are to be owned and maintained by the owners of Lots 1 through 34.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant should be required to submit the following:

- Calculations verifying that the sanitary sewer force main is adequately sized for solids and effluent to be pumped up to the existing 8-inch gravity sewer main and the new sanitary sewer manhole in NE 28th Street.
- An odor control system is to be installed at the sanitary sewer manhole that allows for the transition from conventional gravity to sanitary force main.
- All sanitary sewer laterals are to be laid perpendicularly from the mains to the lots.

- Calculations verifying that the pressure sewer laterals, from the grinder pumps to the force main, are adequately sized for solids and effluent.
- Grinder pumps and laterals are to be per the Camas Design Standards Manual (CDSM).

Staff recommends a condition of approval that prior to final plat approval, the following note are to be added to the final plat:

- The grinder pumps for Lots 1 through 34 are to be owned and maintained by the property owners.

Proposed Plat Note:

- The grinder pumps for Lots 1 through 34 are to be owned and maintained by the property owners.

Per the Camas Design Standards Manual (CDSM), General Detail G8, Utility Easements; a minimum 30-foot-wide utility easement is required for three utilities. The proposed 2-inch sanitary force main tapped and extended from the existing 8-inch gravity sewer main in NE 28th Street is one of three utilities; sanitary sewer, water, and storm that are extended from NE 28th Street south via the cul-de-sac on Wright Court.

Staff recommends a condition of approval that prior to final plat approval, a minimum 30-foot-wide utility easement over and under said utility easement is to be shown on the final plat and conveyed to the city for inspections, maintenance, and repairs of said utilities located within the easement.

Demolition permits are issued by the city's Building Department. There are existing structures on the proposed development site. The Department of Ecology submitted a SEPA comment (Exhibit 28) regarding removal of potentially dangerous or hazardous materials.

Staff recommends a condition of approval that prior to issuance of a demolition permit the Building Department requests documentation verifying the applicant has complied with State and County Health Department requirements for disposal of potentially dangerous or hazardous materials.

FINDINGS: Staff finds that, as conditioned, adequate provisions for sanitary sewage disposal can or will be made.

[Existing wells, septic tanks, and septic drain fields]:
Per CMC 17.19.020.A.3 requires abandonment of existing wells, septic tanks, and septic drain fields. Any existing wells, septic tanks and drain fields should be properly decommissioned in accordance with State and County guidelines. If applicable, any water rights associated with the decommissioned well(s) shall be transferred to the City.

Staff recommends a condition of approval that prior to engineering plan approval, any existing wells and/or septic systems, which includes septic tanks and drain fields, are to be decommissioned and documentation should be provided to the city that said wells and/or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

FINDINGS: Staff finds that, as conditioned, adequate provisions for decommissioning existing wells and septic systems can or will be made.

3. Provisions have been made for road, utilities, street lighting, street trees, and other improvements that are consistent with the Six-Year Street Plan, the Camas Design Standards Manual and other State adopted standards and plans;

<u>Roads:</u>

Streets for the proposed development shall be designed in accordance with CMC 17.19.040.B Streets and the Camas Design Standards Manual (CDSM).

The proposed development is located on the south side of NE 28th Street, which is designated as a future 3-lane arterial, per the 2016 Road Designation Comprehensive Plan. Half-width frontage improvements were constructed on the north side of NE 28th Street across from the proposed development. These frontage improvements consisted of curb & gutter, sidewalks, planter strips, and increased paved surfaces.

The proposed development is Phase 2 of The Landing at Green Mountain development. Phase 1 of the Landing at Green Mountain completed that developments frontage improvements on the south side of NE 28th Street in 2024. Phase 2 will take access to NE 28th Street via The Landing at Green Mountain Phase 1, originally approved as Monte Verde.

The Landing at Green Mountain Phase 2 is required to complete the full depth half-width frontage improvement on the south side of NE 28th Street from the existing centerline as part of the proposed development, which includes curb & gutter, sidewalk, planter strip, and increased paved surface on the south side of NE 28th Street.

[Public Roads]:
Per 17.19.040.B.1 half-width street improvements along an existing roadway is required when it is determined to be appropriate by the city engineer. Half-width street improvements on NE 28th Street are required along the frontage of the proposed development.

Per CDSM *Table 2 – General Guidelines for Geometry of a Roadway*, 3-lane collectors/arterials are to consist of a 74-foot right-of-way width, a 46-foot-wide paved street width, 6-foot-wide sidewalk, 5.5 to 7.5-foot-wide planter strip, and no on-street parking permitted on either side.

The preliminary grading plan (Exhibit 14) for the half-width street improvements along the frontage of the proposed development on NE 28th Street, show the full-depth road section beginning at the edge of the existing pavement. As stated in the pre-app notes (Exhibit 2) and in discussing with the applicant, the full depth half width improvements are to be from the existing centerline on NE 28th Street to the back of sidewalk for the proposed development.

The required full depth half width road improvement on NE 28th Street is to abut the full depth half width improvements constructed on the north side of NE 28th Street. The half width improvements are to result in a total 74-foot right-of-way width, 46-feet of paved street width, a 6-foot-wide sidewalk, and an 8-foot-wide planter strip. The additional frontage improvement is to provide sufficient design and construction information regarding the transition to the west between unimproved street widths and improved street widths.

Staff recommends a condition of approval that prior to engineering plan approval, the street improvement and grading plans, along NE 28th Street, are to be revised as follows:

- Full depth half width road improvement from the existing centerline on NE 28th Street, abutting the existing half width full depth improvements constructed on the north side of NE 28th Street.
- Sufficient design and construction information for the taper to the west of the frontage improvements to allow for vehicular transitions from unimprovement pavement to improved pavement.

Per CDSM *Table 3 – Access Spacing Standards*, the access spacing on an arterial is a minimum of 660-feet and a maximum of 1,000-feet.

Per the preliminary plat (Exhibit 12) the proposed development will take access onto NE 28th Street via the existing interior public road, NE 82nd Avenue, that was constructed with The Landing at Green Mountain Phase 1. There for the access spacing on an arterial has been met.

Per CMC 17.19.040.B.5 *Dedication of additional right-of-way may be required for a development when it is necessary to meet the minimum street width standards or when lack of such dedication would cause or contribute to an unsafe road or intersection.*

The existing right-of-way (ROW) width along the frontage of the proposed development is approximately 67-feet. Per the preliminary plat (Exhibit 12) an additional 7-feet of right-of-way width is to be dedicated for the 3-lane arterial consisting of a total right-of-way width of 74-feet.

Staff recommends a condition of approval that prior to engineering plan approval, the street improvement plans are to be submitted with the additional 7-feet right-of-way width dedication on NE 28th Street and street sections in accordance with CDSM Street Detail ST5 3 Lane Collector/Arterial. The applicant is required to construct the 37-foot-wide full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk, from the existing centerline to the back of sidewalk.

[Interior Public Roads]:

Street naming is the responsibility of the Building Official. The street names, as shown on the preliminary plat (Exhibit 12) will be revised per the Building Official. These names are subject to change during the engineering plan review process.

Staff recommends a condition of approval that prior to engineering plan approval, the future public street names are to be revised in accordance to the street names as determined by the Building Official.

Staff recommends a condition of approval that prior to final plat approval, the preliminary plat is to be revised with the final street names as determined by the Building Official.

Per the preliminary plat (Exhibit 12), the interior public roads are proposed to be constructed with two separate right-of-way widths.

Per CDSM Table 2 – General Guidelines for Geometry of a Roadway, there are two road sections for a 2-lane local neighborhood road:

- The local neighborhood road section with a 60-foot-wide right-of-way width, a 36-foot paved surface, 5-foot-wide detached sidewalks and 5 to 6-foot planter strips on both sides, and on-street parking permitted on both sides.
- The local neighborhood road section with a 52-foot-wide right-of-way width, a 28-foot paved surface, 5-foot-wide detached sidewalks and 5 to 7-foot planter strips on both sides, and on-street parking permitted on one side only. The street section requires approval from the city engineer.

<u>Proposed N 82nd Avenue - Extension</u>

The preliminary plat (Exhibit 12) proposes to construct the extension of the existing N 82nd Avenue, from the eastern property line to the western property line of Parcel No. 173169000. This road section is shown to consist of the 60-foot right-of-way width, with the 36-foot paved surface, planter strip and detached sidewalk on both sides of N 82nd Avenue in accordance with CDSM Table 2 – General Guidelines for Geometry of a Roadway, 2-lane local neighborhood road with 60-foot right-of-way width.

Staff recommends a condition of approval that prior to engineering plan approval a complete set of street improvement plans are to be submitted with the future N 82nd Avenue constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (60' ROW).

Proposed Wright Court, N 80th Avenue and N 81st Avenue

The preliminary plat (Exhibit 12) proposes to construct these two future roads with a 52-foot right-of-way width, a 28-foot paved surface, planter strips and detached sidewalks on both sides of Wright Court, N 80th Avenue, and N 81st Avenue in accordance with CDSM Table 2 – General Guidelines for Geometry of a Roadway, 2-lane local neighborhood road with 52-foot right-of-way width. The city engineer is in support of the proposed 52-foot right-of-way section as shown.

Staff recommends a condition of approval that prior to engineering plan approval a complete set of street improvement plans are to be submitted with the future Wright Court, N 80th Avenue, and N 81st Avenue constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (52' ROW).

Per CMC 17.19.040.B.12.e *curb return radii shall be no less that thirty-five feet on arterial and collector streets, and no less than twenty-five feet on all other streets.*

Staff recommends a condition of approval that prior to engineering plan approval, the site improvement plans are to be submitted with the minimum 25-foot curb radii on both sides of the road at the intersections of future N 82nd Avenue and Wright Court; Wright Court and N 81st Avenue; and the inside curb radii at the intersection of Wright Court and N 80th Avenue.

Staff recommends a condition of approval that prior to final plat approval, the preliminary plat is to be revised and submitted with the minimum 25-foot curb radii on both sides of the road at the intersections of future N 82nd Avenue and Wright Court; Wright Court and N 81st Avenue; and the inside curb radii at the intersection of Wright Court and N 80th Avenue.

Per CMC 17.19.040.B.10.b.i Block lengths shall not exceed the maximum access spacing for the roadway class per the city's Design Standards Manual. The maximum block length for a local roadway classification is 600-feet. ***The north end of proposed Wright Court exceeds the interior maximum 600-foot block length standard for a local roadway classification, however, the city engineer in support the deviation from the standard.***

Per CMC 17.19.040.B.10.b.ii Cul-de-sacs and permanent dead-end streets over three hundred feet in length may be denied unless topographic or other physical constraints prohibit achieving this standard.

Per the preliminary plat (Exhibit 12) the north end of future Wright Court, from the intersection with N 82nd Avenue, is approximately 600-feet in length, which exceeds the maximum 300-feet for a permanent dead-end cul-de-sac standard. ***The city engineer is in support of the deviation from this standard as an access to NE 28th Street in this location would not have been supported.***

Per CMC 17.19.040.B.10.b.iii When cul-de-sacs or dead-end streets are permitted that are over three-hundred feet, a direct pedestrian and bicycle connection shall be provided to the nearest available street or pedestrian oriented use. Pedestrian connections need to meet Design Standards Manual for ADA accessibility in accordance with PROWAG and ADAAG.

Staff recommends a condition of approval that prior to engineering plan approval, the site improvement plans are to be submitted with the minimum 25-foot curb radii on both sides of the road at the intersections of future N 82nd Avenue and Wright Court; Wright Court and N 81st Avenue; and the inside curb radii at the intersection of Wright Court and N 80th Avenue.

Staff recommends a condition of approval that prior to final plat approval, the preliminary plat is to be revised and submitted with the minimum 25-foot curb radii on both sides of the road at the

intersections of future N 82nd Avenue and Wright Court; Wright Court and N 81st Avenue; and the inside curb radii at the intersection of Wright Court and N 80th Avenue.

[Private Roads – Tract B Parking Stalls]:
Per the preliminary plat (Exhibit 12), there are not any private roads proposed for this development. However, there are private parking stalls shown on Tract B on the east side of future Wright Court.

There are seven (7) parking stalls shown located behind the sidewalk and adjacent to the curb ramps on the southeast corner of the intersection of N 82nd Avenue and Wright Court. There aren't any dimensions provided for depth and width, however, the stall depths, minimum 18-feet, are to be located behind the future right-of-way and the required 6-foot PUE. Additionally, the stalls should not exceed six (6) stalls, located as far to the south as possible, and away from the southeast curb ramp.

Staff recommends a condition of approval that prior to engineering plan approval, the site improvement plans are to be submitted with design information, depth and width, for the private parking stalls shown on Tract B at the southeast corner of the intersection of N 82nd Avenue and Wright Court. The stall depths, minimum 18-feet, are to be located behind the future right-of-way and the required 6-foot PUE. Additionally, the stalls should not exceed six (6) stalls, located as far to the south as possible, and away from the southeast curb ramp.

Staff recommends a condition of approval that prior to final plat approval, the preliminary plat is to include a plat note stating that the private parking stalls on Tract B are to be owned and maintained by the Homeowners Association (HOA)/homeowners.

Proposed Plat Note:

- Tract B contains a private parking area that is to be owned and maintained by the Homeowners Association (HOA)/homeowners.

<u>Utilities, Street Lighting, Street Trees, and Other Improvements</u>:

[Street lighting]:
LED Street lighting is to be designed and installed along all street frontages in accordance with the Camas Design Standards Manual (CDSM) – Standards for Street Lighting.

The locations for streetlights are to be coordinated with the locations of other site features, such as street trees, driveways, and other utilities. Per CDSM, private streets in excess of 100-feet in length and serving more than five dwelling units are required to have streetlights. There aren't any private streets proposed for this development.

Staff recommends a condition of approval that prior to engineering plan approval all streetlight locations are to be shown on the utility plans and landscape plans.

Staff recommends a condition of approval that prior to submitting electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street Trees and Landscaping]:
CMC 17.19.030 (F1) requires one 2-inch diameter street tree in the planter strip for each dwelling unit. The preliminary landscape plan shows each proposed lot is provided with at least one street tree.

Staff recommends a condition of approval that prior to final acceptance all landscaping be installed or bonded for, and all proposed street trees and landscaping are to be per the CDSM Landscape Standards Plant Materials list.

Staff recommends a condition of approval that prior to final engineering approval, the applicant is required to show proposed driveway locations for each lot to ensure that street trees are not impacted.

The street tree plantings and other landscaping as discussed throughout this report, should be included on the landscaping plans with final engineering plan submittal for the site improvements.

Staff recommends a condition of approval that prior to engineering plan approval, the applicant is to submit a final landscape plan for review and approval that is consistent with the landscaping standards in CMC Chapter 18.13, in addition to CMC Chapter 17.19.030.F.6, and include plantings from the City's approved plant list.

Landscaping adjacent to or within tracts should be installed prior to final acceptance per CMC 17.19.030.F.3. Street trees adjacent to lots should be installed prior to final occupancy or bonded for per CMC 17.19.030.F.4.

[Storm Facility Landscaping]:
CMC 17.19.030.F.6 requires that storm drainage facilities within 30-feet from any street or accessory structure to be landscaped with a 10-foot L2 buffer. The proposed storm facility located in Tract D should be landscaped with a L2 buffer at its lot lines and the landscaping should be shown on the final landscape plans.

Per the CDSM, the storm facilities are to be fenced with a maximum height 6-foot fence with top rail and a minimum 10-foot-wide double gate for access. The preliminary stormwater plans do not provide fencing or gated access to the future stormwater facility located on Tract A.

Staff recommends a condition of approval that prior to engineering plan approval the applicant is to submit revised stormwater facility plans that provide for a minimum 6-foot-high black vinyl coated chain link fence with top rail installed along the north, east, and west property lines of Tract A where the tract abuts the future Lot 25 and the access road to the storm facility. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the access road to the facility and a minimum 4-foot-wide man gate.

FINDING: Staff finds that, as conditioned, the applicant can or will make adequate provisions as conditioned for roads, utilities, street lighting, street trees, and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans.

4. Provisions have been made for dedications, easements, and reservations;

The applicant is conditioned to dedicate the minimum 7-foot right-of-way width on NE 28th Street required for the proposed frontage improvements, the 60-foot right-of-way widths, and the 52-foot right-of-way widths for the internal public roads required to serve the proposed development, as shown on the preliminary plat.

Proposed Tract A is identified as the stormwater facility, that also includes a protected Oregan White Oak on the preliminary plat. A paved access road is located in Tract A that allows access for maintenance and inspections of the stormwater facility located in Tract A. There is to be a public pedestrian access easement over the private driveway located in Tract A that will allow for pedestrian access to the required T-29 pedestrian trail that runs west-to-east through the Open Space located in a south portion of the development.

A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make

provisions in the CC&Rs for ownership and maintenance of the storm drainage facilities located on Tract A; any fencing, walls, landscaping, irrigation systems, the private parking spaces in Tract B, and outside of the City's right-of-way. Further, all necessary easements and dedications should be noted on the final plat.

> **FINDING:** Staff finds that, as conditioned, adequate provisions for dedications, easements and reservations can or will be made by the applicant at the time of final platting.

5. The design, shape, and orientation of the proposed lots are appropriate to the proposed use.

CMC 18.09.040 Table 1 Lot Dimensional Standards

The subject property is situated in the R-7.5 - Single-Family Residential zone which permits a minimum lot size of 6,000 square-feet, a maximum lot size of 12,000 square-feet, and an average lot size of 7,500 square-feet. The maximum density for the R-7.5 zone is 5.8 dwelling units per acre.

As per CMC 18.09.060.C, density transfer standards are permitted to be used when a land division proposed to set aside a tract for the protection of critical area, natural open space, natural open space network or network connector, or a recreational area is set aside within a proposed development. As noted in the project Narrative, the applicant is proposing to utilize density transfer standards and is requesting smaller lot sizes and reduced setbacks due to the open space dedication as shown on the preliminary plat. The proposed plat shows Tracts "A" and "B", totaling approximately 0.84 acres in size, are set aside for open space tracts. Tract "A" is located in the southern portion of the project area, is approximately 36,530-square-feet in size and includes stormwater facilities, Oregon white oak dripline, and a T-29 trail connection. Tract "B" is centrally located within the proposed subdivision, near the intersection of Wright Court and N 82nd Avenue, and is shown to include 7 parking spaces.

As noted in section 18.09.060.D, where a recreational tract includes at least 0.5 acres of contiguous area, the city may provide additional or negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards under CMC 18.09.040, Table 1 and 2. The applicant is proposing lots that range in size from 5,000 – 41,512 square-feet, with an average lot size of 5,824 square-feet and a proposed density of 3.62 dwelling units per acre. The applicant is requesting additional flexibility per section 18.09.060.D to allow for a minimum lot width of 50-feet where typically the minimum lot width in the R-7.5 zone with a density transfer bonus would be 60-feet.

The applicant proposes the subdivision be reviewed under the density transfer standards due to the fact that the preliminary plan includes critical areas and recreational amenities including a trail and picnic benches. The project Narrative indicates the site's critical area, including wetland buffers and Oregon white oak trees, are proposed to be retained within the open space tract. The applicant is requesting flexibility in the following Code requirements:

- Reduced average lot size of 5,824 square-feet
- Reduced minimum lot size of 5,000 square-feet
- Reduced minimum lot width of 50-feet
- Reduced minimum garage setback of 20-feet
- Reduced minimum rear setback of 15-feet
- Increased lot coverage of 55% for single-story homes and 50% for two-story homes

The applicant's narrative states "the proposed requests are reasonable, and the minimum required to attain the allowed density on the project site while still providing a mix of marketable homes. The reductions stated above are proposed to replace the standards of Camas Municipal Code 18.09.040. In return for flexibility to lot standards the applicant will provide trails and picnic tables within the recreational open space. Pedestrian paths are proposed to be stubbed to the east and west to be

extended with future development. Landscaping will be provided within the park area and will support a range of recreational activities."

Staff appreciates the applicant's project narrative and justifications for allowing development flexibility but has concerns related to the quality of the open space being provided for the proposed subdivision as the amenities discussed in the project narrative are not shown on the preliminary plans. The preliminary plat shows Tract "A" to include the stormwater facilities for the entire tract, which takes up a large portion of the proposed 36,530 square-feet of "open space" area as well as a wetland buffer, a trail connection, and an oak dripline. Typically, stormwater facilities are required to be fenced in with no access to the public for recreational purposes and for this reason, the area cannot be considered as useable open space for recreational activity. Tract "B" proposed at approximately 9,775 square-feet is situated within the Bonneville Power Authority easement area and includes 7 parking spaces with no other recreational amenities shown on the plans at this time, although the project narrative notes there will be picnic benches in this area. Staff is supportive of density transfer flexibility as it provides variety in housing options within the city, however as currently proposed, it is difficult to see if there is a net useable 0.5-acre area of pen space to meet the intent of CMC 18.090.060.D since a majority of the open space area in Tract "A" is encumbered with the stormwater facility. A condition of approval will be included that recommends the applicant provide additional details to show how these areas will be developed in a way that provides additional enhancement and useability for the community once the subdivision is developed.

<u>CMC 18.09.040 Table 2 Setbacks</u>

The applicant's narrative includes the tables below to illustrate the proposed density transfer requests with respect to CMC 18.09.040 – Density and Dimensions as well as Building Setbacks for Single-Family Residential Zones:

Table 1 – Density and Dimensions for Single-family Residential Zones			
	R-7.5	**Density Transfer**	**Proposed**
Maximum density (dwelling units/net acre)	5.8	5.8	3.62
Average lot area (square feet)	7,500	-	5,824**
Minimum lot size (square feet)	6,000	5,250	5,000*
Maximum lot size (square feet)	12,000	9,000	41,512***
Minimum lot width (feet)	70	60	50*
Minimum lot depth (feet)	90	80	100'
Maximum building lot coverage	40%	40%	50%, 55% for single level homes*
Maximum building height (feet)	35	35	35

* Additional flexibility requested per CMC 18.09.060.D
**Excluding 1.9 acre parent parcel
***One time exception for parent parcel

Table 2 – Building Setbacks for Single-family Residential Zones	
Minimum front yard	**20'***
Minimum side yard	5'
Minimum side yard flanking a street and corner lot rear yard	10'
Minimum rear yard	**25'***
Maximum lot frontage on a cul-de-sac or curve	30'

*Additional flexibility requested per CMC 18.09.060.D

The applicant's narrative states the proposed subdivision meets the intent of the zoning code and would result in an overall benefit for the public and future residents of the community and that the proposal achieves the desired density for the area which will help to meet housing goals for the City.

6. The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;

CMC 18.13.045 and CMC 18.13.051 Tree Density/Tree Survey:
A minimum of 20 tree units (TU) per net developable acre is required for residential developments per *CMC 18.13.051(A) Table 1 – Required Tree Density* and should be incorporated into the overall landscape plan. The net acreage of the site is 11.67 acres, thus requiring 233 tree units. A tree plan prepared by Arbor Science Tree Care, dated May 2, 2025 (Exhibit 7) was included in the preliminary plans for the proposed project and indicates the current tree unit density is 999 tree units, with the proposed removals calculating out to 326 tree units, leaving a net density of 673 tree units to be preserved within the 11.67-acre site. The preliminary landscape plan shows the site area at 9.59 acres with a total of 192 tree units required with existing tree units at 204 and an additional planting of 77 tree units, bringing the total tree units upon completion at 281, which exceeds the minimum tree density requirements. is in excess of the minimum required tree units. While there are some discrepancies in the information the applicant provided, staff believes that the tree plan included the overall square-footage of the parcels within the subdivision where the preliminary landscape plan only includes the actual area to be developed. The tree density is met by retaining some of the existing trees, providing the required street trees, and in plantings within the proposed tract areas. Staff finds the proposed landscape plan meets the minimum tree density.

As per CMC 18.13, the applicant is required to submit a final landscape, tree, and vegetation plan to the City for review and approval prior to engineering plan approval. Plants utilized will need to be per the approved City's Tree list and per the Camas Design Manual planting specifications and landscape notes. For plants not on the approved City list, a characteristic card should be submitted to the City for review and approval. Irrigation and landscaping should be installed or bonded for prior to final acceptance per CMC 17.19.030.F.3.

CMC Section 18.17.060 Retaining Walls:
The proposed site plan shows a retaining wall located in the northeast corner of the site, along NE 28th Avenue but no detail has been provided as to height or length. CMC 18.17.060 allows for retaining walls up to 6 feet unless approved by the Director. The proposed retaining wall will be required to meet the standards as noted.

CMC Chapter 18.34 Airport Overlay Zoning:
The subject property is located within the Airport Overlay Zone C. Staff recommends a condition of approval that an avigation easement is required to be recorded on the title that provides notice that the property is located within an air traffic area per CMC 18.34.020.B and included as a note on the final plat. Prior to building permit submittal, the applicant should consider construction techniques that would decrease the noise associated with the airport per CMC 18.34.080.A and conditioned as such.

7. Appropriate provisions are made to address all impacts identified by the transportation impact study;

[Traffic Impact Analysis]:
Per CMC 18.18.040.E a Transportation Impact Analysis (TIS/TIA) may be required when a development will generate 200 or greater average daily trips (ADTs). The proposed development will generate approximately 302 ADTs, 292 of which are the number of net new ADTs, which triggered the requirement for a TIA.

A transportation impact analysis (TIA) (Exhibit 3) dated April 23, 2025, was prepared by Lancaster Mobley for the 9.6 acre site for the proposed development of up to 32 single-family-homes. The report used the trip generation rates from the *ITE Trip Generation Manual* (11th Edition, 2021), ITE code #210 Single-Family Detached Housing, to determine the number of trips generated per weekday. There is an existing single-family residence, therefore the trip generation calculations show that the proposed project is estimated to have a new net increase in trip generation of 21 AM Peak Hour trips (6 In / 15 Out), 29 PM Peak Hour trips (18 In / 11 Out), and a total of 292 average daily trips (ADTs).

Sight Distance Analysis
The proposed development improvements will not take direct access onto NE 28th Street. Access to NE 28th Street will be the previously approved and constructed Landing at Green Mountain 1. Therefore, a site distance analysis for the proposed Landing at Green Mountain 2 was not required. ***Staff Concurs.***

Traffic Signel Warrants
Preliminary traffic signal warrants discussed in the TIA (Exhibit 3, page 18) were examined for the unsignalized study intersections to determine whether the installation of a new traffic signal will be warranted at the intersections by the 2027 site buildout year. Based on the preliminary analysis following a review of *Warrant 1 in the Manual on Uniform Traffic Control Devices, or MUTCD*, traffic signal warrants are not projected to be met at any of the unsignalized study intersections by the 2027 site buildout year. The study determined that '*… no new traffic signals are necessary or recommended as part of the proposed development application*.' ***Staff concurs.***

All-Way Stop-Control Warrants
Stop-Control warrants are adequately discussed in the TIA (Exhibit 3, pages 23 & 24). The applicable study intersections were evaluated and reviewed per the *Manual of Uniform Traffic Control Devices for Streets and Highways (MUTCD), Section 2B.12 All-Way Stop Control.*

The review of all-way stop-control warrants determined that '*… the installation of all-way stop-controls at any of the applicable study intersections by the 2027 site buildout year is not necessary or recommended. Therefore, no all-way stop-control mitigation at the study intersections is recommended as part of the proposed development.*' ***Staff concurs.***

Intersection Queuing Analysis
The TIA (Exhibit 3, pages 23-25), thoroughly discuss the results of the queuing analysis that was conducted in accordance with the City of Camas Engineering Design Standards, at the previously determined study intersections to determine whether sufficient storage is available at applicable turning movements to accommodate projected queues.

The queue lengths were projected based on the results of a Synchro/SimTraffic simulation, with the reported values representing the 95th percentile queue length. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

The analysis determined that '*…based on the queuing analysis, the northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. This extended queuing is projected to occur under the year 2027 analysis scenarios during the PM peak hour, with or without buildout of the proposed development. The maximum 95th percentile is projected to be approximately 175 feet, where the available striped storage area is approximately 115 feet. Although the 95th percentile queue may exceed the available striped storage area by approximately 60 feet (i.e., the length of 2 to 3 passenger cars), this excess queue*

can be accommodated by the northeast bound through lane, which experiences a 95th percentile queue of up to 150 feet for a total of 210 feet of queuing along the through lane. This 210-foot queue will not extend back to any other public intersection or driveway along NE Goodwin Road, whereby limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development.' ***Staff Concurs.***

The conclusions noted in the Transportation Impact Analysis (Exhibit 3, page 25) are as follows:

CONCLUSIONS

- *The proposed development is projected to impact on nine of the transportation facilities where proportionate share fees are being collected by the City of Vancouver. The proposed development application will need to contribute a proportionate share fee of $28,949.00 toward these transportation improvement projects.* ***Staff concurs. A condition of approval is warranted.***
- *No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.* ***Staff Concurs.***
- *Traffic signal and all-way stop-control warrants are not projected to be met at any of the applicable study intersections under any analysis scenario through the 2027 site buildout year. Accordingly, no revisions to traffic controls are necessary or recommended as part of the proposed Landing at Green Mountain Phase 2 project.* ***Staff Concurs.***
- The proposed development will reconstruct its associated street frontage with NE 28th Street to include pedestrian and bicycle facilities in accordance with City of Camas Street standards. Additionally, appropriate pedestrian and bicycle facilities will be constructed within site internal streets to accommodate student pickup/drop-off via school bus. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Landing at Green Mountain Phase 2 subdivision, and no further mitigation to pedestrian and bicycle facilities are necessary and recommended. ***Staff Concurs.***
- All study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application. ***Staff Concurs.***
- The proposed development will reconstruct its associated street frontage with NE 28th Street to include pedestrian and bicycle facilities in accordance with City of Camas Street standards. Additionally, appropriate pedestrian and bicycle facilities will be constructed within site internal streets to accommodate student pickup/drop-off via school bus. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Landing at Green Mountain Phase 2 subdivision, and no further mitigation to pedestrian and bicycle facilities are necessary and recommended. ***Staff Concurs.***
- All study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application. ***Staff Concurs.***

- The northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. However, this excess queue can be accommodated by the northeast bound through lane without extending back to any other public intersection or driveway along NE Goodwin Road. Limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur due to this queuing. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development. ***Staff Concurs.***

[City of Vancouver Proportionate Share Projects]

The applicant's TIA was to evaluate the number of PM Peak Hour trips through City of Vancouver identified proportionate share intersections in order to help fund intersection improvement projects. Based on Table 4, page 10 of the TIA, dated April 23, 2025, the proportionate share fees to the City of Vancouver will be as follows:

Proportionate Share Project Name	**Fee Rate**	**Number of Trips**	**Proportionate Share Cost**
NE Fourth Plain Blvd. at NE 152nd Ave. (Signal)	$333.00 per PM peak hour trip	3	$999.00
SE 192nd Ave & NE 13th Street	$400 per PM peak hour trip	13	$5,200.00
SE 192nd Ave & SE 34th St	$150 per PM peak hour trip	3	$450.00
SE 192nd Ave & WB SR-14 ramps	$2,000 per PM peak hour trip	2	$4,000.00
NE 172nd Avenue at NE 18th Street	$300 per PM peak hour trip	3	$900.00
NE 179th Place at NE 18th Street	$9,00 per PM peak hour trip	3	$2,700.00
NE 187th Avenue at NE 18th Street	$1,200 per PM peak hour trip	4	$4,800.00
NE 192nd Avenue at NE 9th Street	$1,100 per PM peak hour trip	8	$8,800.00

NE 187th Avenue at SE 1st Street	$1,100 per PM peak hour trip	1	$1,100.00
Total Proportionate Share Cost (COV proportionate share intersections with zero (0) PM peak hour trips are included in the TIA, Table 4, page 10)			**$28,949.00**

Staff recommends a condition of approval that prior to final acceptance the applicant is required to pay the proportionate share amount of $28,949.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

FINDING: Staff finds that this development, as conditioned, can or will meet any impacts identified by the transportation impact study.

8. Appropriate provisions for maintenance of commonly owned private facilities have been made;

Per CMC 14.02.090.A.1 Stormwater facilities, located within residential subdivisions and short plats, shall be the maintenance responsibility of the applicant for two-years after the date of final acceptance. This maintenance period shall run concurrently with the city's required two-year warranty period that begins at final acceptance.

Per CMC 14.02090.C, the City shall have the right-of-entry and authority to inspect stormwater facilities for compliance with this chapter. A note is to be added to the final plat granting the city right-of-entry for inspection purposes of the stormwater facilities on Tract A. A condition of approval is warranted.

Per CMC 17.19.040.A.2 the HOA and/or homeowners are responsible for the ownership and maintenance of the private streets. A note is to be added to the final plat stating that private Tract B 'Parking Stalls are to be owned and maintained by the individual property owners and/or homeowners association (HOA). A condition of approval is warranted.

FINDING: Staff finds that, as conditioned, this development can or will meet the appropriate provisions for maintenance of private facilities.

9. Appropriate provisions in accordance with RCW 58.17.110, are made for (a) the public health, safety, and general welfare, and (b)The public use and interest will be served by the platting of such subdivision and dedication.

FINDING: As discussed throughout this report, staff finds that the subdivision can be conditioned to provide the appropriate provisions for public health, safety, general welfare, and assure the public interest is served.

10. The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state, and local environmental acts, and ordinances in accordance with RCW36.70B.030.

FINDINGS: Staff concurs that the proposed subdivision can or will meet the requirements of RCW 58.17 and other applicable state and local laws that are in at the time of final platting. The final plat will be processed in accordance with the requirements of CMC 17.21.060.

PUBLIC COMMENTS

As of the writing of this staff report, staff received written public comments from the Department of Ecology (Exhibit 28) regarding solid waste management and water quality, Washington Department of Fish and Wildlife (WDFW) regarding existing Oregon white oak trees located onsite (Exhibit 30), and the Cowlitz Indian Tribe (Exhibit 29) regarding the site being located within the Tribe's area of concern. These comments are addressed throughout the staff report.

CONCLUSION

Based on the above findings and discussion provided in this staff report, staff concludes that The Landing at Green Mountain 2 Subdivision (SUB25-1006) should be approved because it does comply with the applicable standards if all the conditions of approval are met.

RECOMMENDATION

Staff recommends APPROVAL of the preliminary plat of "The Landing at Green Mountain 2" Subdivision (SUB25-1006) subject to the following conditions of approval:

CONDITIONS OF APPROVAL

Standard Conditions:

1. Engineering site improvement plans shall be prepared in accordance with the City of Camas Design Standards Manual (CDSM), which includes the North Shore Design Standards, and CMC 17.19.040.
2. The engineering site improvement plans shall be prepared by a licensed civil engineer in Washington State and submitted to the City's Community Development Engineering Department for review and approval.
3. Per CMC 17.19.040.C.1 and 1.a: All utilities designed to serve the development shall be placed underground. Those utilities to be located beneath paved surfaces, including all service connections, shall be installed prior to application of any surface materials.
4. The installation of public improvements shall be in accordance with CMC 17.21 Procedures for Public Improvements.
5. After the land-use decision is issued, the applicant is to submit the Civil construction plans via the online portal at *www.cityofcamas.us/Permits/Civil Construction Application*.
6. Community Development (CDEV) Engineering shall collect a total 3% plan review and construction inspection (PR&CI) fee for the proposed development.
    a. Payment of the 1% plan review (PR) fee is required prior to start of initial plan review. Staff will review the preliminary engineer's estimate and invoice the applicant via the online portal.
    b. Payment of the 2% construction inspection (CI) fee is required prior to final plan approval. Staff will invoice the applicant via the online portal.
    c. Under no circumstances will the applicant be allowed to begin land-disturbing activities prior to engineering plan approval.
7. If applicable, existing wells, septic tanks, and septic drain fields shall be decommissioned in accordance with state and county guidelines per CMC 17.19.020.
8. Prior to any land-disturbing activities of an acre or more, the applicant shall submit a copy of the *NPDES General Construction Stormwater Permit* (GCSWP), which is issued by the Washington State

Dept. of Ecology, and the *Stormwater Pollution Prevention Plan* (SWPPP), which is required as a component of the NPDES GCSWP permit.

9. Prior to commencing any land-disturbing activities of an acre or more, the applicant shall submit an Erosion Control Bond in the amount of 200% of the cost for erosion control (ESC) measures, per CMC 14.06.200. Staff will provide a letter to the applicant with the required ESC amount.
10. If any item of archaeological interest is uncovered during a permitted land-disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
11. The applicant shall comply with the recommendations of the geotechnical report (Exhibit 4) prepared by True North Geotechnical, dated June 2025 to minimize any potential hazards associated with construction.
12. Any entrance structures or signs proposed or required for this project will be reviewed and approved by the city.
    a. All designs will be in accordance with applicable City codes.
    b. The maintenance of the entrance structure will be the responsibility of the homeowners.
13. Final plat submittals shall meet the requirements of the CMC 17.11.060, CMC 17.01.050, and the Camas Design Standards Manual.
14. A homeowner's association (HOA) will be required and a copy of the CC&Rs for the development will need to be submitted to the City for review and approval. Specifically, the applicant will need to make provisions in the CC&Rs for ownership and maintenance of the private storm drainage systems, open spaces, retaining walls, fencing, walls, landscaping, irrigation, private roads, and tracts or easements outside of the City's right-of-way if applicable. Further, all necessary easements and dedications should be noted on the final plat.
15. Provisions for parking enforcement on private Tracts/access driveways, acceptable to the Fire Marshal, shall be included in the CC&Rs at the time of final platting.
16. Prior to final acceptance, the applicant shall remove all temporary erosion prevention and sediment control measures from the site at completion of all site improvements, which includes stabilization of all disturbed soil.
17. As a component for final acceptance, final as-built construction drawing submittals shall meet the requirements of the Camas Design Standards Manual (CDSM).
    a. The as-built cover sheet is to be the originally approved cover sheet signed by the City Engineer.
    b. As-builts are to be submitted as PDFs.
    c. As-builts are to be submitted in either AutoCad or Carlson formats.
18. Per CMC 17.21.050.B.2 and prior to final acceptance a 2-year warranty maintenance bond is to be submitted for all public improvements.
    a. Per CMC 17.21.070.A Upon final acceptance of the development improvements the two-year (2) warranty bond commences.
19. Per CMC 17.21.070.E A letter of final acceptance will be issued once all items listed in 17.21.070.B-C have been completed and approved by the city.
20. Per CMC 18.18.070.B, prior to the issuance of final occupancy permits, all public and private improvements shall be completed in accordance with CMC 17.21.070 Final Acceptance.

21. Automatic fire sprinklers installed per NFPA 13D or 13R shall be required in all new residential structures.
22. The applicant will be responsible for maintenance of all private improvements, including but not limited to stormwater facilities Tracts and easements, Open Space Tracts, parking areas, landscaping and irrigation, and any retaining walls.
23. Per CMC 17.21.060.H Permits for one sales office and/or one model home per plat or phase may be issued after the final plat is recorded, and prior to final acceptance. Building permit applications for any other residential buildings will not be accepted until after final acceptance.
24. At the time of building permit approval, the applicant shall pay the appropriate impact fees in accordance with the provisions of CMC 3.88.
25. The applicant shall take appropriate measures to ensure landscaping success for a minimum of three years after issuance of Certificate of Occupancy. If plantings fail to survive, the property owner shall promptly replace them.
26. Unless construction of this site commences within five (5) years of issuance of this decision, this permit will expire.

Special Conditions of Approval:

Planning:

27. The recommendations provided by the Department of Ecology shall be complied with.
28. The recommendations in the geotechnical report shall be followed.
29. If potential artifacts are discovered during construction, work must immediately cease, and both the State Department of Archaeological and Historic Preservation and the City shall be notified.
30. The applicant shall be required to submit an Inadvertent Discovery Plan as recommended by the Cowlitz Indian Tribe.
31. The Mitigation Plan contained in the Critical Areas Report & Oregon White Oak Mitigation Plan prepared by Ash Eco Solutions, LLC shall be followed.
32. The installation of temporary construction fencing prior to construction that clearly marks in the field critical area buffers (i.e., Oregon White Oak) and fencing should remain throughout permitted construction activities.
33. The trees identified for preservation shall comply with the tree protection recommendations contained in the Critical Areas report. Any required revisions to the site plan, such as building setbacks and/or site improvements, will require an updated Tree Survey for review and approval prior to Engineering Plan approval and will be conditioned as such.
34. Exterior retaining walls facing the public right-of-way shall be “set back a distance of one foot for every foot in height of a fence in excess of allowed height” per CMC 18.17.060.D. and provide additional landscaping consisting of groundcover, shrubs, and trees.
35. The applicant should consider construction techniques that would decrease the noise associated with the airport per CMC 18.34.080.A

<u>Prior to Engineering Plan Approval:</u>

Planning:

36. A detailed construction drawing per CMC 16.53.050.E.3 is to be submitted to the City for review and approval Retaining walls shall comply with CMC 18.17.060.D.

37. A final landscape, tree, and vegetation plan consistent with the landscaping standards in CMC Chapter 18.13 should be submitted to the City for review and approval prior to engineering plan approval. The final landscape plan shall include additional details for open space enhancements that provide benefit to the community. Plants utilized will need to be per the approved City's Plant list and per the Camas Design Manual planting specifications and landscape notes. For plants not on the approved City list, a characteristic card should be submitted to the City for review and approval. Irrigation and landscaping should be installed or bonded for prior to final acceptance per CMC 17.19.030.F.3.

Engineering*:*

[Water]

38. The applicant shall work with engineering and the Fire Marshal's Office to determine if an additional fire hydrant is required on future N 80th Avenue or future N 81st Avenue.

39. The applicant shall submit revised water utility plans showing the locations of all proposed irrigation services and the size of each irrigation meter.

[Storm Drainage]

40. The applicant shall submit a complete set of stormwater plans, including the design for the collection and conveyance system in accordance with the Camas Design Standards Manual (CDSM); and a complete set of the design plans for the stormwater detention and treatment system, per MR #1 of the TIR.

41. The stormwater plans are to be revised with any and all proposed treatment structures, including treatment manholes; and detention structures located outside of the public right-of-way.

42. The applicant shall submit document of the maintenance requirements for the stormwater treatment structures, as the stormwater facilities located in Tract A are to be owned and maintained by the Homeowners Association (HOA)/homeowners.

43. The applicant shall submit a revised stormwater plan for Lots 1-34. Said plan should ensure that adjacent parcels and downstream drainageways and/or adjacent properties are not negatively affected by roof drain downspouts and surface water runoff, per Camas Municipal Code (CMC) 14.02 and 17.19.040.C.

[Erosion Control]

44. The applicant shall be required to submit a complete set of Erosion Sediment Control (ESC) plans, as a part of the site improvement plans for review and approval.

[Sanitary Sewer Disposal]

45. The sanitary sewer utility plans are to be revised to show the 2-inch sanitary sewer force mains in NE 80th Avenue, NE 81st Avenue, and NE 82nd Avenue extended to the westernmost property line of the proposed development.

46. The applicant shall be required to submit the following:
    a. Calculations verifying that the sanitary sewer force main is adequately sized for solids and effluent to be pumped up to the existing 8-inch gravity sewer main and the new sanitary sewer manhole in NE 28th Street.

b. An odor control system is to be installed at the sanitary sewer manhole that allows for the transition from conventional gravity to sanitary force main.
c. All sanitary sewer laterals are to be laid perpendicularly from the mains to the lots.
d. Calculations verifying that the pressure sewer laterals, from the grinder pumps to the force main, are adequately sized for solids and effluent.
e. Grinder pumps and laterals are to be per the Camas Design Standards Manual (CDSM).

47. Prior to issuance of a demolition permit the Building Department requests documentation verifying the applicant has complied with State and County Health Department requirements for disposal of potentially dangerous or hazardous materials.

[Existing wells, septic tanks, and septic drain fields]

48. Any existing wells and/or septic systems, which includes septic tanks and drain fields, are to be decommissioned and documentation should be provided to the city that said wells and/or septic systems have been properly decommissioned in accordance with State and County guidelines. Additionally, any water rights associated with a decommissioned well shall be transferred to the City.

Roads:
[Public Roads]

Existing NE 28th Street

49. The street improvement and grading plans, along NE 28th Street, are to be revised as follows:
    a. Full depth half width road improvement from the existing centerline on NE 28th Street, abutting the existing half width full depth improvements constructed on the north side of NE 28th Street.
    b. Sufficient design and construction information for the taper to the west of the frontage improvements to allow for vehicular transitions from unimprovement pavement to improved pavement.

50. The street improvement plans are to be submitted with the additional 7-feet right-of-way width dedication on NE 28th Street and street sections in accordance with CDSM Street Detail ST5 3 Lane Collector/Arterial. The applicant is required to construct the 37-foot-wide full depth half-width street improvement, including a minimum of 23-feet of paved surface, curb & gutter, 8-foot planter strip, and 6-foot detached sidewalk, from the existing centerline to the back of sidewalk.

[Interior Public Roads]:

51. The future public street names are to be revised in accordance to the street names as determined by the Building Official.

52. A complete set of street improvement plans are to be submitted with the future Wright Court, N 80th Avenue, and N 81st Avenue constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (52' ROW).

53. The site improvement plans are to be submitted with the minimum 25-foot curb radii on both sides of the road at the intersections of future N 82nd Avenue and Wright Court; Wright Court and N 81st Avenue; and the inside curb radii at the intersection of Wright Court and N 80th Avenue.

Proposed N 82nd Avenue - Extension

54. A complete set of street improvement plans are to be submitted with the future N 82nd Avenue constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (60' ROW).

Proposed Wright Court, N 80th Avenue and N 81st Avenue

55. A complete set of street improvement plans are to be submitted with the future Wright Court, N 80th Avenue, and N 81st Avenue constructed in accordance with CDSM Street Detail ST2 - 2 Lane Local (52' ROW)

56. The site improvement plans are to be submitted with the minimum 25-foot curb radii on both sides of the road at the intersections of future N 82nd Avenue and Wright Court; Wright Court and N 81st Avenue; and the inside curb radii at the intersection of Wright Court and N 80th Avenue.

[Private Roads – Tract B Parking Stalls]

57. The site improvement plans are to be submitted with design information, depth and width, for the private parking stalls shown on Tract B at the southeast corner of the intersection of N 82nd Avenue and Wright Court. The stall depths, minimum 18-feet, are to be located behind the future right-of-way and the required 6-foot PUE. Additionally, the stalls should not exceed six (6) stalls, located as far to the south as possible, and away from the southeast curb ramp.

Utilities, Street Lighting, Street Trees, and Other Improvements:

[Street lighting]

58. All streetlight locations are to be shown on the utility plans and landscape plans.

59. Prior to submitting electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street Trees and Landscaping]:

60. The applicant is required to show proposed driveway locations for each lot to ensure that street trees are not impacted.

[Storm Facility Landscaping]:

61. The applicant is to submit revised stormwater facility plans that provide for a minimum 6-foot-high black vinyl coated chain link fence with top rail installed along the north, east, and west property lines of Tract A where the tract abuts the future Lot 25 and the access road to the storm facility. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the access road to the facility and a minimum 4-foot-wide man gate.

[Street lighting]

62. All street light locations are to be shown on the engineering and landscape plans. Any streetlights provided for private streets are required to be metered separately and are to be owned and maintained by the HOA / homeowners.

63. Prior to submittal of electrical plans to Clark Public Utilities, the preliminary electrical plans for streetlights, transformers, J-boxes, etc., which are prepared by others, are to be submitted to the city for review and approval.

[Street trees and Landscaping]:

64. The applicant is to show proposed driveway locations for each lot to ensure that street trees are not impacted.

[Storm Facility Landscaping]:

65. The applicant is to submit revised stormwater facility plans that provide for a minimum 6-foot-high black vinyl coated chain link fence with top rail installed along the north property lines of Tract D

where the tract abuts the future Lot 20. Additionally, the plans are to provide for a minimum 16-foot-wide double gate at the access road to the facility and a minimum 4-foot-wide man gate.

[Traffic Impact Analysis]

66. The corner sight-distance triangles / site vision clearance triangles, at the intersection of the future access road and NE 28th Street, are to be shown on the final engineering plans and landscaping plans.

Prior to Any Land-Disturbing Activities:

67. A copy of Ecology's NPDES GCSWP permit, a copy of the SWPPP, and the financial security for erosion and sediment control are to be submitted to the city.

68. prior to any land-disturbing activities, which includes tree cutting, clearing and grading, and an approved set of final engineering plans is required that includes the erosion prevention and sediment control measures is required.

Prior to Final Plat Approval:

Planning:

69. The applicant shall post a mitigation bond in an amount deemed acceptable by the city to ensure the oak mitigation is fully functional per CMC 16.51.250.

70. An avigation easement is required to be recorded on the title that provides notice that the property is located within an air traffic area per CMC 18.34.020.B and included as a note on the final plat.

Engineering:

71. Prior to final plat approval, a plat note addressing the proportionate share amount per Lot, payable to the city for the North Shore Sewer Transmission System (aka NUGA-STS) is warranted.

72. The applicant is required to provide an easement encompassing the T-29 public access trail and the future sanitary sewer pressure main.

[Water]

73. A minimum 30-foot-wide utility easement over and under said utility easement is to be shown on the final plat and conveyed to the city for inspections, maintenance, and repairs of said utilities located within the easement.

74. A note is to be added to the final plat stating that irrigation meters required for open space areas are to be privately owned and maintained by the Owners and/or Homeowners Association (HOA).

[Storm Drainage]

75. The following proposed notes are to be added to the final plat.

    a. Stormwater facilities located on Tract A are to be owned and maintained by the homeowner's association (HOA)/homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.
    b. Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tract A.

[Sanitary Sewer Disposal]

76. Prior to final plat approval, the following note are to be added to the final plat stating that the grinder pumps for Lots 1 through 34 are to be owned and maintained by the property owners.

77. A minimum 30-foot-wide utility easement over and under said utility easement is to be shown on the final plat and conveyed to the city for inspections, maintenance, and repairs of said utilities located within the easement.

[Roads]

78. Prior to final plat approval, the preliminary plat is to be revised with the final street names as determined by the Building Official.

79. The preliminary plat is to be revised and submitted with the minimum 25-foot curb radii on both sides of the road at the intersections of future N 82nd Avenue and Wright Court; Wright Court and N 81st Avenue; and the inside curb radii at the intersection of Wright Court and N 80th Avenue.

80. The preliminary plat is to be revised and submitted with the minimum 25-foot curb radii on both sides of the road at the intersections of future N 82nd Avenue and Wright Court; Wright Court and N 81st Avenue; and the inside curb radii at the intersection of Wright Court and N 80th Avenue.

81. The preliminary plat is to include a plat note stating that the private parking stalls on Tract B are to be owned and maintained by the Homeowners Association (HOA)/homeowners.

Prior to Final Acceptance:

Engineering:

[Traffic Impact Analysis]

82. The applicant is required to pay the proportionate share amount of $28,949.00 to the City of Vancouver. The applicant is to provide Camas staff with documentation of payment of said proportionate share amount.

Planning:

83. A conservation covenant should be recorded with the County to ensure the long-term preservation of the critical areas and any associated buffers, including maintenance of any mitigation actions, per CMC 16.51.240 and conditioned as such. Further, a copy of the recorded conservation covenant document must be submitted to the city prior to final acceptance

84. All landscaping to be installed or bonded for and all proposed street trees and landscaping are to be per the CDSM Landscape Standards Plant Materials list.

85. An avigation easement is to be recorded on the title that provides notice that the property is located within an air traffic area and a copy submitted to city staff for confirmation.

Prior to Final Occupancy:

Planning:

86. Street trees adjacent to lots should be installed prior to final occupancy per CMC 17.19.030.F.4.

Proposed Plat Notes

1. A homeowner's association (HOA) will be required for this development. Copies of the C.C. & Rs shall be submitted and on file with the City of Camas.

2. Building permits will not be issued by the Building Department until all subdivision improvements are completed and Final Acceptance has been issued by the City.
3. Maximum building lot coverage will be 55% for single-story homes and 50% for two-story homes.
4. The lots in this subdivision are subject to traffic impact fees, school impact fees, fire impact fees and park/open space impact fees. Each new dwelling will be subject to the payment of appropriate impact fees at the time of building permit issuance.
5. Tree topping is not permitted within this development, nor removal of more than 20 percent of a tree's canopy. Trees that are determined to be hazardous by a licensed arborist may be removed after approval by the City. Required street trees shall be promptly replaced with an approved species.
6. In the event any item of archaeological interest is uncovered during a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease, and the applicant shall notify the City and the Department of Archaeology and Historic Preservation (DAHP).
7. At the time of building permit issuance, each Lot is subject to a $1,235.77 fee per Lot, as the proportionate share contribution for the North Shore Sewer Transmission System, previously known and approved as the 'North Urban Growth Area – Sewer Transmission System' or NUGA-STS. If the NUGA SDC fees are updated to include the proportionate share fee amount of $1,235.77 per Lot, the proportionate share fee will no longer be required.
8. Irrigation meters required for open space areas are to be privately owned and maintained by the Owners and/or Homeowners Association (HOA).
9. Stormwater facilities located on Tract A are to be owned and maintained by the homeowner's association (HOA)/homeowners at the completion of the 2-year warranty period, which expires 2-years after issuance of final acceptance.
10. Right-of-entry shall be granted to the city for inspection purposes of the stormwater facilities located on Tract A.
11. The grinder pumps for Lots 1 through 34 are to be owned and maintained by the property owners.
12. Tract B contains a private parking area that is to be owned and maintained by the Homeowners Association (HOA)/homeowners.

PROJECT NARRATIVE
For

LANDING AT GREEN MOUNTAIN 2

A PRELIMINARY TYPE III SUBDIVISION

Submitted to the
CITY OF CAMAS

FOR
Pacific Lifestyle Homes
11815 NE 99th Street Suite 1200
Vancouver, WA 98682

July 2025

Table of Contents

General Information 2
Project Description 3
Title 16 – Environment 4
16.01 - SEPA 4
16.31 – Archaeological Resource Preservation 4
16.51 – Critical Areas - 16.53 Wetlands – 16.55 Critical Aquifer Recharge Areas - 16.61 Fish and Wildlife Habitat 4
Title 17 – Land Development 4
17.01.050 – Survey Content 4
17.11 – Subdivisions 4
17.11.030.D. - Criteria for Preliminary Plat Approval. 5
17.19.030 – Tract, block and lot standards 7
17.19.040 – Infrastructure Standards 7
Title 18 - Zoning 10
18.07 – Use Authorization 10
18.09 – Density and Dimensions 10
18.11 – Parking 12
18.13 – Landscaping 12
18.15 – Signs 13
18.17 – Supplemental Development Standards 13
18.34 – Airport Overlay Zoning 13
18.55 – Administration and Procedures 13

General Information

Applicant:	**Pacific Lifestyle Homes** 11815 NE 99th Street Suite 1200 Vancouver, WA 98682 (360) 597-7098 NickE@buildplh.com
Owner:	**Linda Middagh** 22015 NE 28th Street Camas, WA 98607 **Emmert Family III LLC** 10470 SE Hillcrest Dr. Happy Valley, OR 97086
Contact:	**PLS Engineering** **Contact: Jayson Taylor** 604 W Evergreen Blvd Vancouver, WA 98660 (360) 944-6519 pm@plsengineering.com
Location:	**SW 1/4 Section 21, T2N, R3E, WM**
Site Address:	**22015 & 22111 NE 28th St. Camas, WA**
Project Size:	**9.6 acres**
Jurisdiction:	**Camas**
Zoning:	**R-7.5**
Zoning Overlay:	**Airport Overlay**
Comprehensive Plan:	**SFM**
Current Use:	**Single family residence**
Tax Lot Information:	**611175000, 173177000, 173210000**
School District:	**Evergreen**
Elementary:	**Harmony**
Middle:	**Pacific**
High:	**Union**
Water District:	**Camas**
Sewer District:	**Camas**
Fire District:	**Camas**
Camas Project Reference:	**PA24-1035**

Project Description

The Landing at Green Mountain 2 proposes to subdivide 9.6 acres into 34 single-family detached residential lots in the R-7.5 zone utilizing density transfer standards. A concurrent Boundary Line Adjustment (BLA) is proposed to develop a modified parcel #17317700 that will contain 7.8 acres. Parcel 17321000 will be reduced to 1.9 acres. The intent is to record the BLA prior to final engineering approval.

The existing structures on parcel 17321000 will remain while all structures on parcel 173177000 will be removed.

The site is primarily field grass with landscaping and scattered trees. The site is bordered by NE 28th Street to the north, single-family residences to the east and west, and Camp Currie to the south.

Transportation and Utilities:
Primary access to the site is provided from N 82nd Avenue from the east. This project will extend N 82nd Avenue through the site and will include a temporary hammerhead turnaround until the parcel to the west develops.

NE 28th Street abuts the site to the north. Frontage improvements along this street will include additional right-of-way and pavement to meet the requirements for a 3-Lane Arterial. No vehicular access to NE 28th Street is proposed; a sidewalk connection will be made from the proposed cul-de-sac to NE 28th Street.

The internal public streets will be constructed according to standard detail number ST3. These streets will generally provide a 28'wide paved road within a 52' right-of-way with 5' sidewalks and 5' planter strips on each side. The E-W circulation roadway will be built to standard detail number ST2 and will include a 60' right-of-way.

A traffic study has been provided that shows the projected trip generations for the development. No offsite mitigation is required based on the study.

The City of Camas is the water and sewer purveyor for the site. Existing water and sewer lines run along NE 28th Street to the north. The applicant expects to utilize a grinder pump system for sanitary sewer service for a majority of the proposed lots.

All onsite stormwater runoff will be routed to a stormwater detention facility prior to being released into a wetland buffer to the south of the site. Stormwater from pollution generating surfaces will be treated prior to entering the detention facility.

Critical Areas:
There are three Oregon White Oak trees located onsite that are proposed to be retained. There is also a wetland buffer that extends onto the site that affects the SW corner of the site, see the included Critical Areas Report for more information.

Proposal & Code Compliance Discussion

Title 16 – Environment

16.01 - SEPA

The State Environmental Policy Act (SEPA) procedures require documentation of critical areas as well as discussion on earth, air, water, plants and animals, energy and natural resources, environmental health, noise, land and shoreline uses, aesthetics, recreation, historic and cultural preservation, transportation, and public services and utilities. A SEPA application is required and has been included with this application.

16.31 – Archaeological Resource Preservation

The site is located in an area of moderate to high and high probability for the presence of archaeological artifacts. The site is also within an Archaeological Site Buffer per Clark County GIS data. An Archaeological Predetermination Survey Report is required for this project. Archaeological Services, LLC (ASCC) performed an onsite field investigation on April 14, 2025. The report dated May 16, 2025 documents that no archaeological materials were found. A residence that dates to 1962 should Given the negative results of the predetermination, ASCC recommended that no further archaeological work is needed.

16.51 – Critical Areas - 16.53 Wetlands – 16.55 Critical Aquifer Recharge Areas - 16.61 Fish and Wildlife Habitat

There are three Oregon White Oak trees located onsite that are proposed to be retained. There is also a wetland buffer that extends onto the site that affects the SW corner of the site. The offsite wetland is estimated to be a Category II wetland. See the included Critical Areas Report for more information regarding critical areas. A tree protection plan has also been prepared which includes recommendations for the trees that are proposed to be retained including the Oregon White Oak trees.

Title 17 – Land Development

17.01.050 – Survey Content

17.01.050.B.2 addresses tracts shown on a preliminary plat. Two tracts are shown on the preliminary plat that will be privately owned and maintained by the future Homeowners Association. The following details the proposed tracts:

Tract:	Size	Use
A	36,532 sf	Park, Open Space, Storm Facility
B	9,775 sf	Open Space

17.11 – Subdivisions

This project is subject to a Type III process for land division. The application will be subject to the development approval and application timelines of this chapter.

The applicant has submitted the required documents and information as required by this section of code. A Submittal Requirements checklist was thoroughly reviewed with this application prior to submittal.

17.11.030.D. - Criteria for Preliminary Plat Approval.

The following addresses how the plat meets the criteria for approval:

1. *The proposed subdivision is in conformance with the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan, and any other city adopted plans;*

   By complying with the zoning and allowed uses as well as development code, this proposal will meet the goals and objectives of the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan and other city adopted plans.

2. *Provisions have been made for water, storm drainage, erosion control and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual;*

   All future lots will be served by public water and sanitary sewer. A storm drainage and erosion control plan, and utility plan are submitted with this application demonstrating how the plan meets current standards as adopted in the Camas Design Standards Manual. See section *17.19.040 – Infrastructure Standards* further below in this narrative, and the proposed plans, for further details.

3. *Provisions have been made for road, utilities, street lighting, street trees and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans;*

   The applicant is proposing frontage improvements to NE 28th Street and an extension of N 82nd Avenue through the site. New public internal streets will serve the site. The improvements meet the Camas Design Standard Manual. Please refer to the proposed plans and section *17.19.040 – Infrastructure Standards* further below in this narrative.

4. *Provisions have been made for dedications, easements and reservations;*

   Right-of-way will be dedicated for the roadway improvements and the appropriate easements will be recorded for each of the onsite utilities that are located outside of the roadway.

5. *The design, shape and orientation of the proposed lots are appropriate to the proposed use;*

   The lots proposed are appropriate for the proposed single family residential use.

6. *The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;*

   This narrative shows that the application complies with the applicable land development and zoning codes.

7. *Appropriate provisions are made to address all impacts identified by the transportation impact study;*

   A transportation impact study has been prepared for this project. This study indicates that all existing roadway infrastructure that will be used to serve the site will operate at acceptable levels of service at the time of full buildout. The applicant will be required to contribute $28,949 toward City of Vancouver projects for trip impacts to multiple intersections.

8. *Appropriate provisions for maintenance of commonly owned private facilities have been made;*

   The park areas and the stormwater facility are proposed to be owned and maintained by a homeowner's association.

9. *Appropriate provisions, in accordance with RCW 58.17.110, are made for:*

   a. *The public health, safety, and general welfare and for such open spaces, drainage ways, streets, or roads, alleys or other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds and all other relevant facts, including sidewalks and other planning features that assure safe conditions at schools bus shelter/stops, and for students who walk to and from school, and*

   Open space is provided with the project which is in addition to the ample open space located adjacent to the site. Drainage systems have been designed to meet city requirements. Public streets are proposed for the subdivision that will provide access to all proposed lots. All lots will be connected to public water and sewer services. A park area is provided within the development.

   It is not likely that potential students would walk to schools from this site. Harmony Elementary is 2.9 miles from the site. Pacific Middle School is 3.2 miles from the site. Union High School is 1.9 miles from the site.

   b. *The public use and interest will be served by the platting of such subdivision and dedication;*

The proposal provides much needed housing within an urban area that can be efficiently served with public facilities. The general public's interest will be served by this proposed development.

10. The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.

This narrative shows how the project complies with the applicable codes and environmental regulations. See the critical areas report for more information.

17.19.030 – Tract, block and lot standards

A. Critical areas will be clearly shown on the plat. Density transfer is proposed with this development.

B. Blocks have been provided and multiple roadway stub streets are provided to the east from this development. The park land to the south does not allow for road circulation to the south.

C. The use is compatible with existing uses therefore buffering is not required.

D. All lots front on a public street. Lot lines generally run at right angles to streets. There are no double frontage lots proposed. Building envelopes are shown on the Preliminary Plans.

E. There is a segment of the T-29 trail mapped at the southernmost end of the site. A wood chip path is proposed within Tract A that can be extended to the east or west.

F. Landscaping will be provided on each lot and within common areas as required by code. Please see section *18.13 – Landscaping* below as well as the Preliminary Landscape Plan which has been submitted with this application for reference.

G. A 6' public utility easement is proposed along the street frontage of all lots for electric lines and other public utilities not owned by the city.

H. There are no watercourses located on or near the site.

I. Street signs will be installed by the developer.

J. Street lighting is proposed for the development along the public street as required.

17.19.040 – Infrastructure Standards

NE 28th Street is an existing 3-lane arterial that abuts the site to the north. Half-width improvements are proposed as part of this project. A 37' half-width right-of-way will be

provided with a 23’ half-width paved roadway, 6’ detached sidewalks and a 6’ planter strip. No direct access to NE 28th Street is proposed other than a sidewalk connection.

N 82nd Avenue is a proposed 2-lane public road that meets the street standards for a Local Road Section B. A 60’ right-of-way, 36’ paved width, 5’ detached sidewalks with planter strips is proposed. This street is an extension that stubs into the site from the east. This development will extend the street through the site, stubbing it to the west for future development. A temporary hammerhead turnaround is proposed that can be removed once the parcel to the west develops.

All other proposed internal streets meet the standards for a Local Road Section A, providing a 52’ right-of-way, 28’ paved surface with 5’ sidewalks and planter strips on both sides. Wright Court street terminates in a cul-de-sac to the north. Streets are stubbed to the west for future development. A temporary hammerhead turnaround is proposed on the proposed dead end street stubs.

Streetlights will be installed per code requirements and will be shown at the time of Final Engineering.

Table 17.19.040-2 Minimum Public Street Standards			
Roadway Type	**ROW Width**	**Pavement Width**	**Sidewalk**
A. Street	52’	28'	5' detached both sides of the street with planter strip. No parking on one side.
B. 2-Lane Local Access Street	60’	36	Five foot detached sidewalks required on both sides of the street, with planter strip. Bike lanes required on collectors and arterials, no on-street parking.

No private streets are proposed.

Circulation:
The site is designed to meet the circulation standards of the city. The N-S block length between NE 28th Street and N 82nd Avenue is 515’. This is less than the maximum allowed block length of 600’. N 82nd Avenue is stubbed to the property to the west to allow for future developments to meet circulation standards and meet intersection spacing standards on NE 28th Street. The parcel to the south is not within the urban growth boundary and is also owned by Clark County. No vehicular circulation is shown extended to the south. A pedestrian easement will be provided on the south end of the site that will allow for a public trail.

Turnarounds:
Wright Court will terminate in a cul-de-sac that can be utilized as a fire turnaround. The dead-end length of the street as measured from the face of curb on NE 82nd Avenue is 495’. The

cul-de-sac has a 44' radius as measured to the back of sidewalk and complies with standard detail ST-36.

Intersection Design:
Intersections have been designed at right angles.

Pedestrian/Bicycle Circulation:
All sidewalks, driveway aprons, and road intersections will comply with the American with Disabilities Act.

Traffic Study:
A Traffic Study has been prepared for this project by Lancaster Mobley and is included with this application. The following is a summary of the study as found on page 4 of the report:

1. "The proposed Landing at Green Mountain Phase 2 project will include the construction of a residential subdivision at/near 22111 NE 28th Street in Camas, Washington. The proposal will include the construction of 34 single-family detached houses, removing/maintaining one existing single-family house for a net increase of 33 houses. Access to the site will be provided via a planned south leg at the intersection of N Hargrave Street at NE 28th Street.
2. The trip generation calculations show that the proposed subdivision is projected to generate an additional 23 AM peak hour trips, 31 PM peak hour trips, and 310 average weekday trips.
3. The proposed development is projected to impact nine of the transportation facilities where proportionate share fees are being collected by the City of Vancouver. The proposed development application will need to contribute a proportionate share fee of $31,099 toward these transportation improvement projects.
4. No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.
5. Traffic signal and all-way stop-control warrants are not projected to be met at any of the applicable study intersections under any analysis scenario through the 2027 site buildout year. Accordingly, no revisions to traffic controls are necessary or recommended as part of the proposed Landing at Green Mountain Phase 2 project.
6. The proposed development will reconstruct its associated street frontage with NE 28th Street to include pedestrian and bicycle facilities in accordance with City of Camas street standards. Additionally, appropriate pedestrian and bicycle facilities will be constructed within site internal streets to accommodate student pickup/drop-off via school bus. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Landing at Green Mountain Phase 2 subdivision, and no further mitigation to pedestrian and bicycle facilities are necessary and recommended.

7. All study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application.
8. The northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. However, this excess queue can be accommodated by the northeast bound through lane without extending back to any other public intersection or driveway along NE Goodwin Road. Limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur due to this queuing. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development."

Sewer and Water
The site will be served by the City of Camas for public sewer service. There is an 8" gravity main located in the north half of NE 28th Street. Due to the existing grade that slopes significantly away from NE 28th Street, all lots will be serve by a grinder pump system.

City of Camas will provide public water service. There in an existing 12" water main located in the south half of NE 28th Street. The development will extend a new 8" water main through the site from NE 28th Street to serve the new lots. Two new fire hydrants are proposed within the development.

Stormwater and Erosion Control
Stormwater runoff from pollution generating surfaces is proposed to be treated using filter cartridges and then routed to a detention pond on the south end of the site.

A preliminary stormwater plan has been submitted with this application. The preliminary technical information report (TIR) has also been submitted with this application which better explains the stormwater system and how it meets the applicable code.

Title 18 - Zoning

18.07 – Use Authorization

The site is designated as being within the R-7.5 zoning district, a single-family residential district. The applicant proposes to subdivide the site into 34 lots for the intended use of single-family detached dwellings. This use is permitted outright in the R-7.5 zone.

18.09 – Density and Dimensions

Lots in the R-7.5 zone are required to meet the requirements of Table 1 of CMC 18.09.040. The applicant proposes to utilize density transfer standards and is requesting smaller lot sizes and setbacks due to the open space dedication provided.

Table 1 – Density and Dimensions for Single-family Residential Zones			
	R-7.5	**Density Transfer**	**Proposed**
Maximum density (dwelling units/net acre)	5.8	5.8	3.62
Average lot area (square feet)	7,500	-	5,824**
Minimum lot size (square feet)	6,000	5,250	5,000*
Maximum lot size (square feet)	12,000	9,000	41,512***
Minimum lot width (feet)	70	60	50*
Minimum lot depth (feet)	90	80	100’
Maximum building lot coverage	40%	40%	50%, 55% for single level homes*
Maximum building height (feet)	35	35	35

* Additional flexibility requested per CMC 18.09.060.D
**Excluding 1.9 acre parent parcel
***One time exception for parent parcel

Table 2 – Building Setbacks for Single-family Residential Zones	
Minimum front yard	**20’***
Minimum side yard	5’
Minimum side yard flanking a street and corner lot rear yard	10’
Minimum rear yard	**25’***
Maximum lot frontage on a cul-de-sac or curve	30’

*Additional flexibility requested per CMC 18.09.060.D

The proposal qualifies to be reviewed under the density transfer standards due to the fact that the proposal includes critical areas and recreational area tracts within the land division. The main open space tract is 0.84 acres in size and includes recreational amenities including trails and picnic benches. The sites’ critical area including wetland buffers two Oregon White Oak trees are proposed to be retained within the open space tract.

The density transfer code section in the Camas Municipal Code 18.09.060.D states:

> *“Where a tract under "C" above, includes one-half acre or more of contiguous area, the city may provide additional or negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards under CMC Section 18.09.040 Table 1 and 2. In no case shall the maximum density of the overall site be exceeded. A letter explaining the request for negotiated flexibility shall be submitted to the director for consideration.”*

The proposed open space tract exceeds ½ acre of contiguous area, therefore the site qualifies for flexibility in regards to lot standards. Per Camas Municipal Code 18.09.060 the applicant is requesting flexibility in the following code requirements:

- Reduced average lot size of 5,824 sf
- Reduced minimum lot size of 5,000 sf
- Reduced minimum lot width of 50'
- Reduced minimum front or front porch setback of 15'
- Reduced minimum garage setback of 20'
- Reduced minimum rear setback of 15'
- Increased lot coverage of 55% for single-story homes and 50% for two-story homes

The proposed requests are reasonable, and the minimum required to attain the allowed density on this site while still providing a mix of marketable homes. The reductions stated above are proposed to replace the standards of Camas Municipal Code 18.09.040. In return for flexibility to lot standards the applicant will provide trails and picnic tables within the recreational open space. This area can be owned and maintained by a homeowner's association or by the city if desired. Pedestrian paths are proposed to be stubbed to the east and west to be extended with future development. Attractive landscaping will be provided in the park area, and it will support a range of recreational activities.

With the proposed open space and the standards of integration of various lot sizes within the community, we believe that the proposed subdivision meets the intent of the zoning code and would result in an overall benefit for the public and the future residents of the community. This proposal achieves the desired density for the area which will help meet housing goals for the City. Increased housing helps to provide affordable housing which is an on-going issue in the greater Clark County area.

18.11 – Parking

Single-family residential dwellings are required to provide 2 parking spaces per unit. Each home will have a 2-car garage plus driveway space for parking, meeting and exceeding the minimum requirement.

Per CMC 17.19.040.B.10.e one additional off-street parking space is required for every five units when the average lot size is less than 7400 sf. With 34 proposed lots 7 off-street parking spaces are required. 7 total off-street parking spaces are proposed. They are located on tract B. This tract will be owned and maintained by a homeowner's association. These parking spaces meet the standard space dimensions and have a width of 9' and a depth of at least 18'.

18.13 – Landscaping

A Landscape, Tree and Vegetation Plan has been submitted with this application showing proposed landscaping, and all onsite trees proposed to be retained or removed.

A 20-unit/acre tree density per net acre has been incorporated into the site plan. The tree density is met by providing street trees, and plantings withing the proposed tract areas. The proposed and adjacent uses are residential or open space, so specific landscape buffers are not required.

18.15 – Signs

No signs are proposed with this project at this time.

18.17 – Supplemental Development Standards

This application will need to comply with the standards found in this section. Some standards that will apply include:

- 18.17.030 - Corner lot vision clearance area: a 15'x15' vision clearance area is required on all corner lots.
- 18.17.040 - Accessory structures: No accessory structures are proposed with this application. If accessory structures are proposed by individual lot owners, they will need to comply with this section.
- 18.17.050 - Fences and walls: fences will be limited to 6'.
- 18.17.060 - Retaining walls: walls are generally limited to 6'.

18.34 – Airport Overlay Zoning

The site is located within one mile of the Grove Field Airport, within Zone C of the overlay. City of Camas code recommends, "Whenever a property owner within zone C applies for a building permit, it is recommended that the owner be informed of construction or remodeling techniques that would decrease the noise associated with the airport operation and heavy air traffic areas." No uses are prohibited in this zone.

18.55 – Administration and Procedures

This project is subject to a Type III process for land division. The application will be subject to the development approval and application timelines of this chapter.

A preapplication meeting is required per CMC 18.55.060. A preapplication conference was held on January 23, 2025 and a land use application was submitted within 180 days.

The applicant has submitted the required documents and information as required CMC 18.55.110.

PRE-APPLICATION MEETING NOTES
The Landing at Green Mountain 2 subdivision
PA24-1018

Thursday, October 3, 2024
3:30pm, City Hall (meeting via zoom)
616 NE 4th Ave. Camas, WA. 98607

Applicant:	PLS Engineering Jason Taylor
City of Camas:	Lauren Hollenbeck, Senior Planner Anita Ashton, Engineering Project Manager Ahmed Yanka, Engineer II Brian Smith, Building Official Randy Miller, Deputy Fire Marhsal
Location:	22111 NE 28th Street Camas, WA 98607 Parcel Number: 611175000
Zoning:	R-7.5 (Single-Family Residential)
Description:	To subdivide 4.83-acres into 18 single-family detached residential lots.

NOTICE: Notwithstanding any representation by City staff at a pre-application conference, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite to an applicant all relevant applicable code requirements shall not constitute a waiver by the City of any standard or requirement. [CMC 18.55.060 (C)] This pre-application conference shall be valid for a period of 180 days from the date it is held. If no application is filed within 180 days of the conference or meeting, the applicant must schedule and attend another conference before the City will accept a permit application. [CMC 18.55.060 (D)] Any changes to the code or other applicable laws, which take effect between the pre-application conference and submittal of an application, shall be applicable. [CMC 18.55.060 (D)]. A link to the Camas Municipal Code (CMC) can be found on the City of Camas website, http://www.cityofcamas.us on the main page under "City Codes".

PLANNING DIVISION **LAUREN HOLLENBECK (360) 817-7253**

An application for a subdivision is considered a Type III permit. Applicable codes for this proposal include Title 16 Environment, Title 17 Land Development and Title 18 Zoning of the Camas Municipal Code (CMC), which can be found on the city website. Please note it remains the **applicant's responsibility** to review the CMC and address all applicable provisions. The following pre-application notes are based on application materials and site plan submitted to the City on September 17, 2024:

PLEASE NOTE: Land use applications are now required to be submitted and paid on-line at www.cityofcamas.us/com-dev. When you apply online, be sure to select SUBDIVISION as the main application plan type. If you are unsure, contact the Planning Department for assistance.

Application Requirements

Your proposal will need to comply with the general application requirements per **CMC Section 18.55.110** in addition to the specific applicable application requirements outlined in **CMC Section 17.11.030.B** for a preliminary subdivision plat. The following is an excerpt from the requirements of CMC Section17.11.030.B (see code section for full text):

1. A completed city application form and required fee(s), which are addressed at on-line submittal;

Fees will be based on the adopted fees at the time of land use application submittal. The current fees include the following:	
1. Preliminary Plat	$8,204.00 + 261.00 per lot
2. SEPA	$926.00
3. Critical Areas Review *(wetlands)*	$886.00
4. Critical Areas Review (*habitat conservation area)*	$886.00
5. Archaeological Review	$157.00
6. Fire Department Review	$402.00
Fees for building permit are collected at the time of the building permit submittal. Fees for engineering are collected at time of engineering plan approval.	
7. Building Permit and Plan Review	based on the valuation of the project
8. Engineering Review	3% of estimated construction costs

2. A completed and signed SEPA checklist;
3. Complete applications for other required land use proposals applicable to the proposal;
4. A vicinity map showing location of the site;
5. A survey of existing significant trees as required under CMC Section 18.13.045;
6. All existing conditions shall be delineated on the site plan per CMC Section 17.11.030.B.6(a-p);
7. A preliminary grading plan as slopes are greater than ten percent;
8. Preliminary stormwater plan and report;
9. A geotechnical report consistent with CMC Chapter 16.59 if development is proposed on slopes greater than ten percent
10. A copy of the Clark County assessor's map which show the location of each property within 300 feet of the subdivision;
11. A current (within thirty days prior to application) mailing list and mailing labels of owners of real property within three hundred feet of the subject parcel, certified as based on the records of the Clark County assessor;
12. A traffic study
13. A narrative addressing ownership and maintenance of open spaces, stormwater facilities, public trails and critical areas, and the applicable approval criteria (CMC Section 17.11.030.D) and standards of the Camas Municipal Code. It should also address any proposed building conditions or restrictions.
14. A development sign must be posted on site per CMC Section 18.55.110.H (1-5).
15. Necessary drawings and reports- three full size paper copies of the site plan drawings. All other documents and reports shall be provided with the on-line application submittal.

Preliminary Plat

The following comments are based on the site plan materials submitted with this Pre Application:

1. The preliminary plat drawings must meet the density and dimensional standards for lots in a Single-Family Residential (R-7.5) zone, and infrastructure improvements (i.e. roads, easements, etc.).
2. Density calculation is based on development/net acreage which is defined as the total land use development exclusive of open space and critical areas.
3. Density transfer provisions of CMC 18.09.040.B Table-1 may be utilized if a land division sets aside of tract for the protection of a critical area, natural open space network, or network connector, or approved as a recreational area.
    a. Further, the city may provide additional or negotiated flexibility to the lot size, lot width, lot depth, building setback, or lot coverage standards under CMC Section 18.09.040 Table 1 and 2. In no case shall the maximum density of the overall site be exceeded. A letter explaining the request for negotiated flexibility shall be submitted to the director for consideration per CMC 18.09.060.D.
4. Building setback requirements are found at CMC 18.09.040-Table 2, which includes the requirement for setbacks to be drawn on the plat. Per Note 2, *"Garage setback is five feet behind the front of the dwelling."*
5. The western side lot line of lot 4 shall be radial to curved streets per CMC 17.19.030.D.2.
6. Building envelopes (setbacks) shall be shown on the preliminary and final plats. Per CMC Section 17.19.030.D.3.a, a 40ft. by 40ft. square dwelling should be able to fit within the building envelope.
7. Per CMC 17.19.030.D.6, Lots 1-3 shall comply with the provisions for double frontage lots.
8. Each dwelling unit within a new development shall be landscaped with at least one tree per CMC 17.19.030.F.
9. Per CMC 17.19.040.B.1.c, if the average lot size is less than 7,500 square feet, one additional off-street parking space is required for every 5 units and shall be located within a common tract.
10. Per CMC 17.19.040.B.10.a, a Circulation plan is required at application that includes the subject site and properties within six hundred feet showing topography, critical areas and existing and proposed streets, trails, etc.
11. The storm drainage facility shall include a 10-foot L2 landscape buffer per CMC 17.19.030.F.6.
12. The location and height of any retaining walls shall be shown on the grading plan. Retaining wall height requirements are found in CMC 18.17.060.
13. The property is located within the Airport Overlay Zone C and the applicable provisions in Chapter 18.34 shall apply.

Landscaping Regulations and Tree Retention

Landscaping standards shall apply to all new land divisions per CMC 18.13.020.B.1. A Landscape, Tree and Vegetation plan must be submitted pursuant to CMC 18.13.040.A. If trees are proposed for removal, a Tree Survey is required per CMC 18.13.040.B and must be prepared by a certified arborist or professional forester pursuant to the requirements outlined in CMC 18.13.045. A minimum 20-unit tree density per net acre is required and needs to be incorporated in the overall landscape plan per CMC 18.13.051.A.

Parking Regulations
The proposed use will need to meet the automobile parking requirements pursuant to CMC Chapter 18.11. The number of off-street parking spaces is calculated based on the table at CMC 18.11.130 Standards.

Critical Areas Review
Clark County GIS mapping identifies wetlands and fish & wildlife habitat conservation areas (i.e. oak habitat) on and adjacent to the subject property. As such, per CMC Section 16.51.130, a critical areas report prepared by a qualified professional is required if a proposed development is within or adjacent to a critical area. The general requirements for a critical areas report are found in CMC Section 16.51.140. The City's code contains additional requirements for each type of critical area.

- The critical areas report requirements for *Wetlands* are found in CMC 16.53.030.
- If Oregon White Oaks greater than 20" dbh, which are considered a habitat of local importance, are surveyed on site, a critical areas report is required per CMC 16.61.020 *Fish and Wildlife Habitat Conservation areas*.

SEPA
The proposed development is not categorically exempt from the requirements of the State Environmental Policy Act (SEPA) per CMC Section 16.07.020.A as the proposed is more than ten residential units and contains environmentally sensitive areas per CMC 16.07.025.C. The current SEPA environmental checklist is on the website.

Archaeological Review
The site is located in an area of high probability for the presence of archaeological objects. As such, an archaeological predetermination report is required consistent with the requirements of CMC 16.31.070.A. Submit proof of mailing or emailing the tribes per CMC 16.31.160.

ENGINEERING DIVISION — **ANITA ASHTON (360) 817-7231 aashton@cityofcamas.us**
AHMED YANKA (360) 817-7258 ayanka@cityofcamas.us

General Requirements:

1. Final engineering site improvement plans shall be prepared in accordance with the Camas Design Standards Manual (CDSM) and CMC 17.19.040, by a licensed Civil Engineer in Washington State.
2. ***Civil construction plans are not to be submitted until after Planning issues the land-use decision.***
3. ***After the land-use decision is issued, the applicant is to submit the Civil construction plans via the online portal at www.cityofcamas.us/Permits under the 'Civil Construction Application'.***
4. CDev Engineering Dept. is responsible for plan review (PR) and construction inspection (CI) of the civil site improvements.
5. A 3% PR&CI fee is collected by engineering for all infrastructure improvements.
    a. A stamped preliminary engineer's estimate shall be submitted to the CDEV Engineering Dept. with submittal of plans for first review.
    b. Payment of the 1% plan review (PR) fee shall be due prior to the start of the first review.
    c. Payment of the 2% construction inspection (CI) fee shall be due prior to construction plan approval and release of approved plans to the applicant's consultant.
    d. Under no circumstances will the applicant be allowed to begin construction prior to engineering plan approval.

6. *Per CMC 17.21.060.H Except for one sales office or one model home, building applications will not be accepted until after Final Acceptance has been issued for all infrastructure improvements.*
7. *Final acceptance is issued by the Community Development Engineering Dept.*
8. Existing wells and septic tanks and septic drain fields shall be decommissioned in accordance with State and County guidelines per CMC 17.19.020 (A3).
9. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, and traffic control markings for the proposed development.
10. Work within the city right-of-way (ROW) will require submittal an encroachment permit and approval of a traffic control plan (TCP), prior to the start of any work.
11. Regulations for installation of public improvements, improvement agreements, bonding, final platting, and final acceptance can be found at CMC 17.21.
12. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, interior street/parking lighting, and associated appurtenances are installed.

Traffic/Transportation:

1. A transportation impact analysis (TIA) is required when a proposed development results in 199 vehicle trips per day (VPD) or more.
2. As proposed, the development will generate 180 ADTs, therefore a TIA may be required.
3. The Applicant will be required to have a traffic engineer analyze the following:
    a. Site distance access at applicants proposed access intersections.
    b. Vision clearance areas are to be addressed, per CMC 18.17.030.
    c. A traffic circulation plan showing on-site ingress and egress, per CMC 17.19.040 (B.10.a).
    d. Address movement conflicts with existing nearby intersections; and
    e. Provide trip AM and PM Peak distribution to and from the site.
3. The City of Vancouver requires trip distributions to the following intersections for payment of proportionate share contributions:

Proportionate Share Project Name	Fee Rate	Number of Trips	Proportionate Share Cost
137th Ave – from NE 49th St to Fourth Plain Blvd	$3,000 per PM peak hour trip		
Fourth Plain Blvd & NE 152nd Ave	$333 per PM peak hour trip		
Leiser / St. Helens / MacArthur	$2,000 per PM peak hour trip		
SE 176th Ave & SE 20th St	$400 per PM peak hour trip		
NE 192nd Ave & NE 13th St	$400 per PM peak hour trip		
SE 192nd Ave & SE 34th St	$150 per PM peak hour trip		
192nd Ave & SR-14 ramp terminals	$2,000 per PM peak hour trip		
MacArthur Blvd & Andresen Rd Roundabout	$2,285 per PM peak hour trip		
MacArthur Blvd & Devine Rd Roundabout	$2,226 per PM peak hour trip		
Grove St / Columbia House Blvd / SR-14 WB off-ramp	$600 per **AM** peak hour trip		
NE 172nd Ave & NE 18th St	$300 per PM peak hour trip		
NE 179th Place & NE 18th St	$900 per PM peak hour trip		
NE 187th Ave & NE 18th St	$1,200 per PM peak hour trip		
NE 162nd Ave & NE 9th St	$1,500 per PM peak hour trip		
NE 172nd Ave & NE 9th St	$4,100 per PM peak hour trip		
NE 192nd Ave & NE 9th St	$1,100 per PM peak hour trip		
NE 187th Ave & SE 1st St	$ 1,100 per PM peak hour trip		
Total Proportionate Share Cost			**$XXXX**

Streets:

1. The proposed development is located along the south side of NE 28th Street.
2. NE 28th Street is classified as an existing 3-lane arterial per the City's 2016 Transportation Comp Plan.
3. Per CMC 17.19.040.B.1, the applicant will be required to construct full depth half-width street improvements from the existing centerline on NE 28th Street along the frontage of the proposed development on NE 28th Street.
4. Per CMC 17.19.040.B.5, the applicant will be required to dedicate sufficient right-of-way from the existing centerline for full half-width, full-depth street improvements along the proposed frontage on NE 28th Street.
    a. The existing right-of-way (ROW) width along the frontage of the proposed development is 67-feet wide.

b. The applicant will be required to dedicate sufficient ROW to provide for a 37-foot-wide ROW width from the existing centerline of NE 28th Street.

c. Current ROW width from centerline is 30-feet.

5. Per CMC 17.19.040.B Street, public roads shall meet the requirements as shown on Table 17.19.040-2 'Minimum Public Street Standards'.
    a. The applicant has proposed to construct the extension of NE 26th Street renamed as NE 82nd Avenue from Phase 1 to access the future Phase 2 development site as follows: 60-foot-wide right-of-way, 36-foot paved surface, 5-foot-wide detached sidewalks, and planter strips on both sides.
    b. As proposed, extension of NE 82nd Avenue meets the street standards for Local Road Section B.
6. The applicant has proposed a public road improvement along the western property line that would be a half-width public road that would be widened to the full width public road standard at such time that the abutting property to the west develops.
    a. Proposed N Emmert Circle is shown as: 40-foot-wide right-of-way, 24-foot paved surface, 5-foot-wide detached sidewalk, and 7-foot planter strip with a dead-end cul-de-sac at both ends of the road.
7. Per CDSM, Table 3 – Access Spacing Standards:
    a. There is not a minimum intersection setback on a roadway classified as a local road. The intersection setback is approximately 310-feet, as measured from the centerline of N Hargrave to the centerline of proposed N Emmert Circle.
8. Per CMC 17.19.040.B.10.b.ii Cul-de-sacs and permanent dead-end streets over three hundred feet in length may be denied unless topographic or other physical constraints prohibit achieving this standard.
    a. When cul-de-sacs or dead-end streets are permitted, a direct pedestrian or bicycle connection shall be provided to the nearest available street or pedestrian oriented use.
    b. The proposed north cul-de-sac is approximately 372-feet in length as measured from the center of proposed NE 26th Street (N 82nd Avenue).
        i. The applicant will be required to construct a public pedestrian trail access from the end of the north cul-de-sac of Phase 2 to NE 28th Street.
        ii. The public pedestrian path is to be located within a Tract.
        iii. The Tract width is to be a minimum 10-foot-wide tract. Additional tract width will be based on other utilities, e.g. water and/or sewer mains located within the same tract.
    c. The proposed south cul-de-sac is approximately 579-feet in length as measured from the center of proposed NE 26th Street (N 82nd Avenue).
        i. The applicant will be required to construct a public pedestrian trail access from the end of the south cul-de-sac to the southernmost property line.
        ii. The public pedestrian path is to be located within a Tract.
        iii. The Tract width is to be a minimum 10-foot-wide tract. Additional tract width will be based on other utilities, e.g. sewer main located within the same tract.
    d. Per the 2022 Comprehensive Plan, the applicant will be required to construct that portion of the future T-29 trail across the southernmost property line.
        i. The future T-29 trail is to be placed with a Tract.
9. Street tree planting is required is accordance with CMC 17.91030 (F).

10. LED street lighting is to be installed along all street frontages within and adjacent to the proposed development, in accordance with CDSM.

Stormwater:

1. The site of the proposed development is approximately 4.83 acres in size.
2. The applicant shall submit a preliminary stormwater report (PTIR) in accordance with CMC 14.02 Stormwater Control and the most current edition of Ecology's *Stormwater Management Manual for Western Washington* ***(latest edition 2024 SWMMWW*)**.
3. The Department of Ecology (DOE) issued the latest edition of the *Stormwater Management Manual for Western Washington* on August 1, 2024.
4. Stormwater treatment and detention shall be designed in accordance with the latest edition of Ecology's ***Stormwater Management Manual for Western Washington (2024 SWMMWW).***
5. Refer to Ecology's *Figure I-3.2 Flow Chart for Determining Requirements for Re-Development (Vol. I, Chapter 3, Page 90)*.
    a. As the project will result in 5,000 sf, or greater, of new plus replaced hard surface area; then all Minimum Requirements will apply.
6. Per CMC 17.19.040.C.3.a Stormwater facilities are to be placed in a Tract, with right-of-entry to the City for inspection purposes.
7. Per CMC 14.02.090 ownership and maintenance of onsite stormwater facilities will be the responsibility of the Owner/HOA, per CMC 17.19.040 (C3).
8. Public and private storm easements, if required, are to be shown on the final engineering plans.
9. Provisions are to be provided for roof downspout controls. Stormwater from downspouts is not to be directed onto adjoining parcels. Reference CMC 14.02 and 17.19.040.C for roof downspout controls.

Erosion Control

1. The site of the proposed development is approximately 4.83 acres in size.
2. Per CMC 17.21.030.B an erosion and sediment control (ESC) bond, in the amount 200% of the engineer's estimate for ESC measures, is to be submitted prior to any land-disturbing activities.
3. As the land-disturbing activities are greater than one acre, the applicant will be required to obtain an *NPDES Construction Stormwater General Permit* from Ecology, which includes the *Stormwater Pollution Prevention Plan (SWPPP)*. Copies of both are to be submitted to Engineering prior to any land-disturbing activities.
4. The applicant will be responsible for all erosion and sediment control measures to ensure that sediment laden water does not leave the site or impact adjacent parcels.
5. Mud tracking onto the road surface is discouraged and any mud tracking is to be cleaned up immediately.

Water:

1. There is an existing 24-inch ductile iron water main located in the south half of NE 28th Street.
2. Per CMC 17.19.040.C.4 Each lot within a proposed development shall be served by a water distribution system designed and installed in accordance with city design standards.
3. The applicant will be required to design and construct a minimum 8-inch ductile iron water main from NE 28th Street to serve the proposed Phase 2 development.

4. The applicant will be required to provide a looped system from NE 28th Street, thru Phase 2 to Phase 1 via proposed Emmert Circle. This portion of the water main is to be located within a minimum 15-foot-wide tract.
5. The applicant shall provide a minimum 1-inch water service, and water meter box to each of the single-family residential lots located within this development.
6. Landscaping in open space tracts must have a separate irrigation service, backflow prevention device, meter box, and irrigation meter.
    a. The owner of the tract is responsible for payment for all fees associated with the installation of the meter and the water usage.
    b. Irrigation meters are to be owned by the HOA.
7. There is an existing fire hydrant on the north side of NE 28th Street, near the intersection of the proposed development.
    a. The applicant will be required to provide new fire hydrants located within the new development, per FMO.
8. Trenching, backfill, and surface restoration on NE 28th Street will be required, per CDSM Detail G2 and G2A.
9. Applicant shall demonstrate that there are adequate fire flows available for the development.
10. The tap on the existing water main is to be performed by a tapping Contractor approved by the City's Water/Sewer Dept. Approved list of Contractor's provided below.
11. A 10-foot separation shall be maintained between water and sanitary sewer lines.

<u>Sanitary Sewer:</u>

1. There is an existing 8-inch gravity main on the north side of NE 28th Street.
2. The applicant will be required analyze the existing 8-inch gravity main in 28th Street as well as the Goodwin Road Pump Station to ensure that both systems can handle the additional inflow from proposed development.
3. Per CMC 17.19.040.C.2 The applicant will be required design and construct a sanitary sewer system to serve the proposed development.
    a. The applicant shall provide a separate sanitary lateral for each single-family residential lots located within the development.
    b. The sanitary main is to be extended to a cleanout at the southernmost property line to tie into the future west-to-east force main.
    c. An access and maintenance easement to the city will be required.
4. The applicant will also be required to analyze existing 3-inch force main in Phase 1 of Landing at Green Mountain to make sure it sized properly to handle inflow from proposed phase 2 site.
    a. Applicant question regarding providing a sanitary sewer main separate from Phase 1and tapped at the sanitary main in NE 28th Street would be supported; however, the applicant would still be required analyze the existing 8-inch gravity main in 28th Street as well as the Goodwin Road Pump Station to ensure that both systems can handle the additional inflow from proposed development.
    b. A connect to NE 28th Street would require that the sanitary sewer main be located within a tract.
    c. The tract width would increase to 20-feet-wide with two utilities, e.g. water and sewer.
5. Due to the site sloping away from NE 28th Street, the proposed lots 4-18 will require individual grinders pumps for each SFR that will be owned and maintained by the individual homeowners.

6. Individual gravity sewer laterals to proposed Lots 1-3 from NE 28th Street would be supported.
7. Trenching and surface restoration on NE 28th Street is to be per CDSM Details G2 and G2A.
8. A 10-foot separation is required, within the right-of-way and the private road serving the development, between the water service and sewer lateral.

City Approved Tapping Contractors:

1. A&A Drilling Services, Inc (water & pressure sewer):
   16734 SE Kens Ct. #B, Milwaukie, OR 97267, 800-548-3827,
   http://www.aadrilling.com
2. Ferguson Waterworks (water only):
   14103 NW 3rd Court, Vancouver, WA 98685, 360-896-8708,
   https://www.ferguson.com/branch/nw-3rd-ct-vancouver-wa-waterworks

Garbage and Recycling:

1. Garbage and recycling receptacles are to be placed at the city right-of-way for pickup.

Parks/Trails:

1. Per the 2022 Parks, Recreation, and Open Space (PROS) Comprehensive plan, there is a segment of the T-29 trail, shown to traverse west-to-east, at the southernmost limits of the proposed development.
   a. Applicant will be required to provide an easement that can encompass both the pedestrian access trail and the sewer easement.
2. The property to the south and east of the proposed development is owned by Clark County Parks.

Impact Fees & System Development Charges (SDCs):

1. This development is in the North District.
2. Impact fees and SDCs are collected at time of building permit issuance.
3. The impact fees and SDCs noted below are for informational purposes only.
4. **Impact fees and SDCs are adjusted on January 1st of each year.**

Impact Fees for 2024 (North District):

Single Family:

1. Traffic Impact Fees (TIF) - $10,372.00
2. School Impact Fees (SIF) – $6,650.00
3. Park/Open Space (PIF) – $5,853.00
4. Fire (FIF) - $0.69 psf

System Development Charges (SDCs) – 2024 Charges:

1. Water –
   a. 3/4” meter - $9,056.00 + $450.00 connection fee
   b. 1” meter - $15,093.00 + $502.00 connection fee
2. Sewer – Residential
   a. Residential - $7,184.00

BUILDING DIVISION **BRIAN SMITH (360) 817-7243**

1. Any existing structures being removed need an asbestos survey and demolition permit.
2. Decommissioning of septic tanks and drain fields through Clark County Department of Health
3. The structures will be reviewed under the most current building codes as adopted by The State of Washington.
4. Geotechnical engineer's report may be required.
5. The required fire suppression systems shall be in accordance with IBC and other applicable codes standards and shall be reviewed by the Camas Fire Marshal's office.
6. Addresses will be assigned by the Building Division.
7. NE 26th Street as shown on the proposed pre-app plan that was submitted will need to be changed to N 82nd Ave to align with our city addressing grid.
8. Emmert Cir as shown on the proposed pre-app plan that was submitted will need to be changed to a street name that begins with an "M" to align with our city addressing grid.
9. Storm sewer disposal and connections shall be identified on the approved plans.
10. Storm water from adjacent properties and existing developments should be taken into consideration.
11. System Development Charges and Impact fees shall be assessed prior to building permit issuance.

FIRE DEPARTMENT **RANDY MILLER (360) 834-6191**

1. Any existing structures scheduled for demolition may be considered for use as a fire department training burn. Contact DFM Randy Miller at the FMO for further information. 360-834-6191
2. NFPA 13D Residential Fire Sprinklers required in all new dwellings. Additionally, it is recommended or may be required to mitigate access or turnaround issues, to install fire sprinklers in the garages. Contact the FMO for further information.
3. If a larger water meter is required to meet fire flow and the larger meter is not required for reasons of the international residential code/building department, the SDC up-charges are waived and the minimal cost difference in the actual meter shall be paid.
4. A flow switch is optional but recommended to tie into the homes security system along with an outside notification bell.
5. If a PRV is needed for pressures over 80 PSI on the domestic supply, it shall be installed after the fire line supply. If the pressure is over 80 PSI a PRV may be needed on the toilet supply line supplied from the fire sprinkler system.
6. An inside bell or horn strobe is recommended (If system is not tied into a security system) Contact Randy Miller in the FMO for more information.
7. Water supply line from the meter into the structure shall be sized per the fire sprinkler contractors design calculations or a 2- inch line shall be installed.
8. A fire hydrant is required at the corner of lot 9 at 86th and Emmert or the corner of 86th and Emmert and the Sport Court Tract
9. Witnessed hydrant flushing required with the FMO on any new fire hydrant installation.
10. Access roads or flag lots to be a minimum 12-foot wide paved with a 20-foot wide clearance and a minimum 13.6-foot vertical clearance. These minimums may be greater per city of Camas engineering department.

11. Approved Fire Department turnaround required for dead end streets or access driveway over 150 ft to residential structures measured from the center line of where the access road leaves the public street.
12. Provide approved radiuses for Cul-de-sacs and approved access curb radiuses to roads/driveways .
13. Obstructed access plan required for all private roads, flag lots serving more than one home or access tracts. Towing signs are the recommended plan unless an alternate method is provided and approved.
14. Any discovered underground oil or fuel storage tank requires a decommissioning permit through the Fire Marshal Office.
15. A propane Permit is required with the Fire Marshals Office for any tank installation over 124 gallons.
16. Approved address monuments required for any flag lots, driveways etc. where it leaves the main street. Contact the FMO for approval.
17. Temporary Addresses required at all times for each structure/lot until permanent address numbers are installed, please give attention to making the numbers extremely visible from the street and unlikely to be blocked by parked vehicles so emergency services can easily see and read.
18. Permanent address numbers required for all buildings. Please provide illumination for address numbers on the house.
19. The City of Camas has gone digital! Apply for permits online through our new Civic Access Portal at www.cityofcamas.us/permits.

Please do not hesitate to contact the FMO if you have any questions. 360-834-6191 or FMO@cityofcamas.us

We look forward to a safe and successful project.

Randy Miller
Fire Marshals Office
Camas - Washougal Fire Dept.

lancaster mobley

Landing at Green Mountain Phase 2

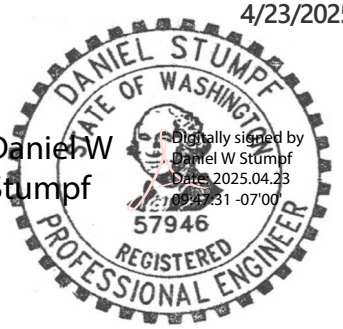
Transportation Impact Study
Camas, Washington

Date:
April 23, 2025

Prepared for:
Nick Edwards
Pacific Lifestyle Homes

Prepared by:
Daniel Stumpf, PE

4/23/2025



Daniel W Stumpf

Digitally signed by Daniel W Stumpf
Date: 2025.04.23 09:47:31 -07'00'

Table of Contents

Executive Summary 3

Project Description 4
- Introduction 4
- Location Description 4

Site Trips 8
- Trip Generation 8
- Trip Distribution 8
- Proportionate Share Contributions 9

Traffic Volumes 12
- Existing Conditions 12
- Background Conditions 12
- Buildout Conditions 13

Safety Analysis 17
- Crash History Review 17
- Warrant Analysis 18
- Pedestrian and Bicycle Safety 20

Operational Analysis 21
- Intersection Capacity Analysis 21
- Intersection Queuing Analysis 23

Conclusions 26

List of Appendices

Appendix A – Site Plan
Appendix B – Trip Generation and Distribution
Appendix C – Traffic Volumes
Appendix D – Safety Analysis
Appendix E – Operation Analysis

List of Figures

Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth) 5
Figure 2: Vicinity Map 7
Figure 3: Trip Distribution and Assignment 11
Figure 4: Year 2025 Existing Conditions 14
Figure 5: Year 2027 Background Conditions 15
Figure 6: Year 2027 Buildout Conditions 16

List of Tables

Table 1: Vicinity Roadway Descriptions 5
Table 2: Study Intersection Descriptions 6
Table 3: Site Trip Generation Summary 8
Table 4: Proportionate Share Contributions 10
Table 5: Crash Type Summary 17
Table 6: Crash Severity and Rate Summary 18
Table 7: Capacity Analysis Summary 22
Table 8: Queuing Analysis Summary 23

Executive Summary

1. The proposed Landing at Green Mountain Phase 2 project will include the construction of a residential subdivision at/near 22111 NE 28th Street in Camas, Washington. The proposal will include the construction of 32 single-family detached houses, removing one existing single-family house for a net increase of 31 houses. Access to the site will be provided via a planned south leg at the intersection of N Hargrave Street at NE 28th Street.
2. The trip generation calculations show that the proposed subdivision is projected to generate an additional 21 AM peak hour trips, 29 PM peak hour trips, and 292 average weekday trips.
3. The proposed development is projected to impact nine of the transportation facilities where proportionate share fees are being collected by the City of Vancouver. The proposed development application will need to contribute a proportionate share fee of $28,949 toward these transportation improvement projects.
4. No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.
5. Traffic signal and all-way stop-control warrants are not projected to be met at any of the applicable study intersections under any analysis scenario through the 2027 site buildout year. Accordingly, no revisions to traffic controls are necessary or recommended as part of the proposed Landing at Green Mountain Phase 2 project.
6. The proposed development will reconstruct its associated street frontage with NE 28th Street to include pedestrian and bicycle facilities in accordance with City of Camas street standards. Additionally, appropriate pedestrian and bicycle facilities will be constructed within site internal streets to accommodate student pickup/drop-off via school bus. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Landing at Green Mountain Phase 2 subdivision, and no further mitigation to pedestrian and bicycle facilities are necessary and recommended.
7. All study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application.
8. The northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. However, this excess queue can be accommodated by the northeast bound through lane without extending back to any other public intersection or driveway along NE Goodwin Road. Limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur due to this queuing. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development.

Project Description

Introduction

The proposed Landing at Green Mountain Phase 2 project will include the construction of a residential subdivision at/near 22111 NE 28th Street in Camas, Washington. The proposal will include the construction of 32 single-family detached houses, removing one existing single-family house for a net increase of 31 houses. Access to the site will be provided via a planned south leg at the intersection of N Hargrave Street at NE 28th Street.

Based on correspondence with City of Camas staff, the report conducts safety and capacity/level of service analyses at the following intersections:

1. NE Ingle Road at NE Goodwin Road (City of Camas)
2. N Hargrave Street at NE 28th Street (City of Camas)
3. NE 232nd Avenue at NE 28th Street (Clark County)
4. NE 242nd Avenue (SR-500) at NE 28th Street (WSDOT)

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses, and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The project site is located south of NE 28th Street, east of NE Ingle Road, and west of NE 232nd Avenue in Camas, Washington. The site consists of assessor parcels 173210000 and 173177000/611175000 and encompasses an approximate total of 10.6 acres. Located within a developing area of the City of Camas, the site is immediately surrounded by single-family house subdivisions to the north, a currently under construction residential subdivision to the east, low-density residential uses to the west, and undeveloped/forested land to the south.

Figure 1 presents an aerial image of the nearby vicinity with the project site outlined in yellow.



Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)

Vicinity Streets

The study area is composed of six roadways near the site. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Street Name	Jurisdiction	Functional Classification	Speed (MPH)	On-Street Parking	Curbs & Sidewalks	Bicycle Lanes
NE Ingle Road	Camas	Collector	40	Not Permitted	Partial East Side	Partial Both Sides
NE Goodwin Road	Camas	Arterial	35/40	Not Permitted	Partial South Side	Partial Both Sides
N Hargrave Street	Camas	Local Street	25	Partially Permitted	Both Sides	None
NE 28th Street	Camas/Clark County	Arterial	40	Not Permitted	Partial North Side	Partial North Side
NE 232nd Avenue	Clark County	Arterial	45	Not Permitted	None	None
SR-500	WSDOT	Regionally Significant Highway	45	Not Permitted	None	None

Table Notes: Functional classification based on City of Camas Functional Classification Map

Study Intersections

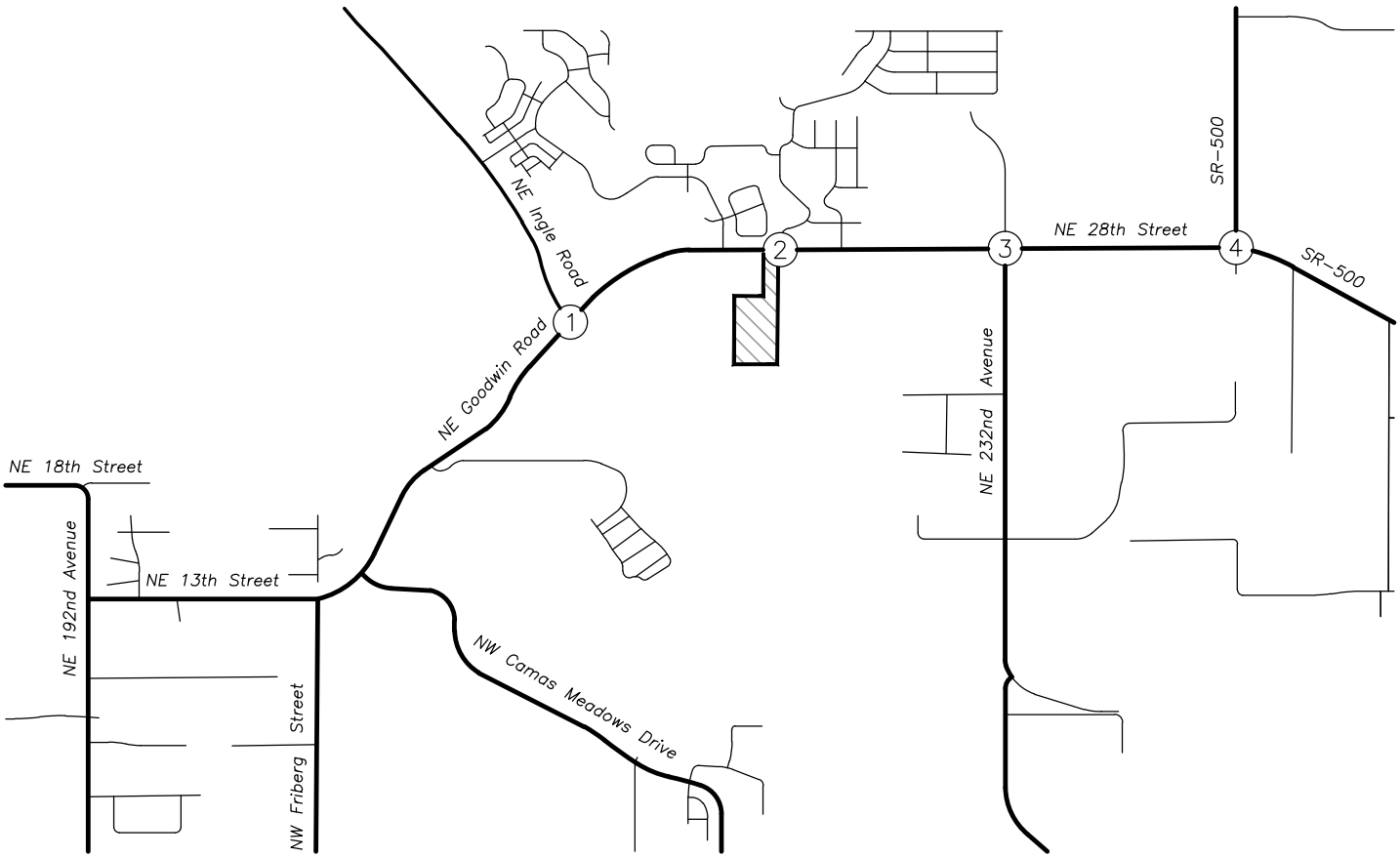
An analysis of four existing nearby intersections of significance was conducted. A summarized description of these study intersections under their existing lane configurations is provided in Table 2.

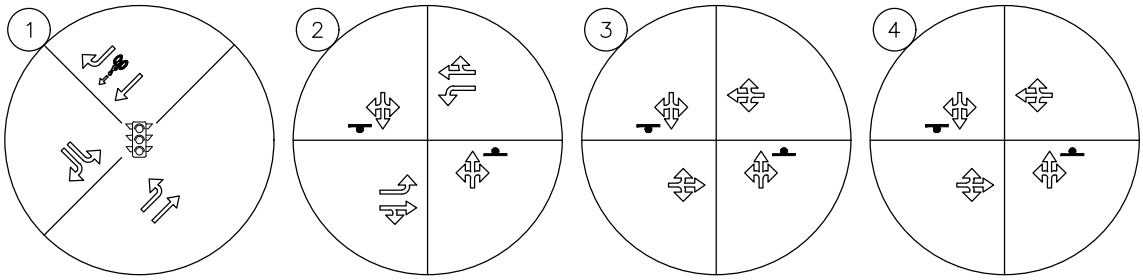
Table 2: Study Intersection Descriptions

Number	Intersection	Geometry	Traffic Control	Phasing/Stopped Approaches
1	NE Ingle Road at NE Goodwin Road	Three-Legged	Signal	FYA NEB Left-turn Lane
2	N Hargrave Street at NE 28th Street	Four-Legged	Stop-Controlled	NB/SB Stop-Controlled Approach
3	NE 232nd Avenue at NE 28th Street	Four-Legged	Stop-Controlled	NB/SB Stop-Controlled Approaches
4	SR-500 at NE 28th Street	Four-Legged	Stop-Controlled	NB/SB Stop-Controlled Approaches

Table Notes: Flashing-Yellow-Arrow denoted as FYA.

A vicinity map showing the project site, vicinity streets, and study intersection configurations are shown in Figure 2.





no scale

lancaster mobley

VICINITY MAP

Figure 2

Landing at Green Mountain Ph

4/23/2025

Site Trips

Trip Generation

The proposed Landing at Green Mountain Phase 2 subdivision will include the construction of 32 single-family detached houses, removing one existing single-family house for a net increase of 31 houses. To estimate the number of trips that are and will be generated by the existing and proposed uses, trip rates from the *Trip Generation Manual, 11th Edition*.[1] were used. Data from the land use code 210, *Single-Family Detached Housing*, was used to estimate site trip generation based on the number of dwelling units.

The trip generation calculations show that the proposed subdivision is projected to generate an additional 21 AM peak hour trips, 29 PM peak hour trips, and 292 average weekday trips. The trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included in the technical appendix.

Table 3: Site Trip Generation Summary

ITE Land Use Code		Size	AM Peak Hour			PM Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Existing Conditions									
210	Single-Family Detached Housing	1 unit	0	1	1	1	0	1	10
Proposed Conditions									
210	Single-Family Detached Housing	32 units	6	16	22	19	11	30	302
Net Change In Site Trip Generation									
Net New Trips		**31 units**	**6**	**15**	**21**	**18**	**11**	**29**	**292**

Trip Distribution

The trip distribution of the project site was derived using the Southwest Washington Regional Transportation Council (RTC) transportation system model. The project site is located in Transportation Analysis Zone (TAZ) #1829, for which a select zone analysis was run to determine the distribution of site trips entering and exiting the zone.

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

The following trip distribution is projected:

- Approximately 48% of site trips will travel to/from the southwest along NE Goodwin Road, southwest of NE Ingle Road.
- Approximately 21% of site trips will travel to/from the north along NE Ingle Road, north of NE Goodwin Road.
- Approximately 15% of site trips will travel to/from the south along NE 232nd Avenue, south of NE 28th Street.
- Approximately 9% of site trips will travel to/from the north along SR-500, north of NE 28th Street.
- Approximately 7% of site trips will travel to/from the east along SR-500, east of NE 28th Street.

The trip distribution and assignment for the site trips generated during the AM and PM peak hours are shown in Figure 3.

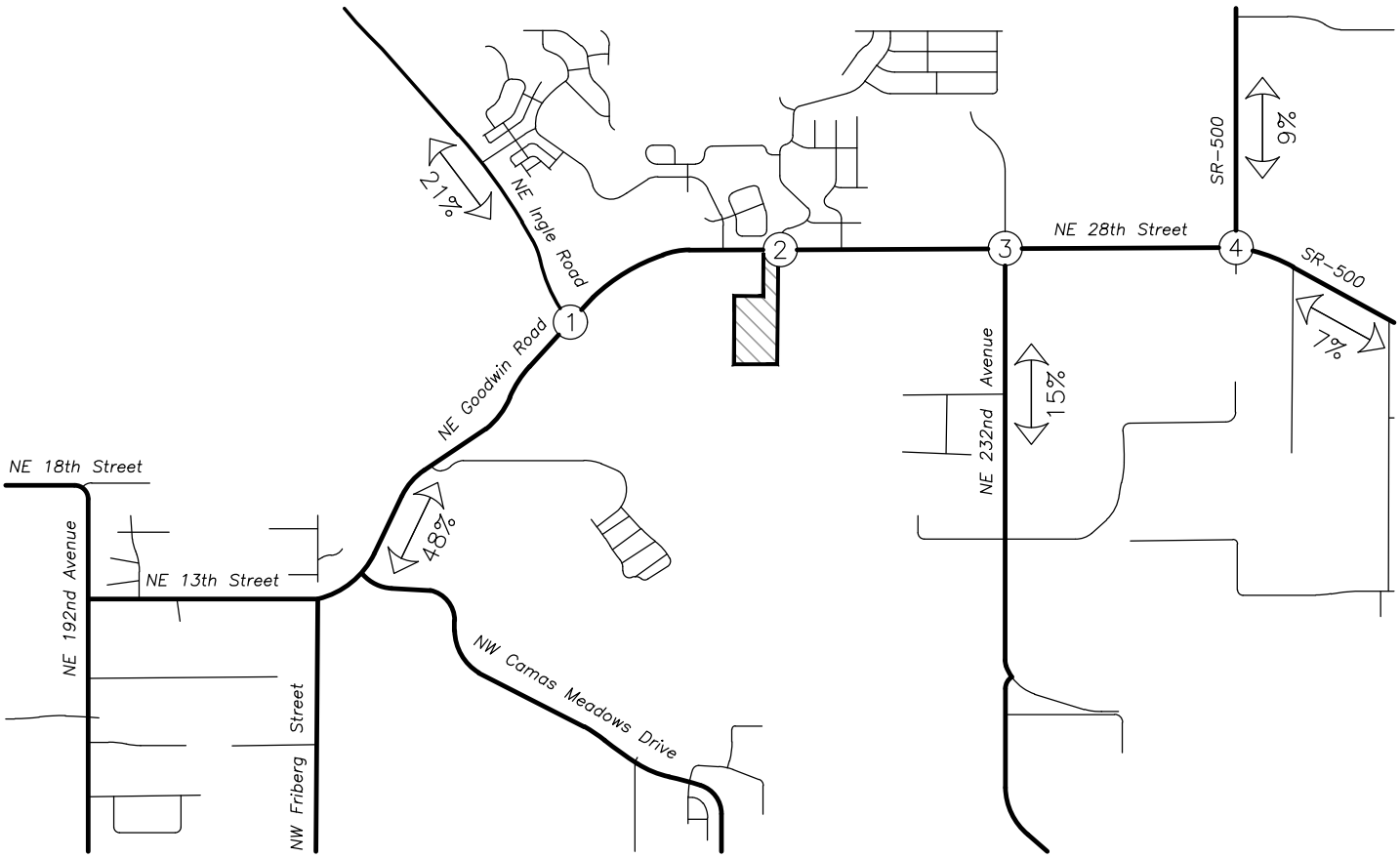
Proportionate Share Contributions

According to the project's Pre-Application Conference Report, proportionate share contributions are being collected for several transportation facilities throughout the City of Vancouver. Table 4 details these transportation improvement projects and the proportionate share fee contributions attributable to the proposed development.

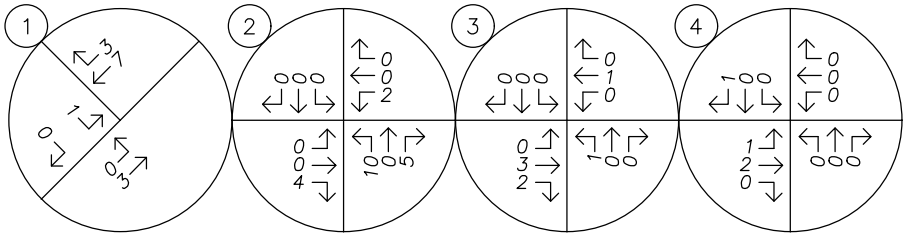
Table 4: Proportionate Share Contributions

Project Location	Unit Cost Per Trip		Percent of Site Trips Generated	Peak Hour Trip Impact		Proportionate Share Contribution
NE 137th Avenue (NE 49th Street to NE Fourth Plain Boulevard)	$3,000	PM	0.00%	0	PM	$0
NE Fourth Plain Boulevard at NE 152nd Avenue (Signal)	$333	PM	9.09%	3	PM	$999
S Lieser Road at MacArthur Boulevard/St Helens Avenue	$2,000	PM	0.00%	0	PM	$0
SE 176th Avenue at SE 20th Street	$400	PM	1.14%	0	PM	$0
NE 192nd Avenue at NE 13th Street	$400	PM	43.18%	13	PM	$5,200
SE 192nd Avenue at SE 34th Street	$150	PM	11.36%	3	PM	$450
SE 192nd Avenue at SR-14 Ramps	$2,000	PM	6.82%	2	PM	$4,000
SE 192nd Avenue at SE Columbia Palisades Drive (east/west legs only)	$830	PM	0.00%	0	PM	$0
MacArthur Boulevard at Andresen Road (Roundabout)	$2,285	PM	0.00%	0	PM	$0
MacArthur Boulevard at N Devine Road (Roundabout)	$2,226	PM	0.00%	0	PM	$0
Grove Street/SR-14 Off-Ramp at Columbia House Boulevard	$600	AM	0.00%	0	AM	$0
NE 172nd Avenue at NE 18th Street	$300	PM	9.09%	3	PM	$900
NE 179th Place at NE 18th Street	$900	PM	11.36%	3	PM	$2,700
NE 187th Avenue at NE 18th Street	$1,200	PM	13.64%	4	PM	$4,800
NE 162nd Avenue at NE 9th Street	$1,500	PM	0.00%	0	PM	$0
NE 172nd Avenue at NE 9th Street	$4,100	PM	0.00%	0	PM	$0
NE 192nd Avenue at NE 9th Street	$1,100	PM	28.41%	8	PM	$8,800
NE 187th Avenue at SE 1st Street	$1,100	PM	3.41%	1	PM	$1,100
Total Proportionate Share Contribution						**$28,949**

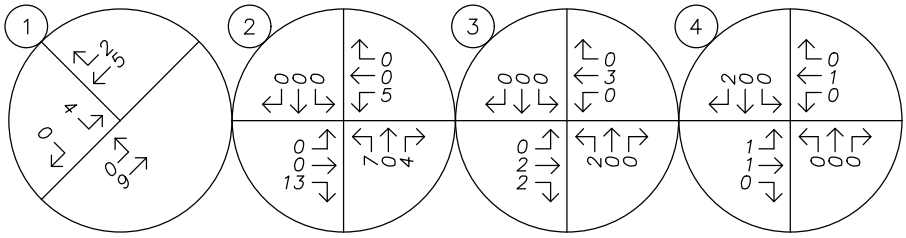
Per the RTC distribution modeling data and based on the calculated site trip generation, the proposed development is projected to impact nine of the transportation facilities where proportionate share fees are being collected. The proposed development application will need to contribute a proportionate share fee of $28,949 toward these transportation improvement projects.



AM PEAK HOUR



PM PEAK HOUR



LEGEND

XX% *PERCENT OF PROJECT TRIPS*

NET NEW TRIP GENERATION			
	IN	OUT	TOTAL
AM	6	15	21
PM	18	11	29

no scale

lancaster mobley

SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM & PM Peak Hours

Figure 3

Traffic Volumes

Existing Conditions

Traffic counts were conducted at the study intersections on Wednesday, March 12, 2025, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. Data was used from each intersection's respective AM and PM peak hours.

Figure 4 shows the year 2025 existing traffic volumes at the study intersections during the AM and PM peak hours.

Background Conditions

Volume Growth

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. In order to approximate the future year 2027 traffic volumes at the study intersections, a compounding growth rate of two percent per year for an assumed buildout condition of two years was applied to the year 2025 existing traffic volumes.

In-Process Data

In addition to the traffic volume growth described above, there are several in-process developments that are currently approved/proposed for construction within the site vicinity that are expected to impact nearby study intersections. These in-process developments include the following:

- CJ Dens East Subdivision (Approximately 40% Built)
- Green Mountain Estates Phases 1-7 (Approximately 70% Built)
- Monte Verde Subdivision (Approximately 0% Built)
- 18th Avenue Subdivision (Approximately 0% Built)
- Fresenius Kidney Care Medical Office (aka Archery Pad 5, Approximately 0% Built)
- Camas Heights Subdivision (Approximately 0% Built)
- Camas Meadows Subdivision (Approximately 0% Built)
- Camas Woods Subdivision (Approximately 0% Built)
- Valley View Estates (Approximately 40% Built)
- Green Mountain Master Plan (Approximately 75% Built)
- Hood Street Subdivision (Approximately 0% Built)
- McIntosh Subdivision (Approximately 0% Built)
- Village at Camas Meadows (Approximately 50% Built)

The in-process developments are not currently/fully contributing trips to the transportation system but may potentially be by the assumed 2027 buildout year of the site. Additional trips corresponding to each in-process development were added to the existing year traffic volumes in addition to the two years of traffic growth at

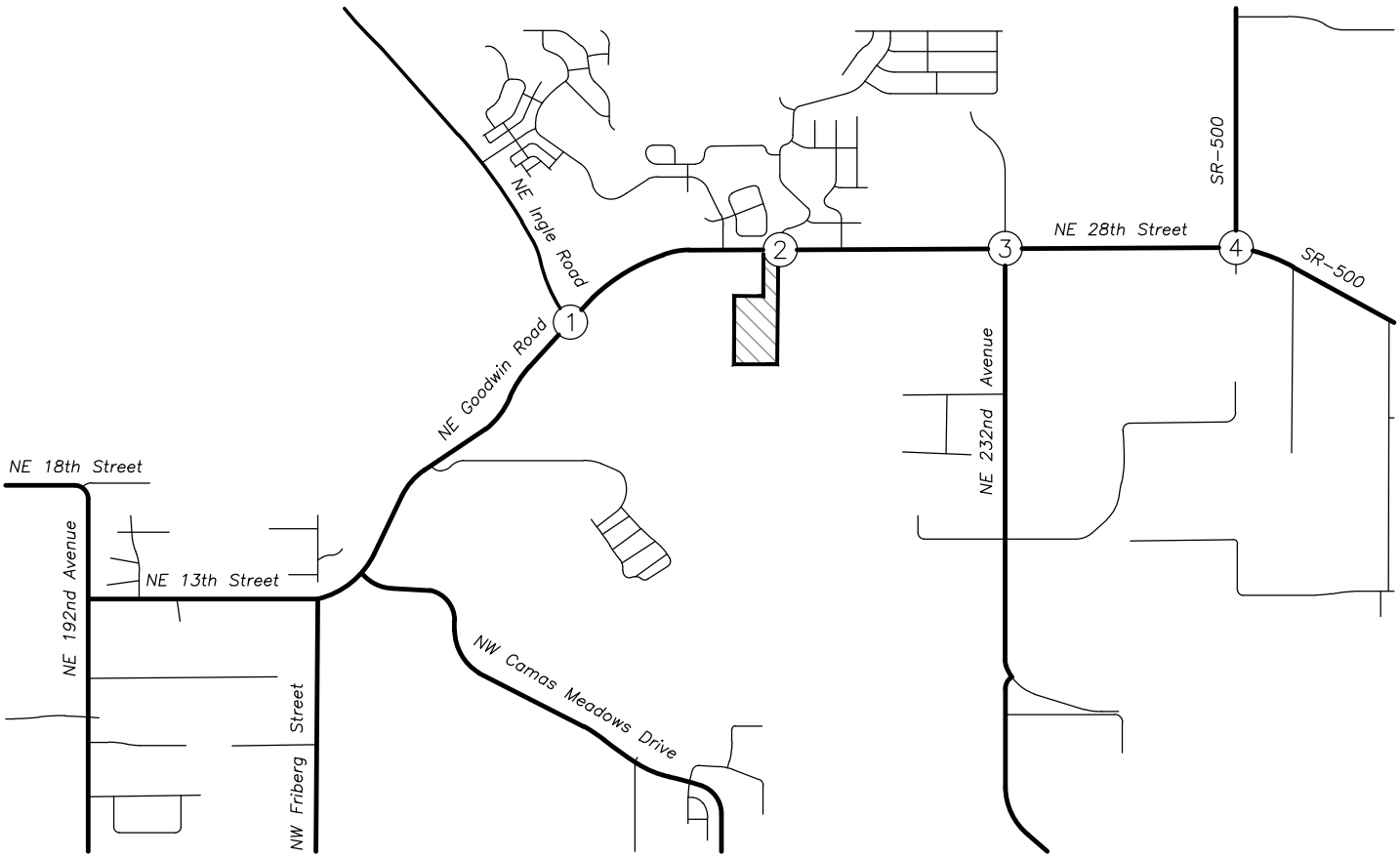
each of the applicable study intersections. To maintain a conservative analysis of operation at the study intersections, all in-process developments were assumed to be constructed by year 2027. Figure A in the technical appendix shows the in-process development trips at the study intersections during the AM and PM peak hours.

Figure 5 shows the projected year 2027 background traffic volumes at the study intersections during the AM and PM peak hours.

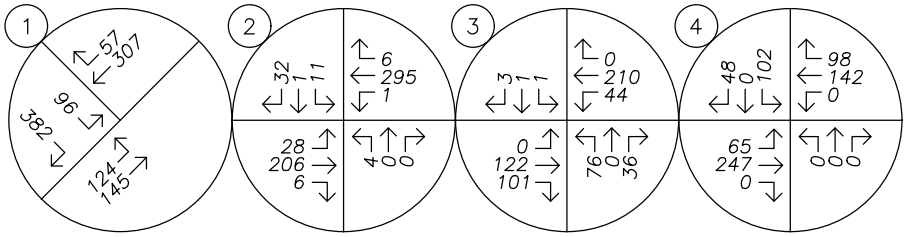
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2027 background traffic volumes to obtain the expected 2027 site buildout volumes.

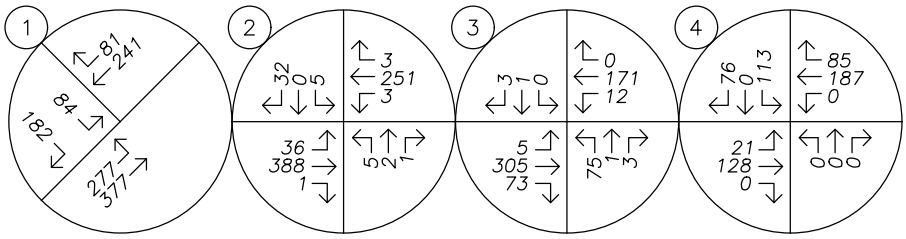
Figure 6 show the year 2027 buildout traffic volumes at the study intersections during the AM and PM peak hours.



AM PEAK HOUR



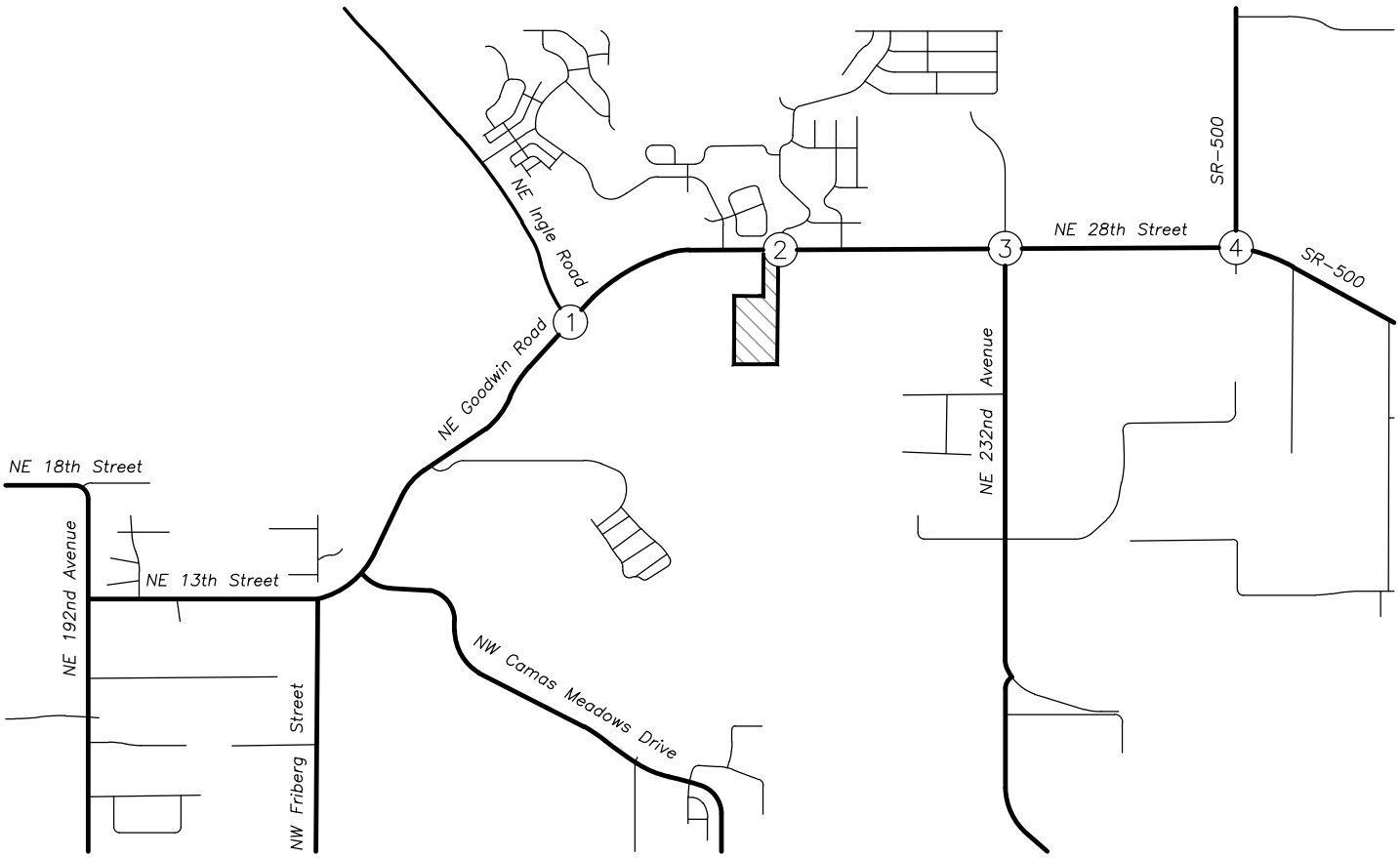
PM PEAK HOUR



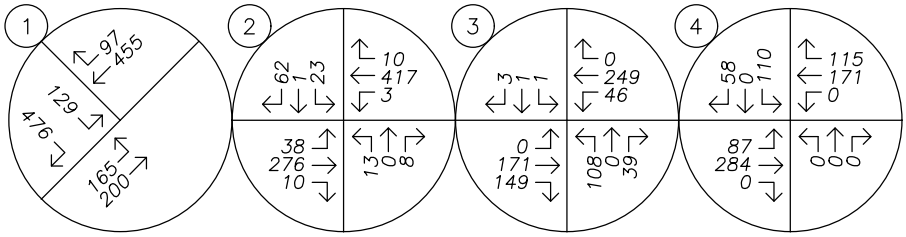
no scale

TRAFFIC VOLUMES
Year 2025 Existing Conditions
AM & PM Peak Hours

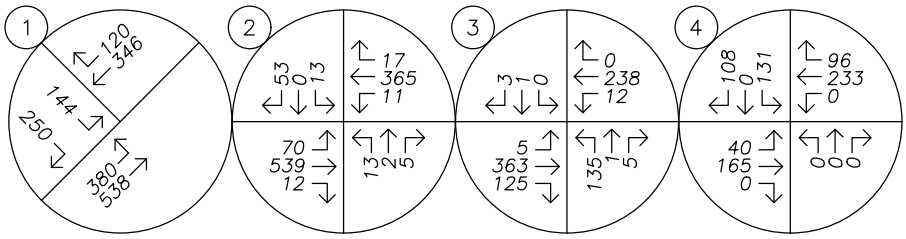
Figure 4
Landing at Green Mountain Ph
4/23/2025



AM PEAK HOUR



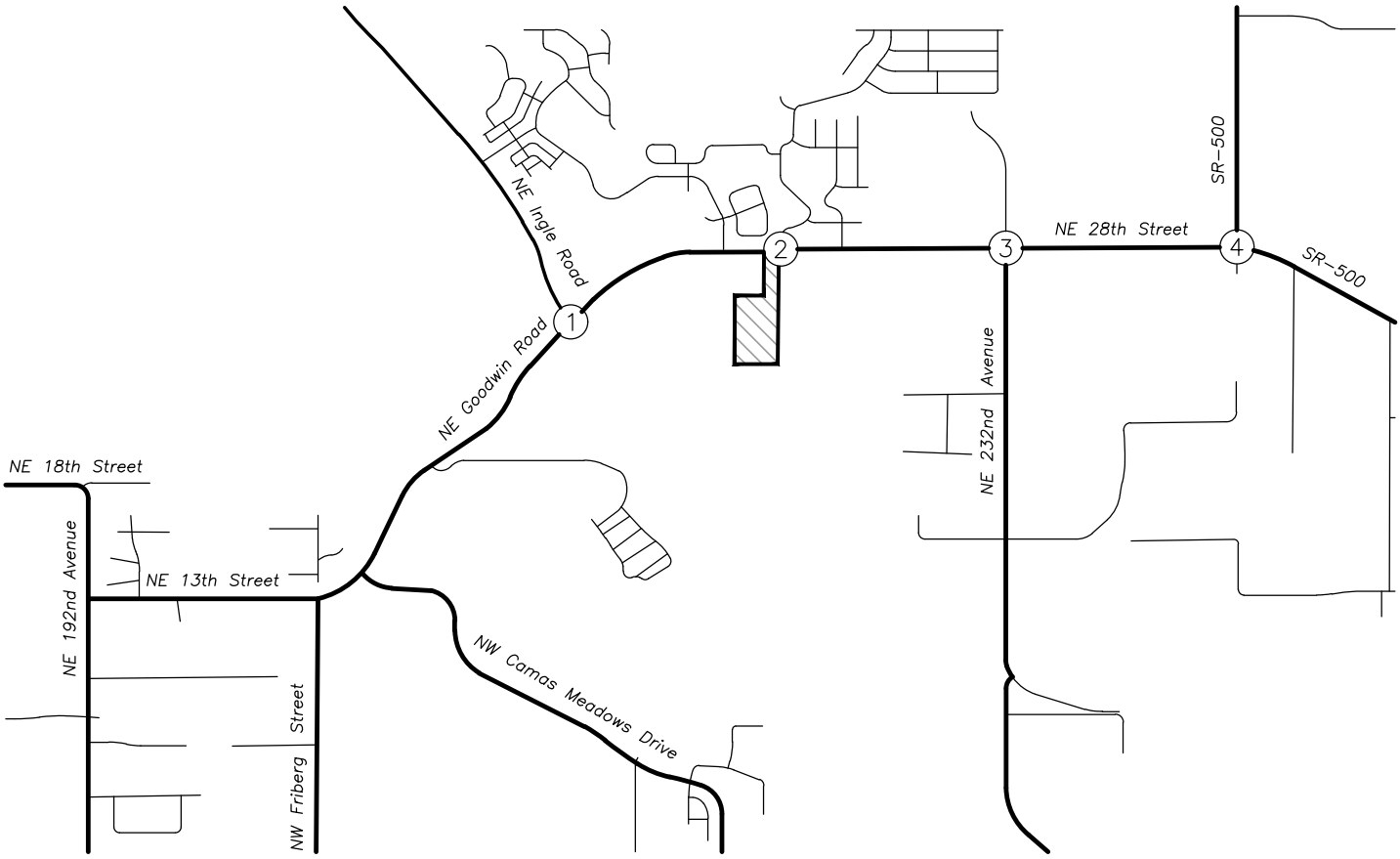
PM PEAK HOUR



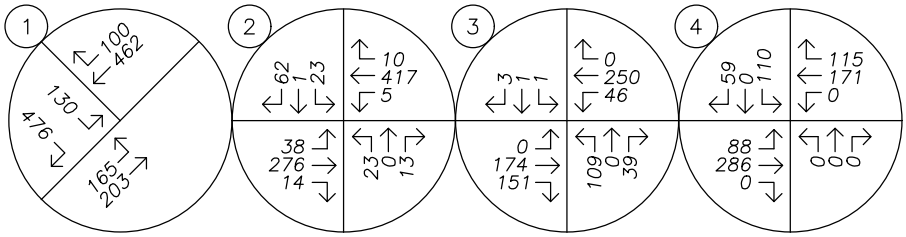
no scale

TRAFFIC VOLUMES
Year 2027 Background Conditions
AM & PM Peak Hours

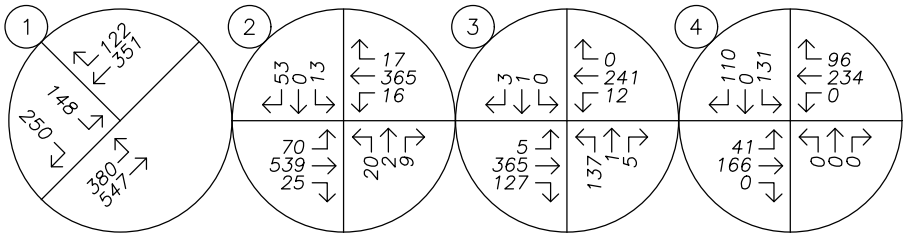
Figure 5



AM PEAK HOUR



PM PEAK HOUR



no scale

TRAFFIC VOLUMES
Year 2027 Buildout Conditions
AM & PM Peak Hours

Figure 6
Landing at Green Mountain Ph
4/23/2025

Safety Analysis

Crash History Review

Using data obtained from the Washington Department of Transportation (WSDOT) Crash Data and Reporting Branch, a review of the most recent available five to six years of crash history (January 2019 to June 2024) at the study intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection.

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the PM peak hour represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection. Crash rates in excess of 1.00 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

With regard to crash severity, WSDOT classifies crashes in the following categories:

- *No Apparent Injury* (NA);
- *Possible Injury* (P);
- *Suspected Minor Injury* (SM);
- *Suspected Serious Injury* (SS); and
- *Fatality* or *Fatal Injury*.

Table 5 provides a summary of crash types while Table 6 summarizes crash severities and rates for each of the applicable study intersections. Crash data is included in the technical appendix to this report.

Table 5: Crash Type Summary

No.	Intersection	Crash Type							Total
		Rear End	Turn	Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	NE Ingle Road at NE Goodwin Road	0	7	0	0	0	1	0	8
2	N Hargrave Street at NE 28th Street	0	0	0	0	0	0	0	0
3	NE 232nd Avenue at NE 28th Street	1	6	0	2	0	1	0	10
4	SR-500 at NE 28th Street	0	2	2	0	0	0	0	4

Table 6: Crash Severity and Rate Summary

No.	Intersection	Crash Severity					Total Crashes	AADT	Crash Rate
		NA	P	SM	SS	Unknown			
1	NE Ingle Road at NE Goodwin Road	4	1	3	0	0	8	12,420	0.32
2	N Hargrave Street at NE 28th Street	0	0	0	0	0	0	7,270	0.00
3	NE 232nd Avenue at NE 28th Street	7	1	1	0	1	10	6,490	0.77
4	SR-500 at NE 28th Street	3	1	0	0	0	4	6,100	0.33

Per Table 6, two of the reported crashes at the study intersections involved bicyclists. The crashes include the following:

- One of the crashes occurred at the intersection of NE Ingle Road at NE Goodwin Road. The crash occurred when the driver of a northeast bound left-turning passenger car failed to yield right-of-way to a bicyclist at the intersection. One person involved in the collision was reported to have sustained injuries, where the crash was classified as *Suspected Minor Injury*.
- The second crash occurred at the intersection of NE 232nd Avenue at NE 28th Street. The crash occurred when the bicyclist conducted an improper turn/merge at the intersection and collided with a westbound traveling passenger car. The crash was classified as *No Apparent Injury*.

Based on a review of the crash history data, no significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.

Warrant Analysis

Preliminary traffic signal and preliminary all-way stop-control warrants were examined for the study intersections where such treatments would be applicable.

Preliminary Traffic Signal Warrants

Preliminary traffic signal warrants were examined for the unsignalized study intersections to determine whether the installation of a new traffic signal will be warranted at the intersections by the 2027 site buildout year. Based on the preliminary analysis following a review of Warrant 1 in the *Manual on Uniform Traffic Control Devices*, or MUTCD, traffic signal warrants are not projected to be met at any of the unsignalized study intersections by the 2027 site buildout year. Therefore, no new traffic signals are necessary or recommended as part of the proposed development application.

All-Way Stop-Control Warrants

To determine whether the installation of all-way stop-controls is warranted or nearing warrants at the applicable study intersections, the *Manual of Uniform Traffic Control Devices for Streets and Highways*[2] (MUTCD) was referenced. According to *Section 2B.12 All-Way Stop Control* of the MUTCD, installation of all-way stop controls may be considered at an intersection based on a review of the following warrants:

A. *All-Way Stop Control Warrant A: Crash Experience (see Section 2B.13)*

B. *All-Way Stop Control Warrant B: Sight Distance (see Section 2B.14)*

C. *All-Way Stop Control Warrant C: Transition to Signal Control or Transition to Yield Control at a Circular Intersection (see Section 2B.15)*

D. *All-Way Stop Control Warrant D: 8-Hour Volume (Vehicles, Pedestrians, Bicycles) (see Section 2B.16)*

E. *All-Way Stop Control Warrant E: Other Factors (see Section 2B.17)*

Note that according to the MUTCD, "[t]*he decision to install all-way stop control on site roadways open to public travel may be based on engineering judgment*" and "[w]*arrants are not a substitute for engineering judgment. The fact that a warrant for a particular traffic control device is met is not conclusive justification to install or not install all-way stop control.*"

Upon reviewing the aforementioned criteria, the following were concluded for each applicable warrant at the applicable unsignalized study intersections:

A. Three or less crashes over a 12-month period that could have been mitigated with the installation of all-way stop-controls were found at the study intersections via WSDOT crash data. Therefore, Warrant A is not met for any of the applicable study intersections.

B. Based on a preliminary review of intersection sight distances, no sight distance issues beyond the potential need to maintain foliage within the public right-of-way of applicable study intersections were found. Therefore, Warrant B is not met for any of the applicable study intersections.

C. Traffic signal warrants are not projected to be met at any of the applicable study intersections, whereby Warrant C is not met.

D. Based on a preliminary review of the volume warrant at the applicable study intersections, Warrant D is not projected to be met by the 2027 site buildout year.

E. Neither the need to control left-turn conflicts or further accommodate current pedestrian/bicycle volumes at the study intersections is necessary. Additionally, the study intersections are not composed of two residential neighborhood collector roads of similar design. Therefore, Warrant E is not met for any of the applicable study intersections.

[2] Federal Highway Administration (FTA), American Traffic Safety Services Association (ATSSA), Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), 11th Edition, 2023.

Based on the review of all-way stop-control warrants, the installation of all-way stop-controls at any of the applicable study intersections by the 2027 site buildout year is not necessary or recommended. Therefore, no all-way stop-control mitigation at the study intersections is recommended as part of the proposed development.

Pedestrian and Bicycle Safety

Intermittent sidewalks and bicycle lanes are in place along the site adjacent roadway of NE 28th Street. These facilities are generally provided along segments of the roadway where recent, higher density residential subdivision projects have been developed. As the area continues to redevelop with higher intensive uses, it is expected that segments of area roadways that do not currently have sidewalks or bicycle lanes will be reconstructed with such facilities overtime. Note that construction of these facilities is contingent on private development projects, such as the proposed Landing at Green Mountain Phase 2 subdivision, which will redeveloped their associated half-street frontages. Since the proposed development will reconstruct its street frontage with NE 28th Street, no further mitigation to pedestrian and bicycle facilities are necessary and recommended as part of the development application.

Specific to safety related to students walking/biking between the project site and nearby schools, the nearest schools to the project site include the following:

- Lacamas Lake Elementary School: An approximate 1.5 mile walking/biking distance to the southeast from the project site.
- Union High School: An approximate 2 mile walking/biking distance to the southwest from the project site.
- Illahee Elementary School and Shahala Middle School: An approximately 2.5 mile walking/biking distance to the southwest from the project site.
- Harmony Elementary School: An approximate 3 mile walking/biking distance to the west from the project site.
- Skyridge Middle School: An approximate 3 mile walking/biking distance to the south from the project site.

Given the lengthy travel distances between the nearest schools and the project site, it is unlikely that students who reside at the Landing at Green Mountain Phase 2 subdivision will walk or bike to school. Instead students may either travel to/from school via personal/family vehicles or will take a school bus, noting C-Tran does not currently offer transit services in the immediate site vicinity. School bus service to/from the project site will be coordinated with the applicable school districts. Based on the proposed site layout, school buses have the option of either stopping along NE 28th Street near the intersection of N Hargrave Street at NE 28th Street or enter the project site and circulate within the site internal streets. For either school bus service option, appropriate pedestrian and bicycle facilities will be constructed/available within site internal streets and along the project site's frontage with NE 28th Street. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed subdivision.

Operational Analysis

Intersection Capacity Analysis

A capacity and delay analysis were conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM).[3]. Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

According to the City of Camas Engineering Design Standards, a minimum LOS C or better on minor and local streets, and LOS D on collector/arterials or better should be maintained for traffic operations.

According to Clark County's Unified Development Code, Title 40.350 – *Transportation and Circulation*, Clark County's performance standards require unsignalized intersections to operate at LOS E or better unless traffic signal warrants are met. If traffic signal warrants are met, the intersection is required to operate at LOS D or better. Individual movements at signalized intersections of regional significance are to operate with average delays of less than two cycle lengths or 240 seconds, whichever is less.

The study intersection along SR-500 operates under the jurisdiction of WSDOT. According to the Revised Code of Washington (RCW) 47.06.140(2):

> *The department of transportation, in consultation with local governments, shall set level of service standards for state highways and state ferry routes of statewide significance. Although the department shall consult with local governments when setting level of service standards, the department retains authority to make final decisions regarding level of service standards for state highways and state ferry routes of statewide significance. In establishing level of service standards for state highways and state ferry routes of statewide significance, the department shall consider the necessary balance between providing for the free interjurisdictional movement of people and goods and the needs of local communities using these facilities…*

Per WSDOT's online *Level of Service Standard* ArcGIS website.[4], the segment of SR-500 within the analysis area operates with an LOS C or better standard.

[3] Transportation Research Board, *Highway Capacity Manual 7th Edition*, 2022.

[4] WSDOT. (n.d.). *WSDOT - Level of Service Standard*. Map Viewer. https://wsdot.maps.arcgis.com/apps/mapviewer/index.html?layers=3f840aeeb1ba481c905270ca103cd1db

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 7 for the AM and PM peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

Table 7: Capacity Analysis Summary

Analysis Scenario	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1. NE Ingle Road at NE Goodwin Road (City of Camas)						
2025 Existing Conditions	A	9	-	A	7	-
2027 Background Conditions	B	12	-	A	9	-
2027 Buildout Conditions	B	13	-	A	9	-
2. N Hargrave Street at NE 28th Street (City of Camas)						
2025 Existing Conditions	B	12	0.09	B	13	0.06
2027 Background Conditions	B	14	0.20	C	17	0.13
2027 Buildout Conditions	C	14	0.21	C	17	0.13
3. NE 232nd Avenue at NE 28th Street (Clark County)						
2025 Existing Conditions	C	19	0.38	C	15	0.18
2027 Background Conditions	E	37	0.67	C	23	0.42
2027 Buildout Conditions	E	38	0.68	C	23	0.43
4. NE 242nd Avenue (SR-500) at NE 28th Street (WSDOT)						
2025 Existing Conditions	C	16	0.32	C	16	0.40
2027 Background Conditions	C	20	0.43	C	24	0.60
2027 Buildout Conditions	C	21	0.43	C	24	0.61

Based on the results of the operational analysis, all study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application.

Intersection Queuing Analysis

In accordance with the City of Camas Engineering Design Standards, a queuing analysis was conducted at the study intersections to determine whether sufficient storage is available at applicable turning movements to accommodate projected queues.

The queue lengths were projected based on the results of a Synchro/SimTraffic simulation, with the reported values representing the 95th percentile queue length. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

The projected 95th percentile queue lengths reported in the simulation are presented in Table 8 for the AM and PM peak hours. Note the reported queue lengths were rounded up to the nearest five feet. Available lane storages at applicable turning movements were rounded to the nearest five feet. Detailed queuing analysis worksheets are included in the technical appendix to this report.

Table 8: Queuing Analysis Summary

		Available Storage (ft)	AM Peak Hour 95th (ft)	PM Peak Hour 95th (ft)
1. NE Ingle Road at NE Goodwin Road				
2025 Existing Conditions	NEB LT	115	90	115
	NEB Through	-	75	95
	SWB Through	-	155	120
	SWB RT	100	50	55
	SEB LT	110	75	70
	SEB RT	-	145	70
2027 Background Conditions	NEB LT	115	110	**175**
	NEB Through	-	100	145
	SWB Through	-	235	200
	SWB RT	100	70	65
	SEB LT	110	95	100
	SEB RT	-	230	100
2027 Buildout Conditions	NEB LT	115	105	**175**
	NEB Through	-	90	150
	SWB Through	-	255	200
	SWB RT	100	65	70
	SEB LT	110	100	100
	SEB RT	-	215	100

Table Notes: ***BOLDED*** *text indicates queue length exceeds avaialble storage.*

Table 8: Queuing Analysis Summary (Continued)

		Available Storage (ft)	AM Peak Hour	PM Peak Hour
			95th (ft)	95th (ft)
2. N Hargrave Street at NE 28th Street				
2025 Existing Conditions	EB LT	-	35	30
	WB LT	-	0	10
	NB Lane	-	20	35
	SB Lane	-	50	50
2027 Background Conditions	EB LT	-	45	45
	WB LT	-	10	20
	NB Lane	-	40	50
	SB Lane	-	60	55
2027 Buildout Conditions	EB LT	-	45	45
	WB LT	-	10	30
	NB Lane	-	50	60
	SB Lane	-	65	60
3. NE 232nd Avenue at NE 28th Street				
2025 Existing Conditions	NB Lane	-	75	65
	SB Lane	-	20	25
2027 Background Conditions	NB Lane	-	95	90
	SB Lane	-	25	25
2027 Buildout Conditions	NB Lane	-	110	95
	SB Lane	-	20	30
4. SR-500 at NE 28th Street				
2025 Existing Conditions	NB Lane	-	0	0
	SB Lane	-	85	95
2027 Background Conditions	NB Lane	-	0	0
	SB Lane	-	95	120
2027 Buildout Conditions	NB Lane	-	0	0
	SB Lane	-	95	115

Table Notes: ***BOLDED*** *text indicates queue length exceeds avaialble storage.*

Based on the queuing analysis, the northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. This extended queuing is projected to occur under the year 2027 analysis scenarios during the PM peak hour, with or without buildout of the proposed development. The maximum 95th percentile is projected to be approximately 175 feet, where the available striped storage area is approximately 115 feet. Although the 95th percentile queue may exceed the available striped storage area by approximately 60 feet (i.e., the length of 2 to 3 passenger cars), this excess queue can be accommodated by the northeast bound through lane, which experiences a 95th percentile queue of up to 150 feet for a total of 210 feet of queuing along the through lane. This 210-foot queue will not extend back to any other public intersection or driveway along NE Goodwin Road, whereby limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development.

Conclusions

The proposed development is projected to impact nine of the transportation facilities where proportionate share fees are being collected by the City of Vancouver. The proposed development application will need to contribute a proportionate share fee of $28,949 toward these transportation improvement projects.

No significant trends or crash patterns were identified at any of the study intersections that are indicative of safety concerns. Accordingly, no crash-related mitigation is necessary or recommended as part of the proposed development application.

Traffic signal and all-way stop-control warrants are not projected to be met at any of the applicable study intersections under any analysis scenario through the 2027 site buildout year. Accordingly, no revisions to traffic controls are necessary or recommended as part of the proposed Landing at Green Mountain Phase 2 project.

The proposed development will reconstruct its associated street frontage with NE 28th Street to include pedestrian and bicycle facilities in accordance with City of Camas street standards. Additionally, appropriate pedestrian and bicycle facilities will be constructed within site internal streets to accommodate student pickup/drop-off via school bus. Therefore, adequate pedestrian and bicycle facilities will be available to accommodate students who may reside within the proposed Landing at Green Mountain Phase 2 subdivision, and no further mitigation to pedestrian and bicycle facilities are necessary and recommended.

All study intersections are currently operating acceptably per applicable agency standards and are projected to continue operating acceptably through the 2027 buildout year of the site. Accordingly, no operational mitigation is necessary or recommended at the study intersections as part of the proposed development application.

The northeast bound left-turn lane at the intersection of NE Ingle Road at NE Goodwin Road is projected to experience 95th percentile queues which exceed the available striped lane storage. However, this excess queue can be accommodated by the northeast bound through lane without extending back to any other public intersection or driveway along NE Goodwin Road. Limited to no impacts to other intersections, as well as the study intersection itself, are expected to occur due to this queuing. Therefore, no queuing-related mitigation at the intersection is recommended as part of the proposed development.

Appendix A – Site Plan

Site Plan

The Landing At Green Mountain 2

Located in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

APPLICANT:
Pacific Lifestyle Homes
Contact: Nick Edwards
11815 NE 99th St
Vancouver, WA 98682
(360) 597-7098
NickE@buildplh.com

OWNERS:
Emmert Family III LLC
10470 SE Hillcrest Dr
Happy Valley, OR 97086

Dan Elzinga
22007 NE 28th Street
Camas, WA, 98607

Linda Middagh
22015 NE 28th Street
Camas, WA, 98607

PROJECT CONTACT:
PLS Engineering
Jayson Taylor, PE
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

SITE LOCATION:
Parcel # 173177000
Parcel # 173210000
Parcel # 173169000

22111 NE 28th Street Camas, WA 98607
22007 NE 28th Street Camas, WA, 98607
22015 NE 28th Street Camas, WA, 98607

LAND USE:
The applicant is proposing a 51 lot subdivision in the R7.5 zone.

Per Municipal Code section 18.09.060, density transfer is proposed with the inclusion of a park area that has 0.5 acres of contiguous area. We are requesting flexibility to the minimum lot width standards with the proposed park and trail on the south end of the site.

The applicant is proposing to develop a modified parcel #17317700 that will contain 10.6 acres. A proposed BLA will reduce parcel 17321000 to 1.96 acres and parcel 173169000 to 1.95 acres. The applicant is requesting to submit the BLA application concurrent with the preliminary subdivision application. The intent is to process the subdivision application as if the site does not include the other two parcels. The BLA will be recorded prior to final engineering approval.
The site is bordered by NE 28th Street and Green Mountain Subdivision to the north, recently constructed Monte Verde Subdivision (SUB22-05) to the east, a single-family residence to the west and Camp Currie to the south. A BPA righ-of-way runs diagonally through the site.

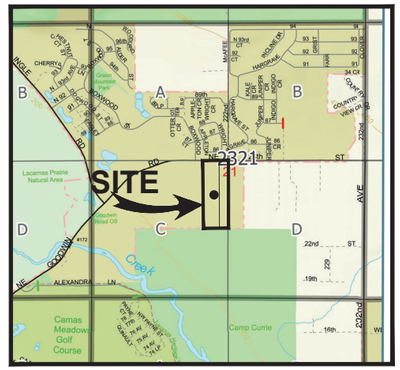
Proposed Development Area = 10.6 Acres
Proposed open space = 1.19 Acres
Minimum Proposed Lot Area = 5000 sq-ft
Maximum Proposed Lot Area = 8581 sq-ft
Average Lot Area = 5695 sq-ft
Min. Lot Width = 45'
Proposed Density = 5.42 d.u./net acre (51 lots)
Maximum Density = 5.80 d.u./net acre (54 lots)

TRANSPORTATION:
For primary access to the site the applicant is proposing to construct a roadway connection to NE 26th Street that is being constructed by the project to the east. NE 28th Street is classified as a 3-land collector/arterial. Half width improvements are proposed for this public roadway. Internal public roadways will consist of private and public local access roadways.

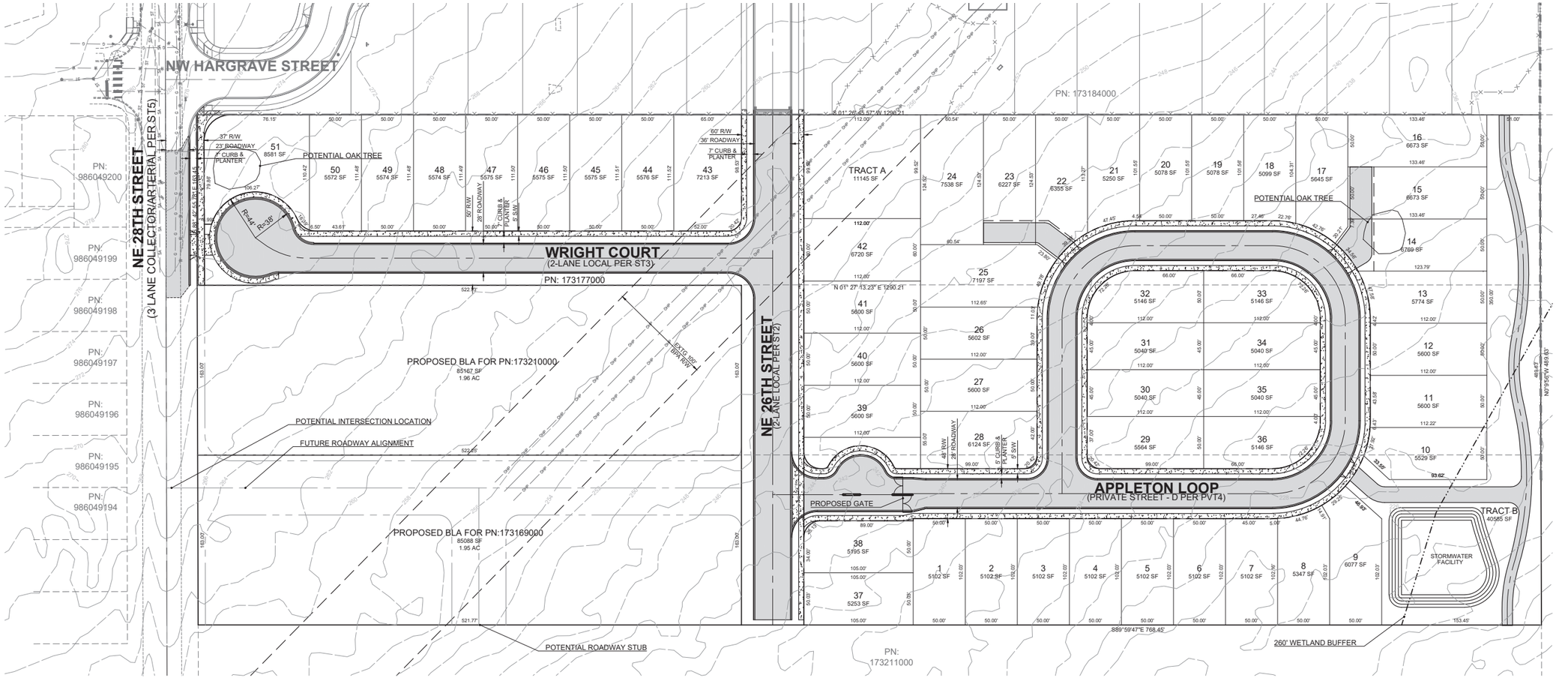
UTILITIES:
Stormwater runoff is proposed to be collected and routed to a detention facility located on the south end of the site, runoff generated from pollution generating surfaces will be treated prior to entering the stormwater facility.

The site will be served by public water and sanitary sewer provided by the City of Camas. Due to the existing grade of the site that slopes away from NE 28th Street, only a few lots can be served by gravity sewer service. A majority of the lots will need to utilize a grinder pump system.

There is an existing well and septic system located on the site that are proposed to be removed/abandoned.



VICINITY MAP
NOT TO SCALE



Scale 1" = 50'
50 25 0 50

Legend	
Proposed Asphalt	
Proposed Concrete	

Conceptual Plat For:

The Landing At Green Mountain 2

A Site Located in the City of Camas, WA

Engineering - Surveying - Planning | 604 W. Evergreen Blvd. Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

PLS ENGINEERING

Revisions

1	2	3	4	5	6

Project No.	3886
SCALE:	H: 1' = 50' V: N/A
DESIGNED BY:	JMT
DRAFTED BY:	JMT
REVIEWED BY:	TGJ

01 of 01

Appendix B – Trip Generation and Distribution

Trip Generation Calculations

RTC TAZ Data

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition
Site Trips - Existing Conditions

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	1

WARNING: Variable Quantity is less than Minimum Survey Size for Peak Hours

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	25%	75%	
Trip Ends	0	1	1

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	1	0	1

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	5	5	10

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	5	5	10

Source: Trip Generation Manual, 11th Edition

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition
Site Trips - Proposed Conditions

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	32

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	25%	75%	
Trip Ends	6	16	22

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	19	11	30

WEEKDAY

Trip Rate: 9.43

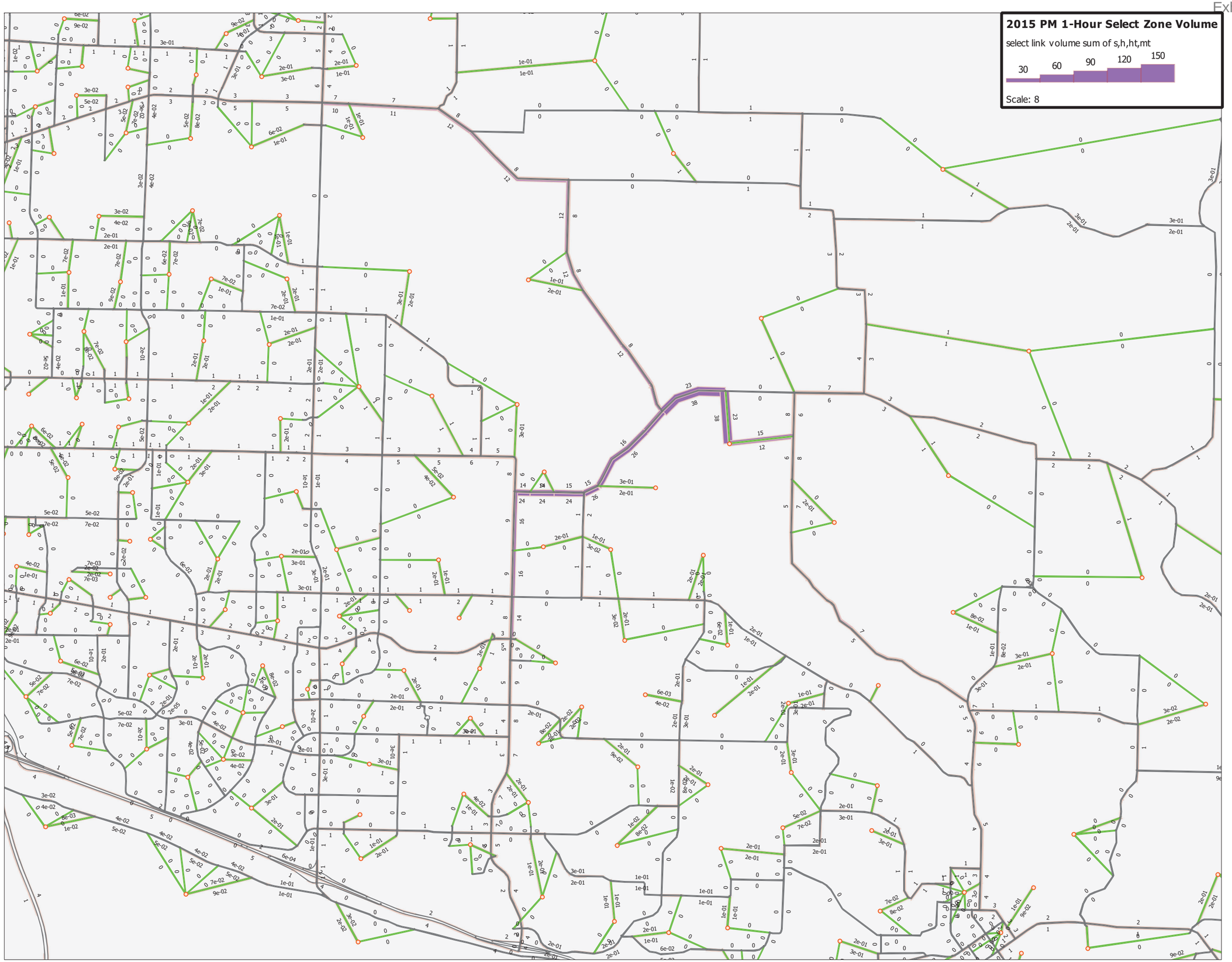
	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	151	151	302

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	152	152	304

Source: Trip Generation Manual, 11th Edition


2015 PM 1-Hour Select Zone Volume
select link volume sum of s,h,ht,mt
30
60
90
120
150
Scale: 8

Appendix C – Traffic Volumes

Traffic Counts

In-Process Trips

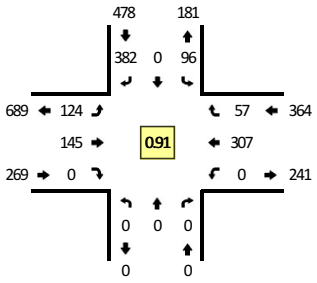
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

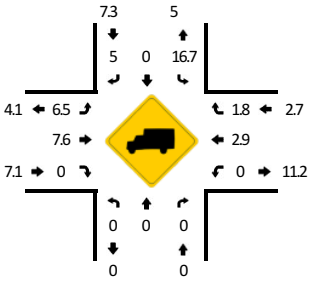
LOCATION: NE Ingle Rd -- NE Goodwin Rd/NE 28th St
CITY/STATE: Camas, WA

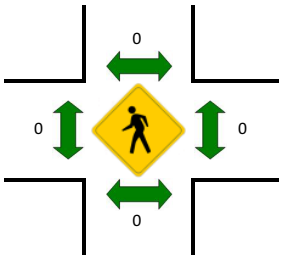
QC JOB #: 16956001
DATE: Wed, Mar 12 2025

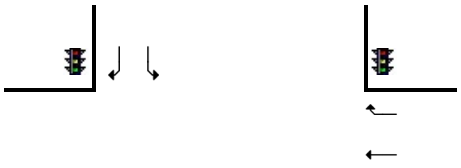
Peak-Hour: 7:50 AM -- 8:50 AM
Peak 15-Min: 8:35 AM -- 8:50 AM

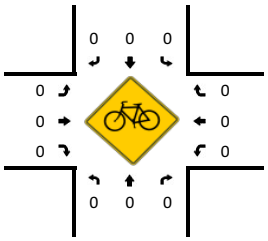


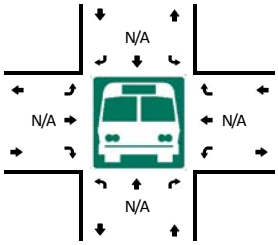




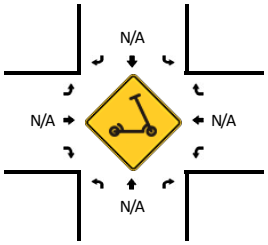












5-Min Count Period Beginning At	NE Ingle Rd (Northbound)				NE Ingle Rd (Southbound)				NE Goodwin Rd/NE 28th St (Eastbound)				NE Goodwin Rd/NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	9	0	15	0	6	8	0	0	0	10	6	0	54	
7:05 AM	0	0	0	0	3	0	15	0	6	7	0	0	0	12	7	0	50	
7:10 AM	0	0	0	0	9	0	9	0	7	8	0	0	0	20	1	0	54	
7:15 AM	0	0	0	0	3	0	12	0	7	6	0	0	0	15	6	0	49	
7:20 AM	0	0	0	0	6	0	19	0	6	10	0	0	0	14	3	0	58	
7:25 AM	0	0	0	0	9	0	20	0	8	8	0	0	0	20	4	0	69	
7:30 AM	0	0	0	0	7	0	25	0	8	7	0	0	0	19	8	0	74	
7:35 AM	0	0	0	0	11	0	22	0	5	7	0	0	0	35	6	0	86	
7:40 AM	0	0	0	0	6	0	35	0	8	10	0	0	0	24	4	0	87	
7:45 AM	0	0	0	0	12	0	31	0	3	15	0	0	0	33	4	0	98	
7:50 AM	0	0	0	0	8	0	39	0	6	23	0	0	0	23	4	0	103	
7:55 AM	0	0	0	0	5	0	31	0	4	12	0	0	0	24	5	0	81	863
8:00 AM	0	0	0	0	14	0	30	0	7	15	0	0	0	31	7	0	104	913
8:05 AM	0	0	0	0	7	0	25	0	13	12	0	0	0	27	5	0	89	952
8:10 AM	0	0	0	0	5	0	23	0	7	14	0	0	0	24	5	0	78	976
8:15 AM	0	0	0	0	6	0	36	0	4	5	0	0	0	20	4	0	75	1002
8:20 AM	0	0	0	0	6	0	32	0	7	10	0	0	0	23	9	0	87	1031
8:25 AM	0	0	0	0	13	0	45	0	17	7	0	0	0	22	4	0	108	1070
8:30 AM	0	0	0	0	2	0	38	0	10	12	0	0	0	18	1	0	81	1077
8:35 AM	0	0	0	0	9	0	45	0	10	11	0	0	0	37	3	0	115	1106
8:40 AM	0	0	0	0	8	0	20	0	12	9	0	0	0	30	7	0	86	1105
8:45 AM	0	0	0	0	13	0	18	0	27	15	0	0	0	28	3	0	104	1111
8:50 AM	0	0	0	0	5	0	21	0	11	15	0	0	0	25	3	0	80	1088
8:55 AM	0	0	0	0	8	0	13	0	9	12	0	0	0	15	4	0	61	1068

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	120	0	332	0	196	140	0	0	0	380	52	0	1220
Heavy Trucks	0	0	0		36	0	12		16	4	0		0	4	4		76
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

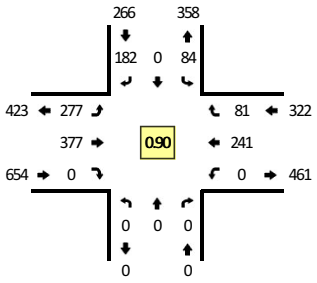
Type of peak hour being reported: Intersection Peak

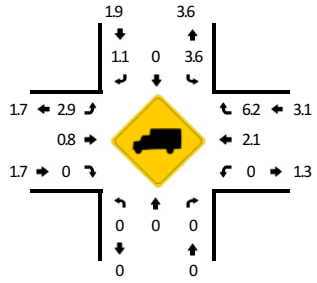
Method for determining peak hour: Total Entering Volume

LOCATION: NE Ingle Rd -- NE Goodwin Rd/NE 28th St
CITY/STATE: Camas, WA

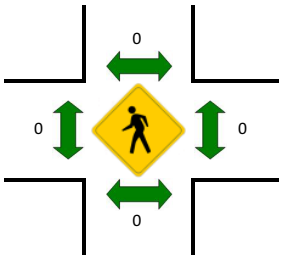
QC JOB #: 16956002
DATE: Wed, Mar 12 2025

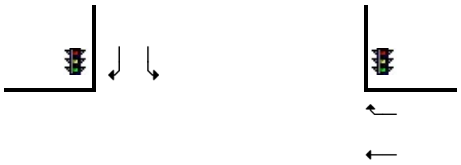
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

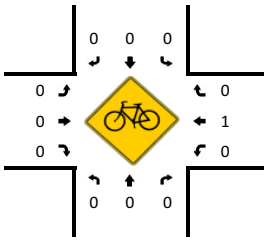


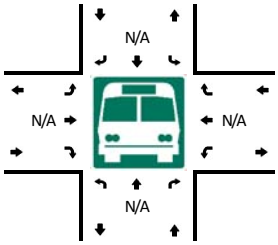


TRUE DATA TO IMPROVE MOBILITY

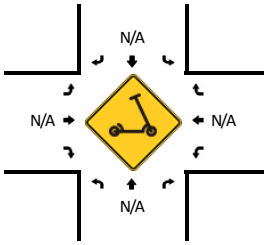












5-Min Count Period Beginning At	NE Ingle Rd (Northbound)				NE Ingle Rd (Southbound)				NE Goodwin Rd/NE 28th St (Eastbound)				NE Goodwin Rd/NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	10	0	8	0	17	34	0	0	0	11	9	0	89	
4:05 PM	0	0	0	0	12	0	9	0	13	24	0	0	0	17	7	0	82	
4:10 PM	0	0	0	0	10	0	12	0	26	29	0	0	0	21	9	0	107	
4:15 PM	0	0	0	0	6	0	17	0	25	27	0	0	0	15	3	0	93	
4:20 PM	0	0	0	0	12	0	17	0	23	22	0	0	0	15	3	0	92	
4:25 PM	0	0	0	0	7	0	15	0	34	24	0	0	0	16	4	0	100	
4:30 PM	0	0	0	0	5	0	12	0	28	29	0	0	0	18	15	0	107	
4:35 PM	0	0	0	0	4	0	11	0	12	27	0	0	0	23	4	0	81	
4:40 PM	0	0	0	0	7	0	20	0	19	25	0	0	0	26	11	0	108	
4:45 PM	0	0	0	0	4	0	15	0	18	36	0	0	0	22	8	0	103	
4:50 PM	0	0	0	0	6	0	18	0	21	31	0	0	0	23	3	0	102	
4:55 PM	0	0	0	0	11	0	12	0	16	29	0	0	0	15	3	0	86	1150
5:00 PM	0	0	0	0	6	0	10	0	19	50	0	0	0	21	6	0	112	1173
5:05 PM	0	0	0	0	3	0	18	0	29	24	0	0	0	21	4	0	99	1190
5:10 PM	0	0	0	0	9	0	14	0	29	28	0	0	0	13	5	0	98	1181
5:15 PM	0	0	0	0	13	0	21	0	32	36	0	0	0	15	8	0	125	1213
5:20 PM	0	0	0	0	8	0	23	0	23	32	0	0	0	18	7	0	111	1232
5:25 PM	0	0	0	0	8	0	8	0	31	30	0	0	0	26	7	0	110	1242
5:30 PM	0	0	0	0	5	0	17	0	19	18	0	0	0	14	6	0	79	1214
5:35 PM	0	0	0	0	6	0	16	0	27	34	0	0	0	15	8	0	106	1239
5:40 PM	0	0	0	0	10	0	15	0	23	32	0	0	0	18	4	0	102	1233
5:45 PM	0	0	0	0	14	0	11	0	13	31	0	0	0	17	7	0	93	1223
5:50 PM	0	0	0	0	5	0	20	0	19	20	0	0	0	26	3	0	93	1214
5:55 PM	0	0	0	0	9	0	13	0	15	28	0	0	0	20	9	0	94	1222

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	116	0	208	0	344	392	0	0	0	236	88	0	1384
Heavy Trucks	0	0	0		4	0	0		0	4	0		0	4	4		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

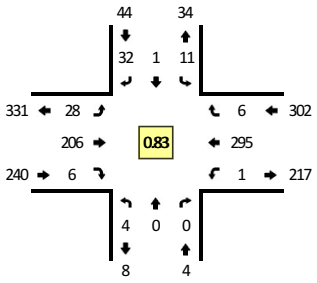
Type of peak hour being reported: Intersection Peak

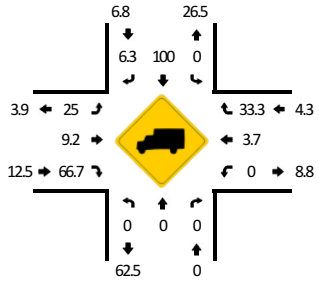
Method for determining peak hour: Total Entering Volume

LOCATION: N Hargrave St -- NE 28th St
CITY/STATE: Camas, WA

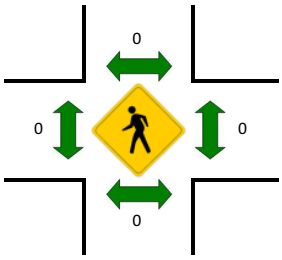
QC JOB #: 16956003
DATE: Wed, Mar 12 2025

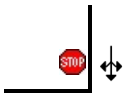
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

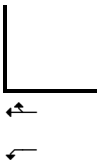


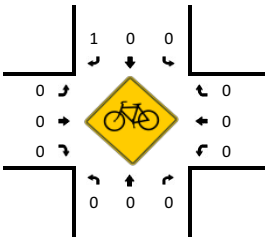


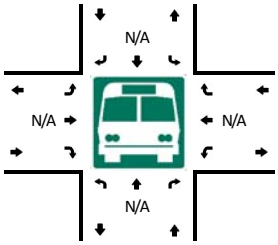
TRUE DATA TO IMPROVE MOBILITY

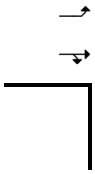


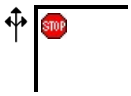


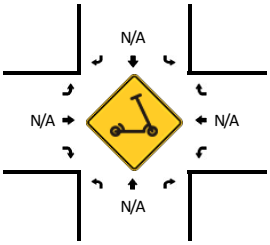












5-Min Count Period Beginning At	N Hargrave St (Northbound)				N Hargrave St (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	1	0	1	14	0	0	0	15	0	0	32	
7:05 AM	0	0	0	0	0	0	3	0	3	11	0	0	0	14	0	0	31	
7:10 AM	0	0	0	0	0	0	5	0	1	10	0	0	0	15	0	0	31	
7:15 AM	0	0	0	0	0	0	1	0	3	8	2	0	1	16	0	0	31	
7:20 AM	1	0	0	0	0	0	3	0	2	15	0	0	0	13	0	0	34	
7:25 AM	1	0	0	0	0	0	1	0	2	15	2	0	0	31	0	0	52	
7:30 AM	0	0	0	0	0	0	2	0	2	8	0	0	0	19	1	0	32	
7:35 AM	0	0	0	0	0	0	6	0	4	15	0	0	1	21	0	0	47	
7:40 AM	0	0	0	0	0	0	2	0	1	13	0	0	1	24	0	0	41	
7:45 AM	1	0	0	0	2	1	6	0	5	22	1	0	0	24	0	0	62	
7:50 AM	1	0	0	0	2	0	4	0	2	24	1	0	0	19	0	0	53	
7:55 AM	1	0	0	0	0	0	1	0	3	19	1	0	0	26	1	0	52	498
8:00 AM	0	0	0	0	3	0	1	0	3	30	1	0	1	34	0	0	73	539
8:05 AM	0	0	0	0	0	0	2	0	2	14	0	0	0	28	1	0	47	555
8:10 AM	0	0	0	0	0	0	2	0	1	21	0	0	0	25	1	0	50	574
8:15 AM	1	0	0	0	0	0	0	0	1	6	0	0	0	23	1	0	32	575
8:20 AM	0	0	0	0	1	0	2	0	2	12	1	0	0	23	0	0	41	582
8:25 AM	0	0	0	0	1	0	2	0	2	13	1	0	0	24	0	0	43	573
8:30 AM	0	0	0	0	0	0	1	0	1	13	0	0	0	13	1	0	29	570
8:35 AM	0	0	0	0	1	0	4	0	3	15	0	0	0	25	0	0	48	571
8:40 AM	0	0	0	0	1	0	7	0	3	17	0	0	0	31	1	0	60	590
8:45 AM	0	0	0	0	2	0	3	0	5	20	0	0	0	23	1	0	54	582
8:50 AM	0	0	0	0	1	0	5	0	1	16	1	0	0	15	0	0	39	568
8:55 AM	0	0	0	0	0	0	7	0	2	17	0	0	0	11	0	0	37	553

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	0	0	0	20	0	24	0	32	292	12	0	4	316	4	0	712
Heavy Trucks	0	0	0		0	0	4		8	24	8		0	12	0		56
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

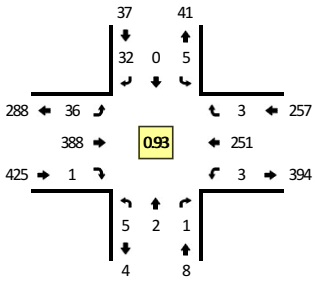
Type of peak hour being reported: Intersection Peak

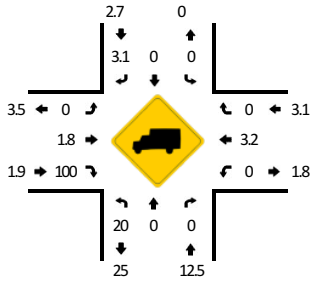
Method for determining peak hour: Total Entering Volume

LOCATION: N Hargrave St -- NE 28th St
CITY/STATE: Camas, WA

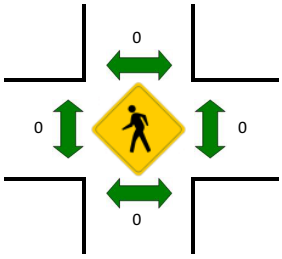
QC JOB #: 16956004
DATE: Wed, Mar 12 2025

Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

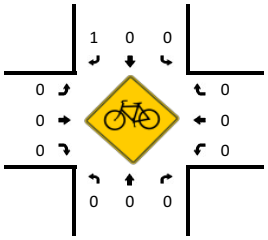


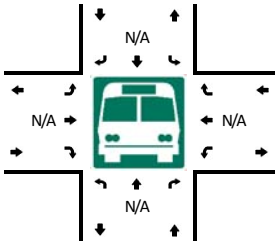


TRUE DATA TO IMPROVE MOBILITY

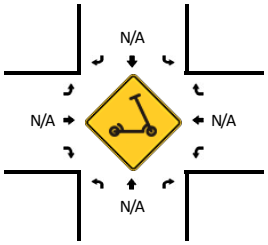












5-Min Count Period Beginning At	N Hargrave St (Northbound)				N Hargrave St (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	1	0	3	0	0	37	0	0	0	16	0	0	57	
4:05 PM	0	0	0	0	2	0	0	0	2	31	2	0	0	21	0	0	58	
4:10 PM	0	0	0	0	0	0	4	0	2	32	0	0	0	22	0	0	60	
4:15 PM	0	0	0	0	0	0	4	0	4	26	0	0	0	15	0	0	49	
4:20 PM	1	0	0	0	0	0	2	0	2	33	0	0	0	13	0	0	51	
4:25 PM	1	0	0	0	0	0	3	0	3	24	0	0	0	15	0	0	46	
4:30 PM	2	1	0	0	1	0	4	0	1	32	0	0	2	24	1	0	68	
4:35 PM	0	0	1	0	1	0	0	0	2	25	0	0	0	22	0	0	51	
4:40 PM	1	0	0	0	0	0	3	0	1	31	0	0	0	28	0	0	64	
4:45 PM	1	0	0	0	0	0	4	0	3	34	0	0	0	24	0	0	66	
4:50 PM	0	0	0	0	0	0	5	0	1	30	0	0	0	19	0	0	55	
4:55 PM	0	0	0	0	2	0	4	0	6	26	1	0	0	15	0	0	54	679
5:00 PM	0	0	0	0	0	0	0	0	3	48	0	0	0	24	0	0	75	697
5:05 PM	0	0	0	0	0	0	4	0	3	25	0	0	0	16	0	0	48	687
5:10 PM	1	1	0	0	0	0	2	0	3	28	0	0	1	13	1	0	50	677
5:15 PM	0	0	0	0	1	0	2	0	3	42	0	0	0	22	0	0	70	698
5:20 PM	0	0	0	0	0	0	2	0	7	35	0	0	0	24	0	0	68	715
5:25 PM	0	0	0	0	0	0	2	0	3	32	0	0	0	20	1	0	58	727
5:30 PM	0	0	0	0	0	0	2	0	2	18	0	0	0	19	0	0	41	700
5:35 PM	1	0	0	0	0	0	2	0	1	36	0	0	0	19	0	0	59	708
5:40 PM	1	0	0	0	0	0	4	0	2	31	0	0	1	18	1	0	58	702
5:45 PM	0	0	0	0	0	0	5	0	3	41	0	0	0	20	0	0	69	705
5:50 PM	0	0	0	0	0	0	5	0	2	24	0	0	0	22	0	0	53	703
5:55 PM	0	0	0	0	0	1	10	0	2	27	0	0	0	20	0	0	60	709

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	4	0	24	0	52	436	0	0	0	264	4	0	784
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	8	0		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

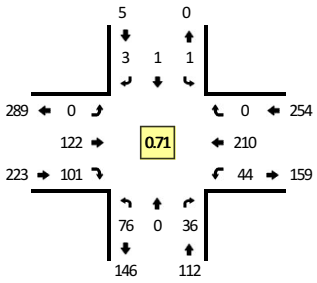
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

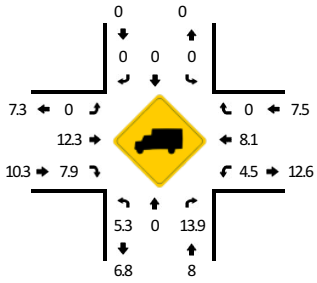
LOCATION: NE 232nd Ave -- NE 28th St
CITY/STATE: Fern Prairie, WA

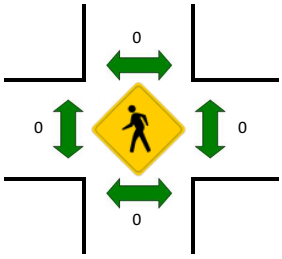
QC JOB #: 16956005
DATE: Wed, Mar 12 2025

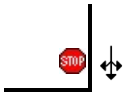
Peak-Hour: 7:45 AM -- 8:45 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

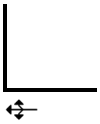


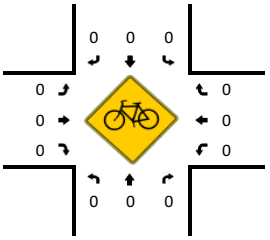


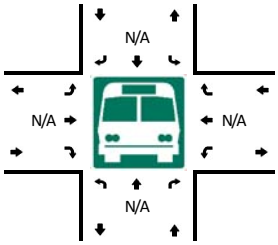


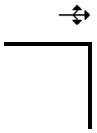


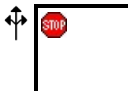


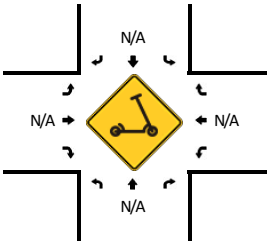












5-Min Count Period Beginning At	NE 232nd Ave (Northbound)				NE 232nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	0	0	0	0	0	0	0	0	7	9	0	1	11	2	0	32	
7:05 AM	2	0	0	0	0	0	0	0	0	6	3	0	0	9	0	0	20	
7:10 AM	3	0	2	0	0	0	0	0	0	8	0	0	1	9	1	0	24	
7:15 AM	1	0	0	0	0	0	0	0	0	5	1	0	0	12	0	0	19	
7:20 AM	2	0	0	0	0	0	0	0	0	8	3	0	2	7	0	0	22	
7:25 AM	1	0	0	0	1	0	1	0	0	7	8	0	2	29	0	0	49	
7:30 AM	5	0	0	0	0	0	0	0	0	8	0	0	1	16	0	0	30	
7:35 AM	1	0	0	0	0	0	0	0	0	2	9	0	7	18	0	0	37	
7:40 AM	2	0	0	0	0	0	0	0	0	11	5	0	6	16	0	0	40	
7:45 AM	4	0	6	0	1	0	0	0	0	9	8	0	6	15	0	0	49	
7:50 AM	4	0	4	0	0	0	0	0	0	10	20	0	18	18	0	0	74	
7:55 AM	14	0	8	0	0	0	0	0	0	15	13	0	7	12	0	0	69	465
8:00 AM	15	0	7	0	0	1	1	0	0	12	14	0	1	16	0	0	67	500
8:05 AM	9	0	6	0	0	0	0	0	0	14	9	0	0	20	0	0	58	538
8:10 AM	5	0	2	0	0	0	0	0	0	10	7	0	0	14	0	0	38	552
8:15 AM	6	0	1	0	0	0	0	0	0	4	5	0	0	18	0	0	34	567
8:20 AM	4	0	1	0	0	0	0	0	0	10	3	0	6	21	0	0	45	590
8:25 AM	1	0	0	0	0	0	0	0	0	10	5	0	3	19	0	0	38	579
8:30 AM	4	0	0	0	0	0	1	0	0	7	5	0	2	14	0	0	33	582
8:35 AM	4	0	1	0	0	0	1	0	0	9	4	0	1	17	0	0	37	582
8:40 AM	6	0	0	0	0	0	0	0	0	12	8	0	0	26	0	0	52	594
8:45 AM	2	0	3	0	0	0	0	0	0	15	5	0	0	16	0	0	41	586
8:50 AM	2	0	0	0	0	0	0	0	0	10	5	0	0	17	0	0	34	546
8:55 AM	3	0	1	0	0	0	0	0	0	11	6	0	0	13	0	0	34	511

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	132	0	76	0	0	4	4	0	0	148	188	0	104	184	0	0	840
Heavy Trucks	8	0	12		0	0	0		0	12	16		0	12	0		60
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

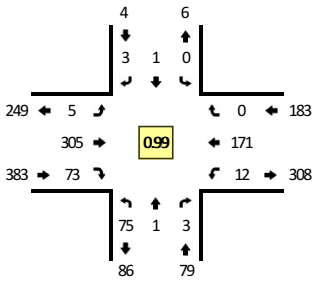
Type of peak hour being reported: Intersection Peak

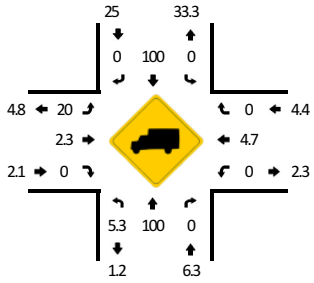
Method for determining peak hour: Total Entering Volume

LOCATION: NE 232nd Ave -- NE 28th St
CITY/STATE: Fern Prairie, WA

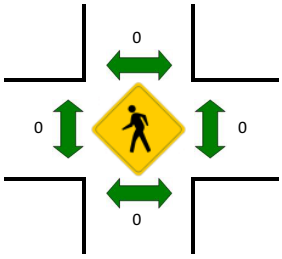
QC JOB #: 16956006
DATE: Wed, Mar 12 2025

Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 4:25 PM -- 4:40 PM

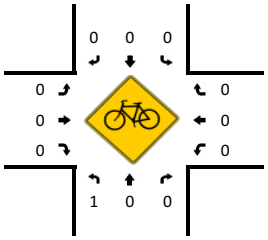


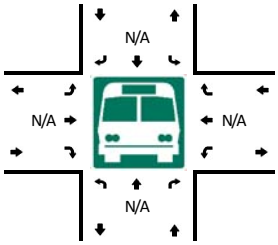


TRUE DATA TO IMPROVE MOBILITY

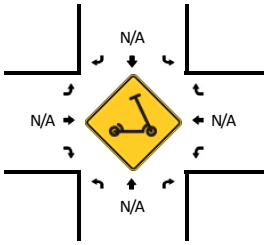












5-Min Count Period Beginning At	NE 232nd Ave (Northbound)				NE 232nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	0	1	0	0	0	0	0	0	27	8	0	1	8	0	0	50	
4:05 PM	8	0	0	0	0	0	0	0	0	30	6	0	1	14	0	0	59	
4:10 PM	8	0	0	0	0	0	0	0	1	22	7	0	1	15	0	0	54	
4:15 PM	3	0	1	0	0	0	1	0	0	20	6	0	0	13	0	0	44	
4:20 PM	1	0	0	0	0	0	0	0	0	24	6	0	0	11	0	0	42	
4:25 PM	7	1	1	0	0	0	1	0	1	27	6	0	0	9	0	0	53	
4:30 PM	8	0	1	0	0	0	0	0	0	24	7	0	0	18	0	0	58	
4:35 PM	6	0	0	0	0	0	1	0	0	24	3	0	0	19	0	0	53	
4:40 PM	5	0	0	0	0	0	1	0	0	18	6	0	1	18	0	0	49	
4:45 PM	8	0	0	0	0	0	0	0	2	27	4	0	3	17	0	0	61	
4:50 PM	4	0	0	0	0	0	0	0	0	30	3	0	2	10	0	0	49	
4:55 PM	4	0	0	0	0	0	0	0	0	20	7	0	2	13	0	0	46	618
5:00 PM	8	0	1	0	0	0	0	0	0	23	10	0	0	15	0	0	57	625
5:05 PM	6	0	0	0	0	0	0	0	1	36	3	0	0	14	0	0	60	626
5:10 PM	4	0	0	0	0	0	0	0	1	19	9	0	0	8	0	0	41	613
5:15 PM	9	0	0	0	0	1	0	0	0	31	9	0	1	12	0	0	63	632
5:20 PM	6	0	0	0	0	0	0	0	0	26	6	0	3	18	0	0	59	649
5:25 PM	6	0	1	0	0	0	0	0	0	21	8	0	0	12	0	0	48	644
5:30 PM	3	0	0	0	0	0	0	0	0	17	5	0	1	15	0	0	41	627
5:35 PM	5	0	1	0	0	0	0	0	1	30	3	0	0	13	0	0	53	627
5:40 PM	5	0	0	0	0	0	0	0	1	21	8	0	1	11	0	0	47	625
5:45 PM	6	0	0	0	0	0	1	0	0	21	12	0	2	15	0	0	57	621
5:50 PM	7	0	1	0	0	0	0	0	2	18	10	0	0	15	0	0	53	625
5:55 PM	7	0	0	0	0	0	0	0	0	25	0	0	1	11	0	0	44	623

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	84	4	8	0	0	0	8	0	4	300	64	0	0	184	0	0	656
Heavy Trucks	8	4	0		0	0	0		0	8	0		0	12	0		32
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	4	0	0		0	0	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

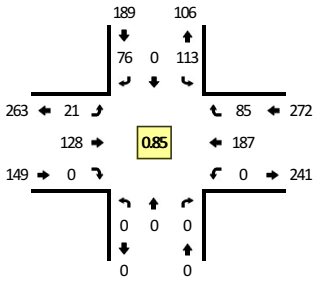
Type of peak hour being reported: Intersection Peak

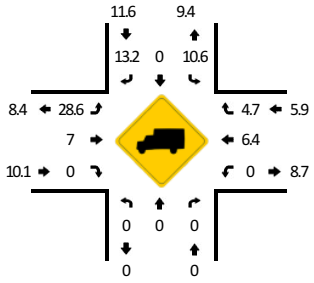
Method for determining peak hour: Total Entering Volume

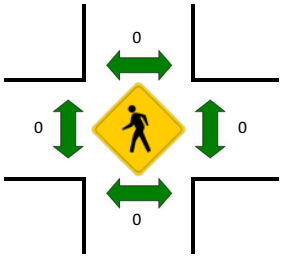
LOCATION: NE 242nd Ave -- NE 28th St
CITY/STATE: Fern Prairie, WA

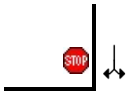
QC JOB #: 16956007
DATE: Wed, Mar 12 2025

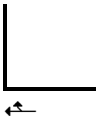
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:55 AM -- 8:10 AM

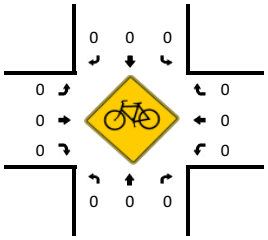


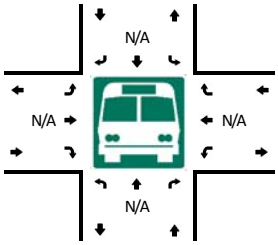


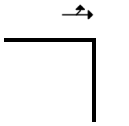




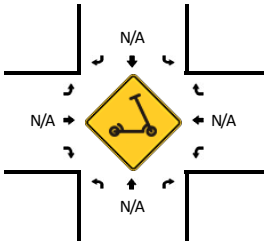












5-Min Count Period Beginning At	NE 242nd Ave (Northbound)				NE 242nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	3	0	3	4	0	0	0	10	2	0	23	
7:05 AM	0	0	0	0	4	0	3	0	0	6	0	0	0	6	6	0	25	
7:10 AM	0	0	0	0	0	0	3	0	2	8	0	0	0	10	7	0	30	
7:15 AM	0	0	0	0	4	0	5	0	1	4	0	0	0	10	10	0	34	
7:20 AM	0	0	0	0	7	0	3	0	1	7	0	0	0	9	13	0	40	
7:25 AM	0	0	0	0	8	0	8	0	1	7	0	0	0	17	7	0	48	
7:30 AM	0	0	0	0	8	0	7	0	0	8	0	0	0	13	10	0	46	
7:35 AM	0	0	0	0	9	0	5	0	1	0	0	0	0	18	4	0	37	
7:40 AM	0	0	0	0	10	0	11	0	0	13	0	0	0	15	7	0	56	
7:45 AM	0	0	0	0	4	0	10	0	2	12	0	0	0	13	6	0	47	
7:50 AM	0	0	0	0	4	0	14	0	2	14	0	0	0	21	5	0	60	
7:55 AM	0	0	0	0	15	0	6	0	3	19	0	0	0	12	8	0	63	509
8:00 AM	0	0	0	0	12	0	0	0	4	11	0	0	0	17	11	0	55	541
8:05 AM	0	0	0	0	10	0	6	0	3	21	0	0	0	16	6	0	62	578
8:10 AM	0	0	0	0	13	0	3	0	3	10	0	0	0	10	8	0	47	595
8:15 AM	0	0	0	0	12	0	2	0	1	3	0	0	0	16	7	0	41	602
8:20 AM	0	0	0	0	8	0	4	0	1	10	0	0	0	19	6	0	48	610
8:25 AM	0	0	0	0	7	0	6	0	2	5	0	0	0	15	4	0	39	601
8:30 AM	0	0	0	0	7	0	3	0	1	11	0	0	0	9	6	0	37	592
8:35 AM	0	0	0	0	6	0	3	0	3	7	0	0	0	18	10	0	47	602
8:40 AM	0	0	0	0	5	0	6	0	2	9	0	0	0	17	3	0	42	588
8:45 AM	0	0	0	0	10	0	3	0	2	12	0	0	0	16	11	0	54	595
8:50 AM	0	0	0	0	9	0	2	0	1	10	0	0	0	11	4	0	37	572
8:55 AM	0	0	0	0	8	0	3	0	1	10	0	0	0	9	4	0	35	544

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	148	0	48	0	40	204	0	0	0	180	100	0	720
Heavy Trucks	0	0	0		12	0	0		12	8	0		0	8	12		52
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/18/2025 2:00 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

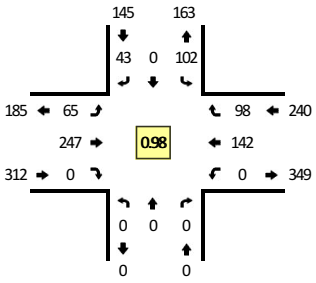
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

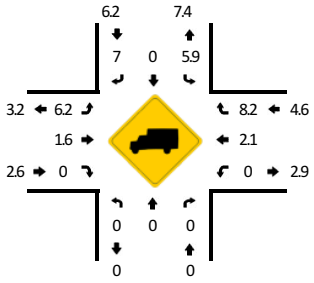
LOCATION: NE 242nd Ave -- NE 28th St
CITY/STATE: Fern Prairie, WA

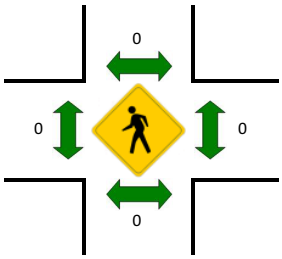
QC JOB #: 16956008
DATE: Wed, Mar 12 2025

Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

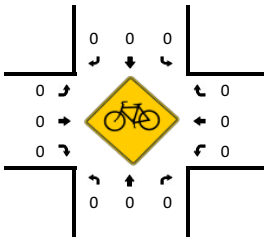


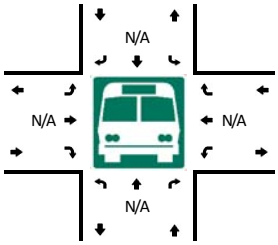




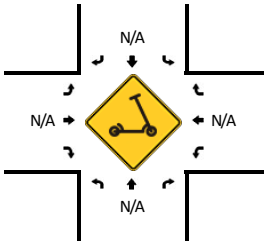












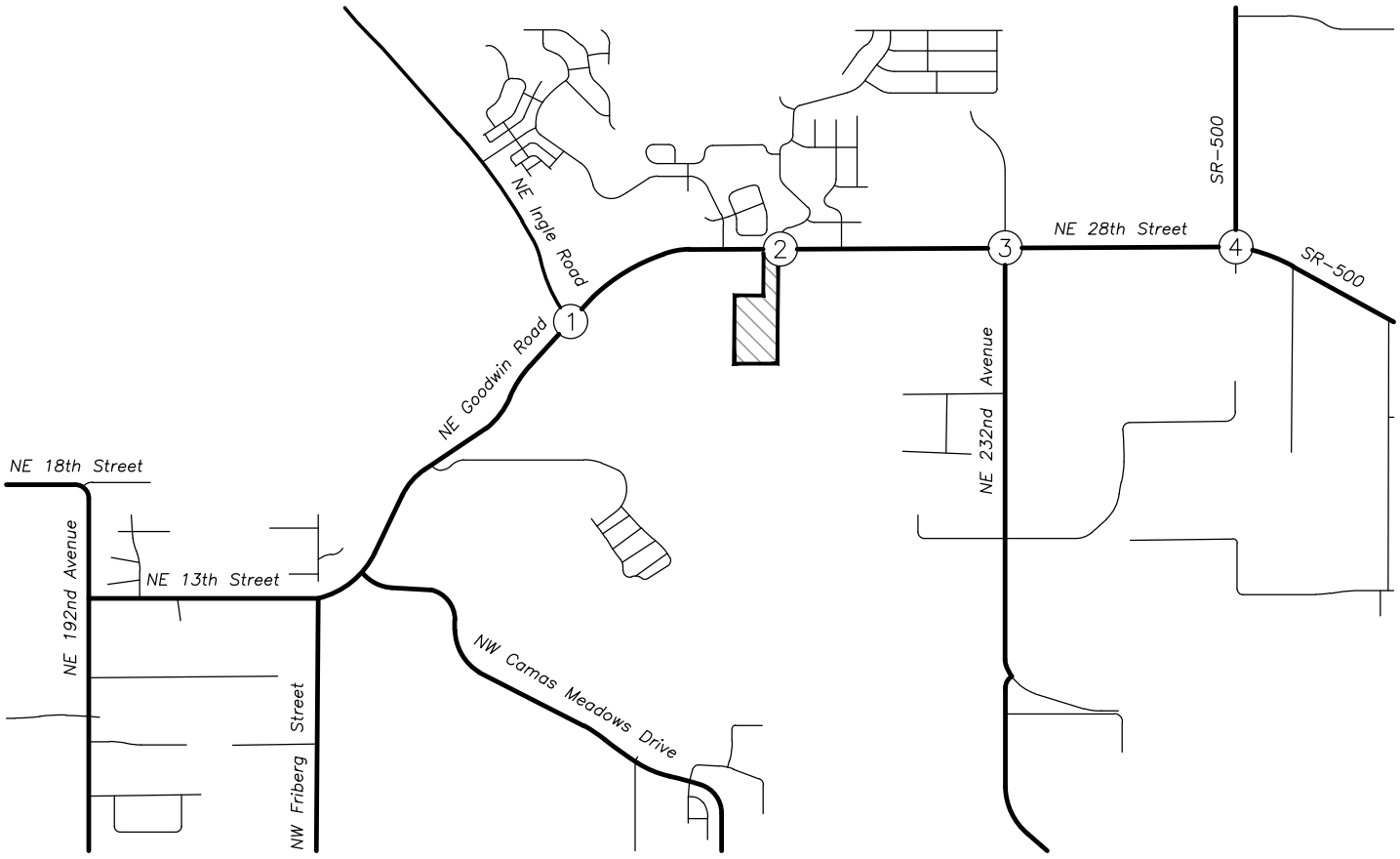
5-Min Count Period Beginning At	NE 242nd Ave (Northbound)				NE 242nd Ave (Southbound)				NE 28th St (Eastbound)				NE 28th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	9	0	1	0	5	18	0	0	0	6	8	0	47	
4:05 PM	0	0	0	0	5	0	3	0	6	29	0	0	0	12	6	0	61	
4:10 PM	0	0	0	0	9	0	6	0	6	14	0	0	0	11	11	0	57	
4:15 PM	0	0	0	0	6	0	1	0	4	19	0	0	0	10	8	0	48	
4:20 PM	0	0	0	0	6	0	3	0	4	18	0	0	0	7	9	0	47	
4:25 PM	0	0	0	0	6	0	4	0	5	26	0	0	0	8	9	0	58	
4:30 PM	0	0	0	0	9	0	5	0	5	21	0	0	0	13	9	0	62	
4:35 PM	0	0	0	0	8	0	1	0	4	17	0	0	0	17	8	0	55	
4:40 PM	0	0	0	0	8	0	8	0	6	12	0	0	0	14	9	0	57	
4:45 PM	0	0	0	0	9	0	3	0	10	19	0	0	0	13	9	0	63	
4:50 PM	0	0	0	0	5	0	2	0	8	24	0	0	0	10	6	0	55	
4:55 PM	0	0	0	0	10	0	4	0	2	13	0	0	0	10	7	0	46	656
5:00 PM	0	0	0	0	12	0	4	0	7	19	0	0	0	13	8	0	63	672
5:05 PM	0	0	0	0	11	0	2	0	10	26	0	0	0	10	7	0	66	677
5:10 PM	0	0	0	0	9	0	2	0	1	20	0	0	0	7	9	0	48	668
5:15 PM	0	0	0	0	4	0	2	0	3	26	0	0	0	13	7	0	55	675
5:20 PM	0	0	0	0	11	0	6	0	4	24	0	0	0	14	10	0	69	697
5:25 PM	0	0	0	0	10	0	5	0	5	18	0	0	0	5	8	0	51	690
5:30 PM	0	0	0	0	6	0	2	0	2	15	0	0	0	16	10	0	51	679
5:35 PM	0	0	0	0	8	0	2	0	8	20	0	0	0	11	7	0	56	680
5:40 PM	0	0	0	0	8	0	3	0	5	14	0	0	0	10	7	0	47	670
5:45 PM	0	0	0	0	11	0	3	0	4	19	0	0	0	11	10	0	58	665
5:50 PM	0	0	0	0	5	0	4	0	6	15	0	0	0	10	7	0	47	657
5:55 PM	0	0	0	0	6	0	1	0	6	16	0	0	0	12	3	0	44	655

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	128	0	32	0	72	260	0	0	0	120	96	0	708
Heavy Trucks	0	0	0		0	0	0		4	4	0		0	0	8		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

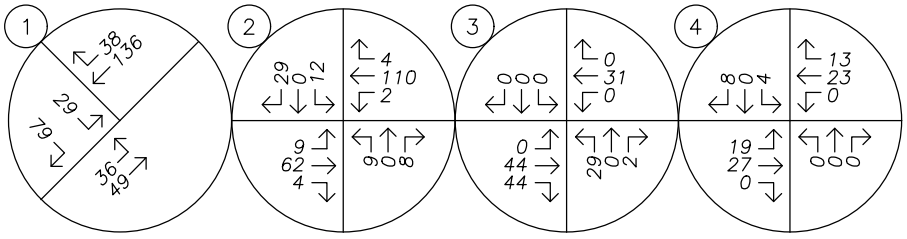
Comments:

Report generated on 3/18/2025 2:00 PM

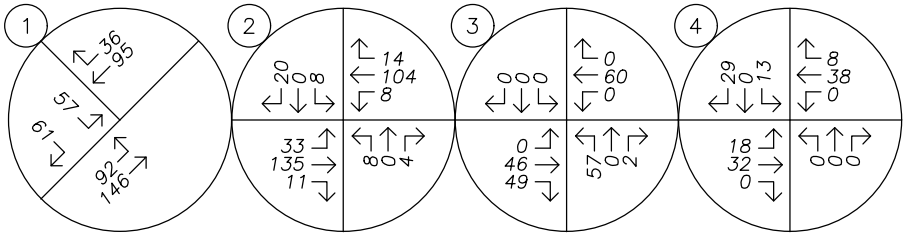
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212



AM PEAK HOUR



PM PEAK HOUR



no scale

TRAFFIC VOLUMES
In-Process Development Trips
AM & PM Peak Hours

Figure A
Landing at Green Mountain Pha 797
4/9/2025

Appendix D – Safety Analysis

Crash History Data

Preliminary Signal Warrant Analysis

Preliminary All-Way Stop-Control Warrant Analysis

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

CITY STREET INTERSECTIONS

Goodwin Rd @ Ingle Rd

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY INTERSECTING COUNTY ROAD MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY / SUSPENSE IND	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION
City Street	Clark	Camas	NE GOODWIN RD			0	NE INGLE RD						No	EA18227	02/18/2020	15:27	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight	Making Left Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	EF36498	11/01/2024	19:53	Suspected Minor Injury	1	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Dark-Street Lights On	Entering at angle	Making Right Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	EE09429	10/13/2023	13:05	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle	Making Left Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	EC98250	10/28/2022	15:07	Suspected Minor Injury	1	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car	At Intersection and Related	Raining	Wet	Daylight	Entering at angle	Making Left Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	ED96903	09/05/2023	11:15	Suspected Minor Injury	1	0	1	0	1	Passenger Car		At Intersection and Related	Clear	Dry	Daylight	Vehicle Strikes Pedalcyclist	Making Left Turn
City Street	Clark	Camas	NE GOODWIN RD			2456	NE INGLE RD						No	EB31078	05/10/2021	08:30	No Apparent Injury	0	0	2	0	0	Passenger Car	Truck (Flatbad,Van,etc)	At Intersection and Related	Clear	Dry	Daylight	Entering at angle	Making Left Turn
City Street	Clark	Camas	NE INGLE RD			2801	NE GOODWIN RD						No	EC42752	05/02/2022	17:00	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car	At Intersection and Related	Clear	Wet	Daylight	Entering at angle	Making Left Turn
City Street	Clark	Camas	NE INGLE RD			0	NE GOODWIN RD						No	E966064	09/20/2019	16:58	Possible Injury	2	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Overcast	Dry	Daylight	Entering at angle	Making Left Turn

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

CITY STREET INTERSECTIONS

Goodwin Rd @ Ingle Rd

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
Going Straight Ahead	West	North	East	West	Distractions Outside Vehicle			None									Lane of Primary Trafficway	1140563.25	118372.87
Going Straight Ahead	Northwest	Southwest	Northeast	Southwest	Did Not Grant RW to Vehicle			None									Intersecting Trafficway	1140562.72	118372.88
Going Straight Ahead	North	East	East	West	Disregard Traffic Sign and Signals			None									Lane of Primary Trafficway	1140562.72	118372.88
Going Straight Ahead	Northwest	Northeast	Northeast	Southwest	Did Not Grant RW to Vehicle			None									Lane of Primary Trafficway	1140562.72	118372.88
	South	West			Did Not Grant R/W to Non Motorist									None			Lane of Primary Trafficway	1140562.72	118372.88
Going Straight Ahead	North	East	East	West	Did Not Grant RW to Vehicle			None									Lane of Primary Trafficway	1140562.72	118372.88
Going Straight Ahead	Northwest	Northeast	Northeast	Southwest	Unknown Distraction			None									Lane of Primary Trafficway	1140562.72	118372.88
Going Straight Ahead	West	North	North	South	Did Not Grant RW to Vehicle			None									Lane of Primary Trafficway	1140563.26	118372.88

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

CITY STREET INTERSECTIONS

28th St @ Hargrave St / 22nd Ave - *No Reported Crashes*

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY INTERSECTING COUNTY ROAD MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY / SUSPENSE IND	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

CITY STREET INTERSECTIONS

28th St @ Hargrave St / 22nd Ave - *No Reported Crashes*

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

COUNTY ROAD INTERSECTIONS

28th St (Co Rd # 93350, mp 3.070 - 3.110) @ 232nd Ave (Co Rd # 30950, mp 2.870 - 2.890)

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY INTERSECTING COUNTY ROAD MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY / SUSPENSE IND	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION
County Road	Clark		30950	2.890			93350	3.090					No	EE81852	05/28/2024	14:30	No Apparent Injury	0	0	1	0	0	Truck & Trailer		At Intersection and Related	Overcast	Dry	Daylight	Utility Pole	Making Right Turn
County Road	Clark		93350	3.090			30950	2.890					No	E923671	05/23/2019	16:54	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - one left turn - one straight	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	EB42601	06/15/2021	18:31	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	Entering at angle	Making Right Turn
County Road	Clark		93350	3.090			30950	2.890					No	EA02765	12/20/2019	09:12	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	From same direction - one left turn - one straight	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	EB53840	07/20/2021	15:10	Suspected Minor Injury	3	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear	Dry	Daylight	Entering at angle	Making Left Turn
County Road	Clark		93350	3.090			30950	2.890					No	EB10619	02/28/2021	16:35	No Apparent Injury	0	0	1	0	1	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear	Dry	Daylight	Vehicle Strikes Pedalcyclist	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	EB69640	09/01/2021	11:59	No Apparent Injury	0	0	1	0	0	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear	Dry	Daylight	Utility Pole	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	EE74231	02/18/2024	15:52	Unknown	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Overcast	Unknown	Other	Entering at angle	Going Straight Ahead
County Road	Clark		93350	3.090			30950	2.890					No	ED64349	05/21/2023	16:55	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Overcast	Dry	Daylight	From same direction - one right turn - one straight	Going Straight Ahead
County Road	Clark		93350	3.090									No	EA84265	11/24/2020	15:25	Possible Injury	2	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	Driveway Related but Not at Driveway	Overcast	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

COUNTY ROAD INTERSECTIONS

28th St (Co Rd # 93350, mp 3.070 - 3.110) @ 232nd Ave (Co Rd # 30950, mp 2.870 - 2.890)

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
	West	South			None												Past the Outside Shoulder of Primary Trafficway	1145581.94	119082.99
Making Left Turn	East	West	East	South	Inattention	Follow Too Closely		None									Lane of Primary Trafficway	1145581.43	119082.29
Stopped at Signal or Stop Sign	West	South	South	West	Exceeding Reas. Safe Speed			None									Intersecting Trafficway	1145581.94	119082.99
Making Left Turn	East	West	East	South	Follow Too Closely			None									Lane of Primary Trafficway	1145581.43	119082.28
Going Straight Ahead	South	West	East	West	Did Not Grant RW to Vehicle	Unknown Distraction		None									Lane of Primary Trafficway	1145581.94	119082.99
	East	West			None									Improper Turn/Merge			Lane of Primary Trafficway	1145581.94	119082.99
	East	West			Other Contributing Circ Not Listed												Past the Outside Shoulder of Primary Trafficway	1145581.94	119082.99
Making Left Turn	West	East	South	Northwest	None			Unknown Distraction									Lane of Primary Trafficway	1145581.94	119082.99
Making Right Turn	West	East	West	South	Distracted by Adjusting Vehicle Cntrls			None									Lane of Primary Trafficway	1145581.94	119082.99
Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped	Follow Too Closely			None									Lane of Primary Trafficway	1145581.94	119082.99

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

STATE ROUTE INTERSECTIONS

SR 500 (aka 242nd Ave / Dresser Rd, mp 13.82 - 13.86) @ 28th St (Co Rd # 93350, mp 3.570 - 3.590)

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	MILEPOST	A / B	BLOCK NUMBER	INTERSECTING TRAFFICWAY	CO ONLY INTERSECTING COUNTY ROAD MP	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	SR ONLY HISTORY / SUSPENSE IND	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION
State Route	Clark		500	13.84									No	EF31345	10/28/2024	07:59	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Driveway within Major Intersection	Overcast	Wet	Daylight	From opposite direction - one left turn - one straight	Making Left Turn
State Route	Clark		500	13.84									No	E961000	09/04/2019	11:57	Possible Injury	2	0	2	0	0	Passenger Car	Truck Tractor & Semi-Trailer	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle	Going Straight Ahead
State Route	Clark		500	13.84									No	EB87073	11/06/2021	15:55	No Apparent Injury	0	0	2	0	0	Passenger Car	Passenger Car	At Driveway within Major Intersection	Raining	Wet	Daylight	Entering at angle	Starting in Traffic Lane
State Route	Clark		500	13.84									No	ED77436	07/04/2023	16:05	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle	Starting in Traffic Lane

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* MULTIPLE INTERSECTIONS IN CLARK COUNTY

STATE ROUTE INTERSECTIONS

SR 500 (aka 242nd Ave / Dresser Rd, mp 13.82 - 13.86) @ 28th St (Co Rd # 93350, mp 3.570 - 3.590)

01/01/2019 - 6/30/2024 *See 2nd tab below for road info*

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
Going Straight Ahead	North	East	South	North	Did Not Grant RW to Vehicle			None									Lane 1 Increasing Milepost	1148224.12	119052.38
Going Straight Ahead	North	South	East	West	Under Influence of Drugs			None									Lane 1 Decreasing Milepost	1148229.61	119051.46
Going Straight Ahead	North	South	East	West	Did Not Grant RW to Vehicle			None									Lane 1 Increasing Milepost	1148221.08	119048
Making Left Turn	West	East	West	North	Improper Turn/Merge			None									Lane 1 Increasing Milepost	1148221.08	119048

Traffic Signal Warrant Analysis

Project: Landing at Green Mountain Phase 2
Date: 4/3/2025
Scenario: 2027 Buildout Conditions

	Major Street:	Minor Street:
	NE 28th Street	N Hargrave Street
Number of Lanes:	1	1
PM Peak Hour Volumes:	1032	53

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	10,320	6,200	
Minor Street*	530	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	10,320	9,300	
Minor Street*	530	950	**No**
Combination Warrant			
Major Street	10,320	7,440	
Minor Street*	530	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

Project: Landing at Green Mountain Phase 2
Date: 4/3/2025
Scenario: 2027 Buildout Conditions

	Major Street:	Minor Street:
	NE 28th Street	NE 232nd Avenue
Number of Lanes:	1	1
PM Peak Hour Volumes:	750	142

Warrant Used:

_____	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	7,500	6,200	
Minor Street*	1,420	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	7,500	9,300	
Minor Street*	1,420	950	**No**
Combination Warrant			
Major Street	7,500	7,440	
Minor Street*	1,420	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Traffic Signal Warrant Analysis

Project: Landing at Green Mountain Phase 2
Date: 4/3/2025
Scenario: 2027 Buildout Conditions

Major Street:	NE 28th Street/SR-500	Minor Street:	SR-500 (North Leg)
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	537	PM Peak Hour Volumes:	214

Warrant Used:

_____ 100 percent of standard warrants used
X 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	5,370	6,200	
Minor Street*	2,140	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	5,370	9,300	
Minor Street*	2,140	950	**No**
Combination Warrant			
Major Street	5,370	7,440	
Minor Street*	2,140	1,480	**No**

* Minor street right-turning traffic volumes reduced by 25%

Multi-Way Stop Warrant Analysis

Project: Landing at Green Mountain Phase 2
Date: 4/3/2025
Scenario: 2027 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	N Hargrave Street
PM Peak Hour Volumes:	1032	PM Peak Hour Volumes:	98

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	10,320	3,717	
Minor Street	980	2,478	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Multi-Way Stop Warrant Analysis

Project: Landing at Green Mountain Phase 2
Date: 4/3/2025
Scenario: 2027 Buildout Conditions

Major Street:	NE 28th Street	Minor Street:	NE 232nd Avenue
PM Peak Hour Volumes:	750	PM Peak Hour Volumes:	148

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	7,500	3,717	
Minor Street	1,480	2,478	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Multi-Way Stop Warrant Analysis

Project: Landing at Green Mountain Phase 2
Date: 4/3/2025
Scenario: 2027 Buildout Conditions

Major Street:	NE 28th Street/SR-500	Minor Street:	SR-500 (North Leg)
PM Peak Hour Volumes:	537	PM Peak Hour Volumes:	241

Warrant Used:

	100 percent of standard warrants used
X	70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph.

ADT on Major St. (total of both approaches)		ADT on Minor St. (total of both approaches)	
100% Warrants	70% Warrants	100% Warrants	70% Warrants
5,310	3,717	3,540	2,478

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Multi-Way Stop Warrant Met?
Section 2B.07.C			
Major Street	5,370	3,717	
Minor Street	2,410	2,478	**No**

Note: Minor Street includes the total of vehicular, pedestrian, and bicycle traffic.

Appendix E – Operation Analysis

Level of Service Descriptions

Synchro Capacity Reports

SimTraffic Queuing Reports

LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

Level of service A: Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

Level of service B: Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

Level of service C: Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

Level of service D: Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

Level of service E: Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

Level of service F: Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	96	382	124	145	307	57
Future Volume (veh/h)	96	382	124	145	307	57
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1856	1856
Adj Flow Rate, veh/h	105	94	136	159	337	20
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	7	7	7	7	3	3
Cap, veh/h	236	210	565	991	522	442
Arrive On Green	0.14	0.14	0.11	0.55	0.28	0.28
Sat Flow, veh/h	1711	1522	1711	1796	1856	1572
Grp Volume(v), veh/h	105	94	136	159	337	20
Grp Sat Flow(s),veh/h/ln	1711	1522	1711	1796	1856	1572
Q Serve(g_s), s	1.6	1.6	1.3	1.3	4.6	0.3
Cycle Q Clear(g_c), s	1.6	1.6	1.3	1.3	4.6	0.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	236	210	565	991	522	442
V/C Ratio(X)	0.45	0.45	0.24	0.16	0.65	0.05
Avail Cap(c_a), veh/h	1211	1077	752	1891	1249	1058
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	11.5	5.4	3.2	9.1	7.6
Incr Delay (d2), s/veh	1.3	1.5	0.2	0.1	1.3	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	1.5	0.2	0.1	1.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	12.8	13.0	5.6	3.3	10.5	7.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	199			295	357	
Approach Delay, s/veh	12.9			4.3	10.3	
Approach LOS	B			A	B	

Timer - Assigned Phs		4		6	7	8
Phs Duration (G+Y+Rc), s		20.5		8.5	7.8	12.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		30.5		20.5	6.5	19.5
Max Q Clear Time (g_c+I1), s		3.3		3.6	3.3	6.6
Green Ext Time (p_c), s		0.8		0.5	0.1	1.5

Intersection Summary	
HCM 7th Control Delay, s/veh	8.8
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	206	6	1	295	6	4	0	0	11	1	32
Future Vol, veh/h	28	206	6	1	295	6	4	0	0	11	1	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	13	13	13	4	4	4	0	0	0	7	7	7
Mvmt Flow	34	248	7	1	355	7	5	0	0	13	1	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	363	0	0	255	0	0	678	684	252	677	684	359
Stage 1	-	-	-	-	-	-	319	319	-	361	361	-
Stage 2	-	-	-	-	-	-	358	365	-	316	323	-
Critical Hdwy	4.23	-	-	4.14	-	-	7.1	6.5	6.2	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.17	5.57	-
Follow-up Hdwy	2.317	-	-	2.236	-	-	3.5	4	3.3	3.563	4.063	3.363
Pot Cap-1 Maneuver	1138	-	-	1298	-	-	369	374	792	360	365	674
Stage 1	-	-	-	-	-	-	697	656	-	647	617	-
Stage 2	-	-	-	-	-	-	664	627	-	685	642	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1138	-	-	1298	-	-	336	362	792	349	354	674
Mov Cap-2 Maneuver	-	-	-	-	-	-	502	502	-	525	503	-
Stage 1	-	-	-	-	-	-	676	637	-	646	616	-
Stage 2	-	-	-	-	-	-	624	626	-	665	623	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.96	0.03	12.24	11.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	502	1138	-	-	1298	-	-	625
HCM Lane V/C Ratio	0.01	0.03	-	-	0.001	-	-	0.085
HCM Ctrl Dly (s/v)	12.2	8.3	-	-	7.8	-	-	11.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	122	101	44	210	0	76	0	36	1	1	3
Future Vol, veh/h	0	122	101	44	210	0	76	0	36	1	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	10	10	10	8	8	8	8	8	8	0	0	0
Mvmt Flow	0	172	142	62	296	0	107	0	51	1	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	296	0	0	314	0	0	663	663	243	592	734	296
Stage 1	-	-	-	-	-	-	243	243	-	420	420	-
Stage 2	-	-	-	-	-	-	420	420	-	172	314	-
Critical Hdwy	4.2	-	-	4.18	-	-	7.18	6.58	6.28	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.272	-	-	3.572	4.072	3.372	3.5	4	3.3
Pot Cap-1 Maneuver	1221	-	-	1213	-	-	366	374	781	421	350	748
Stage 1	-	-	-	-	-	-	747	694	-	615	593	-
Stage 2	-	-	-	-	-	-	599	579	-	835	660	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1221	-	-	1213	-	-	341	351	781	370	328	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	341	351	-	370	328	-
Stage 1	-	-	-	-	-	-	747	694	-	578	557	-
Stage 2	-	-	-	-	-	-	558	544	-	781	660	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.41	18.84	12.12
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	416	1221	-	-	312	-	-	512
HCM Lane V/C Ratio	0.379	-	-	-	0.051	-	-	0.014
HCM Ctrl Dly (s/v)	18.8	0	-	-	8.1	0	-	12.1
HCM Lane LOS	C	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	1.7	0	-	-	0.2	-	-	0

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	65	247	0	0	142	98	0	0	0	102	0	48
Future Vol, veh/h	65	247	0	0	142	98	0	0	0	102	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	3	3	3	5	5	5	0	0	0	6	6	6
Mvmt Flow	66	252	0	0	145	100	0	0	0	104	0	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	245	0	0	252	0	0	530	630	252	580	580	195
Stage 1	-	-	-	-	-	-	385	385	-	195	195	-
Stage 2	-	-	-	-	-	-	145	245	-	385	385	-
Critical Hdwy	4.13	-	-	4.15	-	-	7.1	6.5	6.2	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Follow-up Hdwy	2.227	-	-	2.245	-	-	3.5	4	3.3	3.554	4.054	3.354
Pot Cap-1 Maneuver	1315	-	-	1296	-	-	463	401	792	420	421	836
Stage 1	-	-	-	-	-	-	642	614	-	798	732	-
Stage 2	-	-	-	-	-	-	863	707	-	630	604	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1315	-	-	1296	-	-	410	378	792	395	396	836
Mov Cap-2 Maneuver	-	-	-	-	-	-	410	378	-	395	396	-
Stage 1	-	-	-	-	-	-	605	578	-	798	732	-
Stage 2	-	-	-	-	-	-	812	707	-	593	569	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.64	0	0	16.12
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	375	-	-	1296	-	-	476
HCM Lane V/C Ratio	-	0.05	-	-	-	-	-	0.322
HCM Ctrl Dly (s/v)	0	7.9	0	-	0	-	-	16.1
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	1.4

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	84	182	277	377	241	81
Future Volume (veh/h)	84	182	277	377	241	81
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1856	1856
Adj Flow Rate, veh/h	93	29	308	419	268	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	3	3
Cap, veh/h	194	172	688	1074	445	369
Arrive On Green	0.11	0.11	0.18	0.57	0.24	0.24
Sat Flow, veh/h	1781	1585	1781	1870	1856	1539
Grp Volume(v), veh/h	93	29	308	419	268	26
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1856	1539
Q Serve(g_s), s	1.4	0.5	3.1	3.5	3.6	0.4
Cycle Q Clear(g_c), s	1.4	0.5	3.1	3.5	3.6	0.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	194	172	688	1074	445	369
V/C Ratio(X)	0.48	0.17	0.45	0.39	0.60	0.07
Avail Cap(c_a), veh/h	1129	1004	1033	2173	1176	975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	11.5	5.3	3.3	9.6	8.4
Incr Delay (d2), s/veh	1.8	0.5	0.5	0.2	1.3	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.3	0.1	1.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	13.7	11.9	5.8	3.5	10.9	8.4
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	122			727	294	
Approach Delay, s/veh	13.3			4.5	10.7	
Approach LOS	B			A	B	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			20.8		7.6	9.5	11.3
Change Period (Y+Rc), s			4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s			33.0		18.0	10.5	18.0
Max Q Clear Time (g_c+I1), s			5.5		3.4	5.1	5.6
Green Ext Time (p_c), s			2.5		0.2	0.4	1.2

Intersection Summary	
HCM 7th Control Delay, s/veh	7.0
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	388	1	3	251	3	5	2	1	5	0	32
Future Vol, veh/h	36	388	1	3	251	3	5	2	1	5	0	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	3	3	3	13	13	13	3	3	3
Mvmt Flow	39	417	1	3	270	3	5	2	1	5	0	34

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	273	0	0	418	0	0	772	775	418	774	774	272
Stage 1	-	-	-	-	-	-	495	495	-	278	278	-
Stage 2	-	-	-	-	-	-	276	280	-	496	496	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.23	6.63	6.33	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.23	5.63	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.23	5.63	-	6.13	5.53	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.617	4.117	3.417	3.527	4.027	3.327
Pot Cap-1 Maneuver	1290	-	-	1135	-	-	304	316	612	315	328	765
Stage 1	-	-	-	-	-	-	536	528	-	726	679	-
Stage 2	-	-	-	-	-	-	707	660	-	554	544	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1290	-	-	1135	-	-	281	306	612	302	318	765
Mov Cap-2 Maneuver	-	-	-	-	-	-	445	446	-	469	464	-
Stage 1	-	-	-	-	-	-	520	512	-	724	677	-
Stage 2	-	-	-	-	-	-	673	658	-	534	528	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.67	0.1	12.96	10.41
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	461	1290	-	-	1135	-	-	705
HCM Lane V/C Ratio	0.019	0.03	-	-	0.003	-	-	0.056
HCM Ctrl Dly (s/v)	13	7.9	-	-	8.2	-	-	10.4
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	305	73	12	171	0	75	1	3	0	1	3
Future Vol, veh/h	5	305	73	12	171	0	75	1	3	0	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	4	4	4	6	6	6	25	25	25
Mvmt Flow	5	308	74	12	173	0	76	1	3	0	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	173	0	0	382	0	0	553	552	345	516	589	173
Stage 1	-	-	-	-	-	-	355	355	-	197	197	-
Stage 2	-	-	-	-	-	-	197	197	-	319	392	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.16	6.56	6.26	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Follow-up Hdwy	2.218	-	-	2.236	-	-	3.554	4.054	3.354	3.725	4.225	3.525
Pot Cap-1 Maneuver	1404	-	-	1166	-	-	438	436	689	435	391	815
Stage 1	-	-	-	-	-	-	654	623	-	755	697	-
Stage 2	-	-	-	-	-	-	795	730	-	647	568	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1404	-	-	1166	-	-	428	429	689	425	385	815
Mov Cap-2 Maneuver	-	-	-	-	-	-	428	429	-	425	385	-
Stage 1	-	-	-	-	-	-	651	620	-	746	689	-
Stage 2	-	-	-	-	-	-	782	722	-	640	566	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.1	0.53	15.14	10.69
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	434	23	-	-	118	-	-	637
HCM Lane V/C Ratio	0.184	0.004	-	-	0.01	-	-	0.006
HCM Ctrl Dly (s/v)	15.1	7.6	0	-	8.1	0	-	10.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	21	128	0	0	187	85	0	0	0	113	0	76
Future Vol, veh/h	21	128	0	0	187	85	0	0	0	113	0	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	10	10	10	6	6	6	0	0	0	12	12	12
Mvmt Flow	25	151	0	0	220	100	0	0	0	133	0	89

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	320	0	0	151	0	0	420	520	151	470	470	270
Stage 1	-	-	-	-	-	-	200	200	-	270	270	-
Stage 2	-	-	-	-	-	-	220	320	-	200	200	-
Critical Hdwy	4.2	-	-	4.16	-	-	7.1	6.5	6.2	7.22	6.62	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Follow-up Hdwy	2.29	-	-	2.254	-	-	3.5	4	3.3	3.608	4.108	3.408
Pot Cap-1 Maneuver	1196	-	-	1406	-	-	547	463	901	487	477	745
Stage 1	-	-	-	-	-	-	806	739	-	714	668	-
Stage 2	-	-	-	-	-	-	787	656	-	779	717	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1196	-	-	1406	-	-	471	453	901	476	466	745
Mov Cap-2 Maneuver	-	-	-	-	-	-	471	453	-	476	466	-
Stage 1	-	-	-	-	-	-	788	723	-	714	668	-
Stage 2	-	-	-	-	-	-	693	656	-	762	701	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.14	0	0	15.68
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	254	-	-	1406	-	-	557
HCM Lane V/C Ratio	-	0.021	-	-	-	-	-	0.399
HCM Ctrl Dly (s/v)	0	8.1	0	-	0	-	-	15.7
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	1.9

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	129	476	165	200	455	97
Future Volume (veh/h)	129	476	165	200	455	97
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1856	1856
Adj Flow Rate, veh/h	142	235	181	220	500	45
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	7	7	7	7	3	3
Cap, veh/h	365	325	447	1011	637	540
Arrive On Green	0.21	0.21	0.11	0.56	0.34	0.34
Sat Flow, veh/h	1711	1522	1711	1796	1856	1572
Grp Volume(v), veh/h	142	235	181	220	500	45
Grp Sat Flow(s),veh/h/ln	1711	1522	1711	1796	1856	1572
Q Serve(g_s), s	2.9	5.8	2.4	2.5	9.7	0.8
Cycle Q Clear(g_c), s	2.9	5.8	2.4	2.5	9.7	0.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	365	325	447	1011	637	540
V/C Ratio(X)	0.39	0.72	0.41	0.22	0.79	0.08
Avail Cap(c_a), veh/h	829	738	539	1406	945	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	14.7	7.8	4.4	11.9	8.9
Incr Delay (d2), s/veh	0.7	3.0	0.6	0.1	2.6	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.5	0.4	3.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	14.2	17.8	8.4	4.5	14.5	9.0
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	377			401	545	
Approach Delay, s/veh	16.4			6.3	14.1	
Approach LOS	B			A	B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	27.1	13.1	8.8	18.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.5	19.5	6.5	20.5
Max Q Clear Time (g_c+I1), s	4.5	7.8	4.4	11.7
Green Ext Time (p_c), s	1.2	0.9	0.1	2.1

Intersection Summary	
HCM 7th Control Delay, s/veh	12.4
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	276	10	3	417	10	13	0	8	23	1	62
Future Vol, veh/h	38	276	10	3	417	10	13	0	8	23	1	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	13	13	13	4	4	4	0	0	0	7	7	7
Mvmt Flow	46	333	12	4	502	12	16	0	10	28	1	75

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	514	0	0	345	0	0	940	952	339	940	952	508
Stage 1	-	-	-	-	-	-	430	430	-	516	516	-
Stage 2	-	-	-	-	-	-	510	522	-	424	436	-
Critical Hdwy	4.23	-	-	4.14	-	-	7.1	6.5	6.2	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.17	5.57	-
Follow-up Hdwy	2.317	-	-	2.236	-	-	3.5	4	3.3	3.563	4.063	3.363
Pot Cap-1 Maneuver	997	-	-	1203	-	-	246	262	708	239	254	555
Stage 1	-	-	-	-	-	-	607	587	-	533	526	-
Stage 2	-	-	-	-	-	-	550	534	-	598	571	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	997	-	-	1203	-	-	202	249	708	224	242	555
Mov Cap-2 Maneuver	-	-	-	-	-	-	366	406	-	415	414	-
Stage 1	-	-	-	-	-	-	579	560	-	531	525	-
Stage 2	-	-	-	-	-	-	473	533	-	563	545	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.03	0.06	13.5	13.91
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	449	997	-	-	1203	-	-	507
HCM Lane V/C Ratio	0.056	0.046	-	-	0.003	-	-	0.204
HCM Ctrl Dly (s/v)	13.5	8.8	-	-	8	-	-	13.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0	-	-	0.8

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	171	149	46	249	0	108	0	39	1	1	3
Future Vol, veh/h	0	171	149	46	249	0	108	0	39	1	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	10	10	10	8	8	8	8	8	8	0	0	0
Mvmt Flow	0	241	210	65	351	0	152	0	55	1	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	351	0	0	451	0	0	827	826	346	721	931	351
Stage 1	-	-	-	-	-	-	346	346	-	480	480	-
Stage 2	-	-	-	-	-	-	481	480	-	241	451	-
Critical Hdwy	4.2	-	-	4.18	-	-	7.18	6.58	6.28	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.272	-	-	3.572	4.072	3.372	3.5	4	3.3
Pot Cap-1 Maneuver	1165	-	-	1079	-	-	284	301	684	345	269	697
Stage 1	-	-	-	-	-	-	658	625	-	571	558	-
Stage 2	-	-	-	-	-	-	555	544	-	767	575	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1165	-	-	1079	-	-	260	278	684	294	249	697
Mov Cap-2 Maneuver	-	-	-	-	-	-	260	278	-	294	249	-
Stage 1	-	-	-	-	-	-	658	625	-	528	516	-
Stage 2	-	-	-	-	-	-	509	504	-	705	575	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.33	36.89	13.58
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	311	1165	-	-	281	-	-	426
HCM Lane V/C Ratio	0.666	-	-	-	0.06	-	-	0.017
HCM Ctrl Dly (s/v)	36.9	0	-	-	8.6	0	-	13.6
HCM Lane LOS	E	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	4.5	0	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	87	284	0	0	171	115	0	0	0	110	0	58
Future Vol, veh/h	87	284	0	0	171	115	0	0	0	110	0	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	3	3	3	5	5	5	0	0	0	6	6	6
Mvmt Flow	89	290	0	0	174	117	0	0	0	112	0	59

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	290	0	0	642	759	290	701	701	233
Stage 1	-	-	-	-	-	-	467	467	-	233	233	-
Stage 2	-	-	-	-	-	-	174	292	-	467	467	-
Critical Hdwy	4.13	-	-	4.15	-	-	7.1	6.5	6.2	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Follow-up Hdwy	2.227	-	-	2.245	-	-	3.5	4	3.3	3.554	4.054	3.354
Pot Cap-1 Maneuver	1264	-	-	1255	-	-	390	338	754	348	358	796
Stage 1	-	-	-	-	-	-	580	565	-	761	704	-
Stage 2	-	-	-	-	-	-	832	675	-	568	555	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1264	-	-	1255	-	-	331	310	754	319	328	796
Mov Cap-2 Maneuver	-	-	-	-	-	-	331	310	-	319	328	-
Stage 1	-	-	-	-	-	-	531	518	-	761	704	-
Stage 2	-	-	-	-	-	-	770	675	-	521	508	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.89	0	0	20.42
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	422	-	-	1255	-	-	402
HCM Lane V/C Ratio	-	0.07	-	-	-	-	-	0.426
HCM Ctrl Dly (s/v)	0	8.1	0	-	0	-	-	20.4
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	2.1

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	144	250	380	538	346	120
Future Volume (veh/h)	144	250	380	538	346	120
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1856	1856
Adj Flow Rate, veh/h	160	57	422	598	384	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	3	3
Cap, veh/h	243	216	661	1151	528	438
Arrive On Green	0.14	0.14	0.21	0.62	0.28	0.28
Sat Flow, veh/h	1781	1585	1781	1870	1856	1539
Grp Volume(v), veh/h	160	57	422	598	384	40
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1856	1539
Q Serve(g_s), s	3.1	1.2	5.1	6.5	6.8	0.7
Cycle Q Clear(g_c), s	3.1	1.2	5.1	6.5	6.8	0.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	243	216	661	1151	528	438
V/C Ratio(X)	0.66	0.26	0.64	0.52	0.73	0.09
Avail Cap(c_a), veh/h	885	788	810	1704	922	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.8	14.0	6.6	3.9	11.7	9.5
Incr Delay (d2), s/veh	3.0	0.6	1.2	0.4	1.9	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.9	0.6	2.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	17.9	14.7	7.8	4.3	13.6	9.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	217			1020	424	
Approach Delay, s/veh	17.0			5.7	13.2	
Approach LOS	B			A	B	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			26.8		9.4	12.0	14.8
Change Period (Y+Rc), s			4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s			33.0		18.0	10.5	18.0
Max Q Clear Time (g_c+I1), s			8.5		5.1	7.1	8.8
Green Ext Time (p_c), s			3.8		0.5	0.5	1.6

Intersection Summary	
HCM 7th Control Delay, s/veh	9.1
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	70	539	12	11	365	17	13	2	5	13	0	53
Future Vol, veh/h	70	539	12	11	365	17	13	2	5	13	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	3	3	3	13	13	13	3	3	3
Mvmt Flow	75	580	13	12	392	18	14	2	5	14	0	57

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	411	0	0	592	0	0	1153	1171	586	1156	1168	402
Stage 1	-	-	-	-	-	-	737	737	-	425	425	-
Stage 2	-	-	-	-	-	-	416	434	-	731	743	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.23	6.63	6.33	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.23	5.63	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.23	5.63	-	6.13	5.53	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.617	4.117	3.417	3.527	4.027	3.327
Pot Cap-1 Maneuver	1148	-	-	978	-	-	166	184	490	173	192	646
Stage 1	-	-	-	-	-	-	394	409	-	605	585	-
Stage 2	-	-	-	-	-	-	593	562	-	412	420	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1148	-	-	978	-	-	140	170	490	157	178	646
Mov Cap-2 Maneuver	-	-	-	-	-	-	299	319	-	321	333	-
Stage 1	-	-	-	-	-	-	368	382	-	598	577	-
Stage 2	-	-	-	-	-	-	534	556	-	378	393	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.94	0.24	16.52	12.69
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	334	1148	-	-	978	-	-	539
HCM Lane V/C Ratio	0.064	0.066	-	-	0.012	-	-	0.132
HCM Ctrl Dly (s/v)	16.5	8.4	-	-	8.7	-	-	12.7
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-	-	0.5

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	363	125	12	238	0	135	1	5	0	1	3
Future Vol, veh/h	5	363	125	12	238	0	135	1	5	0	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	4	4	4	6	6	6	25	25	25
Mvmt Flow	5	367	126	12	240	0	136	1	5	0	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	240	0	0	493	0	0	705	705	430	642	768	240
Stage 1	-	-	-	-	-	-	440	440	-	265	265	-
Stage 2	-	-	-	-	-	-	265	265	-	377	503	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.16	6.56	6.26	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Follow-up Hdwy	2.218	-	-	2.236	-	-	3.554	4.054	3.354	3.725	4.225	3.525
Pot Cap-1 Maneuver	1326	-	-	1060	-	-	346	356	617	357	306	745
Stage 1	-	-	-	-	-	-	588	571	-	693	650	-
Stage 2	-	-	-	-	-	-	731	682	-	600	505	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1326	-	-	1060	-	-	337	350	617	346	301	745
Mov Cap-2 Maneuver	-	-	-	-	-	-	337	350	-	346	301	-
Stage 1	-	-	-	-	-	-	585	568	-	684	641	-
Stage 2	-	-	-	-	-	-	718	673	-	591	502	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.08	0.4	22.78	11.67
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	343	17	-	-	86	-	-	544
HCM Lane V/C Ratio	0.416	0.004	-	-	0.011	-	-	0.007
HCM Ctrl Dly (s/v)	22.8	7.7	0	-	8.4	0	-	11.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	40	165	0	0	233	96	0	0	0	131	0	108
Future Vol, veh/h	40	165	0	0	233	96	0	0	0	131	0	108
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	10	10	10	6	6	6	0	0	0	12	12	12
Mvmt Flow	47	194	0	0	274	113	0	0	0	154	0	127

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	387	0	0	194	0	0	562	675	194	619	619	331
Stage 1	-	-	-	-	-	-	288	288	-	331	331	-
Stage 2	-	-	-	-	-	-	274	387	-	288	288	-
Critical Hdwy	4.2	-	-	4.16	-	-	7.1	6.5	6.2	7.22	6.62	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Follow-up Hdwy	2.29	-	-	2.254	-	-	3.5	4	3.3	3.608	4.108	3.408
Pot Cap-1 Maneuver	1129	-	-	1355	-	-	440	378	852	387	392	689
Stage 1	-	-	-	-	-	-	724	677	-	662	628	-
Stage 2	-	-	-	-	-	-	736	613	-	698	656	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1129	-	-	1355	-	-	342	360	852	369	373	689
Mov Cap-2 Maneuver	-	-	-	-	-	-	342	360	-	369	373	-
Stage 1	-	-	-	-	-	-	690	646	-	662	628	-
Stage 2	-	-	-	-	-	-	600	613	-	666	625	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.62	0	0	23.71
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	351	-	-	1355	-	-	467
HCM Lane V/C Ratio	-	0.042	-	-	-	-	-	0.602
HCM Ctrl Dly (s/v)	0	8.3	0	-	0	-	-	23.7
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	3.9

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	130	476	165	203	462	100
Future Volume (veh/h)	130	476	165	203	462	100
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1856	1856
Adj Flow Rate, veh/h	143	238	181	223	508	47
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	7	7	7	7	3	3
Cap, veh/h	367	327	442	1014	644	546
Arrive On Green	0.21	0.21	0.11	0.56	0.35	0.35
Sat Flow, veh/h	1711	1522	1711	1796	1856	1572
Grp Volume(v), veh/h	143	238	181	223	508	47
Grp Sat Flow(s),veh/h/ln	1711	1522	1711	1796	1856	1572
Q Serve(g_s), s	2.9	5.9	2.4	2.5	10.0	0.8
Cycle Q Clear(g_c), s	2.9	5.9	2.4	2.5	10.0	0.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	367	327	442	1014	644	546
V/C Ratio(X)	0.39	0.73	0.41	0.22	0.79	0.09
Avail Cap(c_a), veh/h	802	714	532	1406	952	807
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.7	14.9	7.9	4.4	12.0	9.0
Incr Delay (d2), s/veh	0.7	3.1	0.6	0.1	2.7	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.5	0.4	3.3	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	14.4	18.0	8.5	4.5	14.7	9.0
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	381			404	555	
Approach Delay, s/veh	16.6			6.3	14.2	
Approach LOS	B			A	B	

Timer - Assigned Phs	4	6	7	8
Phs Duration (G+Y+Rc), s	27.5	13.2	8.9	18.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	31.9	19.1	6.5	20.9
Max Q Clear Time (g_c+I1), s	4.5	7.9	4.4	12.0
Green Ext Time (p_c), s	1.2	0.9	0.1	2.1

Intersection Summary	
HCM 7th Control Delay, s/veh	12.5
HCM 7th LOS	B

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	276	14	5	417	10	23	0	13	23	1	62
Future Vol, veh/h	38	276	14	5	417	10	23	0	13	23	1	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	13	13	13	4	4	4	0	0	0	7	7	7
Mvmt Flow	46	333	17	6	502	12	28	0	16	28	1	75

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	514	0	0	349	0	0	948	959	341	945	961	508
Stage 1	-	-	-	-	-	-	433	433	-	520	520	-
Stage 2	-	-	-	-	-	-	515	527	-	424	441	-
Critical Hdwy	4.23	-	-	4.14	-	-	7.1	6.5	6.2	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.17	5.57	-
Follow-up Hdwy	2.317	-	-	2.236	-	-	3.5	4	3.3	3.563	4.063	3.363
Pot Cap-1 Maneuver	997	-	-	1198	-	-	243	259	706	237	251	555
Stage 1	-	-	-	-	-	-	605	585	-	530	524	-
Stage 2	-	-	-	-	-	-	546	532	-	598	569	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	997	-	-	1198	-	-	199	246	706	220	238	555
Mov Cap-2 Maneuver	-	-	-	-	-	-	363	403	-	411	410	-
Stage 1	-	-	-	-	-	-	578	559	-	527	521	-
Stage 2	-	-	-	-	-	-	469	529	-	558	542	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.02	0.09	14.06	13.95
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	441	997	-	-	1198	-	-	505
HCM Lane V/C Ratio	0.098	0.046	-	-	0.005	-	-	0.205
HCM Ctrl Dly (s/v)	14.1	8.8	-	-	8	-	-	14
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.8

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	174	151	46	250	0	109	0	39	1	1	3
Future Vol, veh/h	0	174	151	46	250	0	109	0	39	1	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	10	10	10	8	8	8	8	8	8	0	0	0
Mvmt Flow	0	245	213	65	352	0	154	0	55	1	1	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	352	0	0	458	0	0	834	833	351	727	939	352
Stage 1	-	-	-	-	-	-	351	351	-	482	482	-
Stage 2	-	-	-	-	-	-	482	482	-	245	458	-
Critical Hdwy	4.2	-	-	4.18	-	-	7.18	6.58	6.28	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.1	5.5	-
Follow-up Hdwy	2.29	-	-	2.272	-	-	3.572	4.072	3.372	3.5	4	3.3
Pot Cap-1 Maneuver	1164	-	-	1072	-	-	281	298	679	342	266	696
Stage 1	-	-	-	-	-	-	653	621	-	570	557	-
Stage 2	-	-	-	-	-	-	554	543	-	763	571	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1164	-	-	1072	-	-	257	275	679	291	246	696
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	275	-	291	246	-
Stage 1	-	-	-	-	-	-	653	621	-	527	515	-
Stage 2	-	-	-	-	-	-	508	503	-	701	571	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0	1.33	38.27	13.65
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	307	1164	-	-	280	-	-	423
HCM Lane V/C Ratio	0.679	-	-	-	0.06	-	-	0.017
HCM Ctrl Dly (s/v)	38.3	0	-	-	8.6	0	-	13.7
HCM Lane LOS	E	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	4.6	0	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	88	286	0	0	171	115	0	0	0	110	0	59
Future Vol, veh/h	88	286	0	0	171	115	0	0	0	110	0	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	3	3	3	5	5	5	0	0	0	6	6	6
Mvmt Flow	90	292	0	0	174	117	0	0	0	112	0	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	292	0	0	646	763	292	705	705	233
Stage 1	-	-	-	-	-	-	471	471	-	233	233	-
Stage 2	-	-	-	-	-	-	174	292	-	471	471	-
Critical Hdwy	4.13	-	-	4.15	-	-	7.1	6.5	6.2	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.16	5.56	-
Follow-up Hdwy	2.227	-	-	2.245	-	-	3.5	4	3.3	3.554	4.054	3.354
Pot Cap-1 Maneuver	1264	-	-	1253	-	-	387	336	752	346	356	796
Stage 1	-	-	-	-	-	-	577	563	-	761	704	-
Stage 2	-	-	-	-	-	-	832	675	-	565	553	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1264	-	-	1253	-	-	328	308	752	317	326	796
Mov Cap-2 Maneuver	-	-	-	-	-	-	328	308	-	317	326	-
Stage 1	-	-	-	-	-	-	528	515	-	761	704	-
Stage 2	-	-	-	-	-	-	769	675	-	518	506	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.9	0	0	20.57
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	424	-	-	1253	-	-	401
HCM Lane V/C Ratio	-	0.071	-	-	-	-	-	0.43
HCM Ctrl Dly (s/v)	0	8.1	0	-	0	-	-	20.6
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	2.1

HCM 7th Signalized Intersection Summary
1: NE 28th Street & NE Ingle Road

04/03/2025

Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Volume (veh/h)	148	250	380	547	351	122
Future Volume (veh/h)	148	250	380	547	351	122
Initial Q (Qb), veh	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1856	1856
Adj Flow Rate, veh/h	164	57	422	608	390	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	3	3
Cap, veh/h	247	220	656	1151	533	442
Arrive On Green	0.14	0.14	0.21	0.62	0.29	0.29
Sat Flow, veh/h	1781	1585	1781	1870	1856	1539
Grp Volume(v), veh/h	164	57	422	608	390	40
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1856	1539
Q Serve(g_s), s	3.2	1.2	5.1	6.8	6.9	0.7
Cycle Q Clear(g_c), s	3.2	1.2	5.1	6.8	6.9	0.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	247	220	656	1151	533	442
V/C Ratio(X)	0.66	0.26	0.64	0.53	0.73	0.09
Avail Cap(c_a), veh/h	876	780	801	1686	913	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.0	14.1	6.7	4.0	11.8	9.6
Incr Delay (d2), s/veh	3.0	0.6	1.3	0.4	2.0	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.1	0.9	0.6	2.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	18.0	14.7	7.9	4.4	13.7	9.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	221			1030	430	
Approach Delay, s/veh	17.1			5.8	13.4	
Approach LOS	B			A	B	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				27.0		9.6	12.0	15.0
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s				33.0		18.0	10.5	18.0
Max Q Clear Time (g_c+I1), s				8.8		5.2	7.1	8.9
Green Ext Time (p_c), s				3.9		0.5	0.5	1.6

Intersection Summary	
HCM 7th Control Delay, s/veh	9.3
HCM 7th LOS	A

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	70	539	25	16	365	17	20	2	9	13	0	53
Future Vol, veh/h	70	539	25	16	365	17	20	2	9	13	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	3	3	3	13	13	13	3	3	3
Mvmt Flow	75	580	27	17	392	18	22	2	10	14	0	57

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	411	0	0	606	0	0	1170	1189	593	1167	1193	402
Stage 1	-	-	-	-	-	-	744	744	-	436	436	-
Stage 2	-	-	-	-	-	-	427	445	-	731	757	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.23	6.63	6.33	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.23	5.63	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.23	5.63	-	6.13	5.53	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.617	4.117	3.417	3.527	4.027	3.327
Pot Cap-1 Maneuver	1148	-	-	967	-	-	161	179	486	170	186	646
Stage 1	-	-	-	-	-	-	390	406	-	597	578	-
Stage 2	-	-	-	-	-	-	585	556	-	412	414	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1148	-	-	967	-	-	135	164	486	152	171	646
Mov Cap-2 Maneuver	-	-	-	-	-	-	295	314	-	314	324	-
Stage 1	-	-	-	-	-	-	365	379	-	586	568	-
Stage 2	-	-	-	-	-	-	524	546	-	375	387	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.92	0.35	16.97	12.76
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	334	1148	-	-	967	-	-	535
HCM Lane V/C Ratio	0.1	0.066	-	-	0.018	-	-	0.133
HCM Ctrl Dly (s/v)	17	8.4	-	-	8.8	-	-	12.8
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.2	-	-	0.1	-	-	0.5

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	365	127	12	241	0	137	1	5	0	1	3
Future Vol, veh/h	5	365	127	12	241	0	137	1	5	0	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	4	4	4	6	6	6	25	25	25
Mvmt Flow	5	369	128	12	243	0	138	1	5	0	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	243	0	0	497	0	0	711	711	433	647	775	243
Stage 1	-	-	-	-	-	-	443	443	-	268	268	-
Stage 2	-	-	-	-	-	-	268	268	-	379	507	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.16	6.56	6.26	7.35	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.35	5.75	-
Follow-up Hdwy	2.218	-	-	2.236	-	-	3.554	4.054	3.354	3.725	4.225	3.525
Pot Cap-1 Maneuver	1323	-	-	1057	-	-	343	353	614	354	304	742
Stage 1	-	-	-	-	-	-	586	569	-	690	647	-
Stage 2	-	-	-	-	-	-	729	680	-	598	503	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1323	-	-	1057	-	-	334	347	614	343	298	742
Mov Cap-2 Maneuver	-	-	-	-	-	-	334	347	-	343	298	-
Stage 1	-	-	-	-	-	-	583	566	-	681	639	-
Stage 2	-	-	-	-	-	-	715	671	-	589	500	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.08	0.4	23.24	11.71
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	339	17	-	-	85	-	-	541
HCM Lane V/C Ratio	0.426	0.004	-	-	0.011	-	-	0.007
HCM Ctrl Dly (s/v)	23.2	7.7	0	-	8.4	0	-	11.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	2.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	166	0	0	234	96	0	0	0	131	0	110
Future Vol, veh/h	41	166	0	0	234	96	0	0	0	131	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	10	10	10	6	6	6	0	0	0	12	12	12
Mvmt Flow	48	195	0	0	275	113	0	0	0	154	0	129

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	388	0	0	195	0	0	567	680	195	624	624	332
Stage 1	-	-	-	-	-	-	292	292	-	332	332	-
Stage 2	-	-	-	-	-	-	275	388	-	292	292	-
Critical Hdwy	4.2	-	-	4.16	-	-	7.1	6.5	6.2	7.22	6.62	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.62	-
Follow-up Hdwy	2.29	-	-	2.254	-	-	3.5	4	3.3	3.608	4.108	3.408
Pot Cap-1 Maneuver	1128	-	-	1354	-	-	437	376	851	384	389	687
Stage 1	-	-	-	-	-	-	721	675	-	661	627	-
Stage 2	-	-	-	-	-	-	735	612	-	695	653	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1128	-	-	1354	-	-	338	358	851	366	370	687
Mov Cap-2 Maneuver	-	-	-	-	-	-	338	358	-	366	370	-
Stage 1	-	-	-	-	-	-	686	642	-	661	627	-
Stage 2	-	-	-	-	-	-	597	612	-	662	622	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.65	0	0	24.09
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	357	-	-	1354	-	-	465
HCM Lane V/C Ratio	-	0.043	-	-	-	-	-	0.61
HCM Ctrl Dly (s/v)	0	8.3	0	-	0	-	-	24.1
HCM Lane LOS	A	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	4

Queuing and Blocking Report
2025 Existing Conditions - AM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	88	166	109	89	193	55
Average Queue (ft)	33	80	47	35	85	20
95th Queue (ft)	74	141	86	75	153	46
Link Distance (ft)	627	627	636	636	1278	1278
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: N Hargrave Street & NE 28th Street

Movement	EB	NB	SB
Directions Served	L	LTR	LTR
Maximum Queue (ft)	53	30	63
Average Queue (ft)	8	4	23
95th Queue (ft)	34	19	50
Link Distance (ft)	1308	698	442
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	11	88	101	28
Average Queue (ft)	1	12	38	3
95th Queue (ft)	8	49	71	18
Link Distance (ft)	1506	2563	694	464
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2025 Existing Conditions - AM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	72	4	108
Average Queue (ft)	16	0	46
95th Queue (ft)	51	3	84
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2025 Existing Conditions - PM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	82	89	151	110	144	64
Average Queue (ft)	34	35	66	47	66	26
95th Queue (ft)	68	68	114	91	117	53
Link Distance (ft)	627	627	636	636	1278	1278
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: N Hargrave Street & NE 28th Street

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	41	2	16	48	56
Average Queue (ft)	7	0	1	9	20
95th Queue (ft)	28	2	8	34	47
Link Distance (ft)	1308	1308	972	698	442
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	21	46	78	42
Average Queue (ft)	1	5	32	4
95th Queue (ft)	10	28	61	23
Link Distance (ft)	1506	2563	694	464
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2025 Existing Conditions - PM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	54	111
Average Queue (ft)	6	53
95th Queue (ft)	32	91
Link Distance (ft)	2563	567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2027 Background Conditions - AM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	115	284	134	116	275	94
Average Queue (ft)	47	127	62	48	142	30
95th Queue (ft)	91	228	109	96	231	66
Link Distance (ft)	627	627	636	636	1278	1278
Upstream Blk Time (%)		0				
Queuing Penalty (veh)		0				
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: N Hargrave Street & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	56	11	37	69
Average Queue (ft)	13	1	14	33
95th Queue (ft)	42	8	39	59
Link Distance (ft)	1308	972	698	442
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	11	101	125	26
Average Queue (ft)	0	18	49	6
95th Queue (ft)	5	64	95	24
Link Distance (ft)	1506	2563	694	464
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2027 Background Conditions - AM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	97	4	119
Average Queue (ft)	24	0	50
95th Queue (ft)	69	4	91
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2027 Background Conditions - PM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	116	128	213	185	250	74
Average Queue (ft)	54	53	103	78	114	35
95th Queue (ft)	96	97	175	142	196	62
Link Distance (ft)	627	627	636	636	1278	1278
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: N Hargrave Street & NE 28th Street

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	TR	LTR	LTR
Maximum Queue (ft)	55	30	6	61	63
Average Queue (ft)	17	4	0	17	30
95th Queue (ft)	44	20	5	48	53
Link Distance (ft)	1308	972	972	698	442
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	29	49	119	44
Average Queue (ft)	2	5	48	4
95th Queue (ft)	12	29	89	23
Link Distance (ft)	1506	2563	694	464
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2027 Background Conditions - PM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	75	7	162
Average Queue (ft)	14	0	66
95th Queue (ft)	47	7	117
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2027 Buildout Conditions - AM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	128	260	127	105	290	86
Average Queue (ft)	50	124	59	44	146	30
95th Queue (ft)	98	215	101	87	252	64
Link Distance (ft)	627	627	636	636	1278	1278
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: N Hargrave Street & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	51	18	49	75
Average Queue (ft)	13	1	23	35
95th Queue (ft)	41	8	47	63
Link Distance (ft)	1308	972	698	442
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	15	98	141	28
Average Queue (ft)	0	19	51	4
95th Queue (ft)	6	67	109	19
Link Distance (ft)	1506	2563	694	464
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2027 Buildout Conditions - AM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	117	8	120
Average Queue (ft)	28	1	52
95th Queue (ft)	78	6	94
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

Queuing and Blocking Report
2027 Buildout Conditions - PM Peak Hour 04/03/2025

Intersection: 1: NE 28th Street & NE Ingle Road

Movement	SE	SE	NE	NE	SW	SW
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	117	123	206	192	235	76
Average Queue (ft)	55	54	103	80	114	37
95th Queue (ft)	99	97	173	146	196	67
Link Distance (ft)	627	627	636	636	1278	1278
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: N Hargrave Street & NE 28th Street

Movement	EB	EB	WB	NB	SB
Directions Served	L	TR	L	LTR	LTR
Maximum Queue (ft)	56	16	39	81	72
Average Queue (ft)	16	1	6	24	31
95th Queue (ft)	43	12	26	58	56
Link Distance (ft)	1308	1308	972	698	442
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: NE 232nd Avenue/Driveway & NE 28th Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	36	56	115	47
Average Queue (ft)	2	7	49	5
95th Queue (ft)	17	34	91	26
Link Distance (ft)	1506	2563	694	464
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2027 Buildout Conditions - PM Peak Hour 04/03/2025

Intersection: 4: Driveway & NE 28th Street & SR-500

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	60	6	145
Average Queue (ft)	16	0	66
95th Queue (ft)	49	4	114
Link Distance (ft)	2563	927	567
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 0

TRUE NORTH
GEOTECHNICAL

Pacific Lifestyle Homes
Geotechnical Engineering Evaluation

Landing at Green Mountain Phase 2
22111, 22015, & 22007 NE 28th St
Camas, Washington

True North Project No. 24-0431-2

April 2025 (revised June 2025)

April 18, 2025 (revised June 17, 2025)

Pacific Lifestyle Homes (PLH)
11815 NE 99th Street, Suite 1200
Vancouver, WA 98682
Attn: Nick Edwards
Email: nicke@buildplh.com

Subject: Geotechnical Engineering Evaluation
Landing at Green Mountain Phase 2
22111, 22015, & 22007 NE 28th St
Camas, Clark County, Washington
Clark County Parcel Nos. 173169000, 173210000, & 173177000
True North Project # 24-0431-2

True North Geotechnical Services (True North) is pleased to submit our finalized Geotechnical Engineering Evaluation for the project noted above. This report was prepared in accordance with "True North Geotechnical - General Services Agreement (GSA) P24-0431-2" dated March 19, 2025, which was authorized by Samantha Zimmer with PLH on March 24, 2025. This report is intended to build off our conclusions summarized in our previously issued report, "Preliminary Geotechnical Engineering Evaluation – Landing at Green Mountain Phase 2", dated January 30, 2025. This report summarizes the entirety of our work accomplished and provides our geotechnical recommendations for development of the property with the proposed Landing at Green Mountain Phase 2 development.

PROJECT UNDERSTANDING

Our current understanding of the project is based on the information provided to True North by Pacific Lifestyle Homes (PLH). We have been provided the following document related to the proposed project:

- **A one-page sketch, untitled, undated, unsigned**. This pre-application drawing shows the layout of the proposed development, including 57 single-family lots, a network of 2-lane local streets, and the proposed stormwater facility. The proposed development is overlain on the site's existing conditions and includes an existing Bonneville Power Administration (BPA) transmission line easement.

Briefly, we understand that the subdivision will be developed with 57 single-family residential lots with concrete driveways. The remainder of the property will be developed with asphalt paved roads, associated utilities, landscape/hardscape, and stormwater management facilities. It is our understanding that the existing residence within the central property will remain, as will approximately an acre of pasture at the south of the residence.

We understand this project is in the preliminary planning stages. As such, we have not been provided any structural drawings or foundation loads other than an indication that the single-family residences will be 1- or 2-story buildings. Preliminarily, we have assumed that maximum building loads will on the order of be 4 kips per linear foot for continuous wall footings, 25 kips per isolated column footing, and 150 psf for floor slabs on grade. As the site is generally flat, or gently sloped, we anticipate cuts and fills no greater than 2 to 4 feet, with the exception of utility trenches, and assuming the proposed new residences are not planned to have basements. Finally, we have assumed that the proposed development will be constructed in accordance with the provisions of the 2021 International Building Code (IBC) as well as any jurisdictional code requirements.

SCOPE OF SERVICES

The purpose of our services was to explore the site surface and subsurface conditions in order to provide preliminary geotechnical recommendations for the proposed development. The following describes our specific scope of services:

- **Geologic Map Review**: We reviewed relevant available geologic maps of the site for information regarding geologic conditions and hazards at or near the site.
- **Subsurface Explorations**: We excavated 2 additional test pits (TP-5 and TP-6), to depths ranging between 8 to 9.5 feet below existing ground surface (bgs) across the existing lot to the far east, at the locations shown on Figure 2. This is in addition to our previously completed work, where we excavated a total of 4 test pits (TP-1 through TP-4) at the locations shown on Figure 2. Soil samples were collected from the major strata encountered in each test pit.
- **Infiltration Testing:** We previously performed infiltration testing at the location of the proposed stormwater detention facility, at a depth determined by the Geotechnical Engineer in the field. Infiltration testing was attempted at the location of IT-1 at a depth of 5.5 feet in the silty sand with gravel layer.
- **Laboratory Testing:** All samples were returned to our office and select samples were subjected to additional laboratory testing, that included: in-situ moisture content and fines content testing.
- **Engineering Analyses:** All data collected during the subsurface exploration, literature research, and laboratory testing was evaluated and used to develop geotechnical design and construction recommendations.
- **Geotechnical Engineering Evaluation:** This document summarizes our geotechnical services, and includes:
  - A site vicinity map and site plan showing the approximate locations of our explorations.
  - A discussion of subsurface conditions encountered including pertinent soil and rock properties as well as the encountered groundwater conditions.
  - Geotechnical related recommendations for foundation design including allowable bearing capacity and estimated settlements.
  - Seismic design parameters in accordance with ASCE 7-16.

- Structural fill recommendations, including an evaluation of whether the in-situ soils can be used as structural fill.
- Floor slab support recommendations.
- General retaining wall design parameter recommendations, including earth pressures, backfill, and drainage.
- Flexible and rigid pavement design recommendations.
- General comments regarding site grading and drainage.
- Discussions on other geotechnical issues that may impact the project.

SITE CONDITIONS

Surface Description

The proposed development is a combined 14.74-acre lot, located at 22111, 22015, and 22007 NE 28th Street, Camas, Clark County, Washington; Clark County Parcel numbers 173177000, 173210000, and 173169000, respectively. The site is bound to the north by NE 28th Street, to the west by a similarly rural single-family residence, and to the east by Phase 1 of the Landing at Green Mountain development, also owned by PLH. The parcel to the south is maintained as an open park space by Clark County Parks.

As mentioned above, the combined property of interest consists of three separate lots, all currently developed with single family residences and all associated utilities. Generally, all existing development is located within the northern portion of the parcels, closer to NE 28th Street. The central and eastern lots have gravel driveways and several outbuildings south of the residences; the western lot has an asphalt-paved driveway and does not have any additional structures. It is our understanding that the existing single-family residence and outbuildings on the central lot will remain, in addition to approximately an acre of pasture south of the outbuildings. We understand that the remaining structures on the east and west parcels are currently planned to be demolished to make way for the new development.

The central and eastern lots are generally maintained as fenced pasture, with some mature evergreen and deciduous trees surrounding the existing residences, along the fence lines, and concentrated at the southern extents of the lots. The northern quarter of the western lot is generally used as storage for fence debris and associated equipment for a fencing contractor operating out of the property, in addition to the existing residence. The central half of the western lot is partially within a wetlands area mapped by the National Wetlands Inventory (NWI), and as such, there is extensive standing water across the ground surface of the central half of this lot. The vegetation in this area is characteristic of wetland plants and mostly consists of dense, tall reeds and mature aspen trees. The southern extent of the western lot is heavily forested with mature evergreen and deciduous trees and low undergrowth.

In terms of topography, the northeastern corner of the property is located at approximately 280 feet AMSL (above median sea level), and the site descends at a gentle 0 to 10 percent gradient to the

southwestern corner of the property, which is located at 222 feet AMSL. Overall, the slope descending from northeast to southwest across the development area is very gentle and consistent, with very few areas that may be considered locally flatter and/or steeper.

Geologic Setting

The map area lies on the eastern margin of the Portland Basin, which is part of the Puget-Willamette Lowland that separates the Cascade Range from the Oregon Coast Range. Since the late Eocene era, the Cascade Range has been the locus of an episodically active volcanic arc associated with underthrusting of oceanic lithosphere beneath the North American continent along the Cascadia Subduction Zone.

The underlying geologic unit at the subject property is mapped by the Washington Geologic Information Portal as “QTc – Quaternary-Tertiary continental sedimentary rocks and deposits – conglomerate with sandy and silty facies. Quaternary-Miocene pebble, cobble, and boulder gravel. Pleistocene-Pliocene gravel, sand, silt, and clay; deposits of the ancestral Columbia River.”

According to the USDA Soil Survey, there are a number of surficial soils mapped at the site. Within the eastern lot, there are three mapped soils, which include: Lauren gravelly loam (LgB), 0 to 8 percent slopes, Lauren loam (LeB), 0 to 8 percent slopes, and McBee silt loam (MlA), coarse variant, 0 to 3 percent slopes. The Lauren series is considered to be well drained, with moderately high to high permeability, while the McBee series is a poorly drained, hydric soil, which have shallow depths to the water table and experience regular or extended flooding or ponding.

Subsurface Conditions

On December 16, 2024, we visited the site to excavate four exploratory test pits (TP-1 through TP-4), as part of our preliminary evaluation of the site. On March 21, 2025 we returned to excavate two additional test pits (TP-5 and TP-6). In all, we excavated a total of 6 test pits to depths ranging between 4.5 and 10 feet below existing ground surface (bgs) across the proposed development area. Soil samples were collected from the major strata encountered in each test pit and at the bottom of the infiltration test location, and were returned to our office for examination and index testing. See Figure 2 - Site & Exploration Plan for the locations of our explorations. Descriptions of field and lab procedures and the exploration logs are included in Appendix A. The following is a highly generalized description of the subsurface units encountered:

Native SILT

At the ground surface of all explorations, we encountered various soft, fine-grained soils, ranging from silt with varying amounts of clay at TP-1, TP-3 TP-4, TP-5 and TP-6 to highly organic clay at TP-2. These soft surficial soils extended to depths ranging between 1 to 5 feet bgs. Laboratory tests conducted on soil samples retrieved from this layer returned moisture contents ranging from 24 to 39 percent.

Native Sandy CLAY and Silty CLAY with Sand

Underlying the surficial silt at TP-2, TP-4 and TP-5, we encountered soft to medium stiff Sandy CLAY, which extended to depths of about 5 and 6.5 feet bgs, respectively. Laboratory testing conducted on samples retrieved from this layer returned a moisture content of 31 to 36 percent, and a fines content of 52 to 68 percent.

Native Silty SAND and GRAVEL

Underlying the sandy clay at TP-2 and TP-5 and the surficial silt at TP-1, TP- 3 and TP-6, we encountered dense Silty SAND and dense Silty GRAVEL, extending to depths of 8.5 and 7.5 feet bgs, respectively. Laboratory testing conducted on samples retrieved from this layer returned moisture contents ranging from 29 to 45 percent, and fines content ranging between 30 to 56 percent.

Weathered BEDROCK

Underlying the Silty SAND in and the Silty GRAVEL TP-3, TP-5 and TP-6, and underlying the Silty CLAY in TP-2, we encountered very dense Clayey SAND and GRAVEL with Clay, which we interpreted to be weathered bedrock. This layer extended to the termination depths of both explorations. Laboratory testing conducted on samples retrieved from this layer returned moisture contents ranging from 33 to 54 percent.

Groundwater

Groundwater was encountered in all our explorations except TP-6 at depths ranging from about 2 to 3.5 feet bgs. TP-1, TP-2, TP-4, TP-5 were excavated within or very near to the mapped hydric soils in the west and central areas of the site, TP-3 was excavated in non-hydric soils. Data published on Clark County MapsOnline indicates that overall, groundwater at the site is located between 0 to 20 feet bgs, which corresponds to the groundwater conditions observed during our explorations.

Depending on the time of year of construction, it may be possible that groundwater could be an issue during shallow foundation construction.Utility trenches may encounter perched water during construction, requiring the use of shoring and dewatering methods. Due to the shallow groundwater and hydric soils across the site, infiltration of stormwater is likely not feasible. Groundwater elevations can fluctuate depending on the time of year of construction and changes in land use.

Geologic Hazards Review

The following provides a geologic hazards review for the subject site in accordance with CCC 40.430. The geologic hazard review is based on our site reconnaissance and explorations, as well as a review of publicly available published literature and maps.

Mapped Hazards: As a part of our due diligence, we reviewed the Clark County Property Information Center - MapsOnline website (https://gis.clark.wa.gov/gis/property) for information on geologic

hazards present at this property. No geologic hazards are mapped on this property. The site is mapped as having an NEHRP site class C and very low liquefaction susceptibility. We address the applicable sections of CCC 40.430 below:

Liquefaction: As stated above, the area to be developed is mapped as having a very low liquefaction susceptibility. This corresponds to the conditions observed in our explorations where dense soils with a significant coarse material percentage (eg, sand, gravel, cobbles, or boulders) were encountered at relatively shallow depths ranging between 4.5 and 7 feet bgs. Dense, large-grained soils below the water table (encountered at 5 feet bgs at the shallowest) have a very low potential for liquefaction.

Ground Motion Amplification: In accordance with ASCE 7-16, we recommend a Site Class C (dense soil and soft rock soil profile with an average N-value greater than 50) for this site when considering the average of the upper 100 feet of bearing material beneath the foundations. This recommendation is based on the results of our subsurface investigation as well as our understanding of the local geology.

Inputting our recommended Site Class as well as the site latitude and longitude into the ACSE 7 website (ASCE 7 Hazard Tool), we obtained the seismic design parameters shown in Table 1 below. Note that the values for F_a and F_v in Table 2 were obtained from ASCE's Supplement 3 dated November 5, 2021 and issued for ASCE 7-16 to correct some seismic design issues in the original publication.

Table 1. 2021 IBC (ASCE 7-16, Supplement 3) Seismic Design Parameters

Location	Short Period	1-Second
Maximum Credible Earthquake Spectral Acceleration	S_s = 0.794 g	S_1 = 0.350 g
Site Class	C	
Site Coefficient	F_a = 1.2	F_v= 1.5
Adjusted Spectral Acceleration	S_{MS} = 0.953 g	S_{M1} = 0.525 g*
Design Spectral Response Acceleration Parameters	S_{DS} = 0.635 g	S_{D1} = 0.350 g
MCE_G Peak Ground Acceleration	MCE_G PGA = 0.355 g	
Site Amplification Factor at PGA	F_{PGA} = 1.2	
Site Modified Peak Ground Acceleration	PGA_M = 0.427 g	

g – acceleration due to gravity, * See note below.

The return interval for the ground motions reported in the table above is 2 percent probability of exceedance in 50 years.

Infiltration Testing

We attempted infiltration testing at the location of the proposed infiltration facility, at a depth of approximately 5.5 feet bgs. No reliable data was collected over the course of the test, due to the presence of surface water and potential shallow groundwater.

Based on this and the presence of shallow groundwater at most of our other explorations, as well as the presence of hydric soil indicators across the site, it is our opinion that infiltration is not a feasible method of stormwater management at this site.

CONCLUSIONS AND RECOMMENDATIONS

Geotechnical Design and Construction Considerations

Based on the results of our Preliminary Geotechnical Engineering Evaluation, development of the site with the proposed development is feasible provided the recommendations in this report are included in the project design and implemented during construction. Again, this is a preliminary geotechnical investigation meant to create a “broad brush” understanding of the subsurface conditions across the site. We recommend lot-specific geotechnical explorations and recommendations if more detailed information is required/recommended.

The primary geotechnical concerns associated with the project are:

1. **Presence of soft surficial soils.** As noted above, we encountered variable depths of soft surficial soils across the site, ranging in thickness from 1 to 5 feet below existing ground surface (bgs). During mass grading we expect much of the surficial soils will be removed from the site or stockpiled for later use in landscape areas. Once the subgrade has been approved by True North, mass grading may begin using suitable onsite material or imported structural/engineered fill. We expect that foundations will generally bear on properly placed and compacted structural/engineer fill.

2. **Presence of shallow groundwater and surficial water.** As stated above, we encountered groundwater at nearly all test pit locations over the course of our explorations. TP-1, TP-2, TP-4, and TP-5 were excavated within or very near to mapped hydric soils, and TP-2 was excavated just north of mapped NWI wetlands area, in a location with an excess of surficial water. It is also possible that the standing water at the ground surface may be an issue for mass grading and shallow foundation construction, and the contractor may need to take steps to dewater much of the western lot before beginning grading activities, depending on the time of year.

   Additionally, utility trenches and other embedded structure excavations will likely encounter groundwater during development of the site. The contractor will need to be prepared for this condition.

As discussed previously, based on this and the presence of shallow groundwater at most of our explorations, as well as the presence of hydric soil indicators across the site, it is our opinion that infiltration is not a feasible method of stormwater management at this site.

In summary, provided the recommendations in this report are adhered to, we do not foresee any major issues that would preclude the proposed development. The above-mentioned factors are listed to draw the attention of the reader to the issues to address during design and construction.

Moisture Sensitive Soils/Weather Related Concerns

The fine-grained soils at this site are considered moisture sensitive. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

Given the depth of the soft surficial soils encountered across this site, the contractor may need to consider the construction of temporary haul roads depending on the time of year construction takes place. True North can provide more detailed wet weather recommendations if needed. Stormwater should not be allowed to collect on prepared subgrades.

Site Preparation

Site preparation will include clearing, grubbing, etc. to remove the soft upper organic soils to expose the underlying, native, medium-stiff sandy/silty clay. Once the stripping has been approved we recommend proofrolling the site with a fully loaded, tandem axle dump truck to identify any excessively soft spots under the observation of the Geotechnical Engineer during various phases of construction to ensure proper fill placement. Areas not able to be adequately proofrolled (or where not practical) will be evaluated by the Geotechnical Engineer using a ½-inch diameter steel probe rod. Any soft spots identified should be over excavated to expose firm and unyielding soils and replaced with compacted structural fill.

Any utilities present beneath the proposed construction will need to be located and rerouted as necessary and any abandoned pipes or utility conduits should be removed to inhibit the potential for subsurface erosion. Utility trench excavations should be backfilled with properly compacted structural fill in accordance with the structural fill recommendations in this report.

It should be noted that, due to the soft surficial soils observed in the west of the site, construction traffic on these upper soils may have a difficult time moving around on site. We recommend consideration be given to constructing haul roads depending on site conditions at the time of construction.

Subgrade Verification

Following site preparation as described above and compaction of the exposed subgrade prior to placing aggregate base for the foundations, building pad, or pavement section, the exposed subgrade should be evaluated. Subgrades should be evaluated by qualified True North personnel using a steel foundation probe or proofrolling. Unsuitable areas identified during the evaluation should be re-compacted or be excavated and replaced with imported granular structural fill.

Excavations

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document and subsequent updates were issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

Depending on the time of year, and the depth of the excavation, groundwater may be encountered at shallow depths. If groundwater is encountered during excavation, the soils encountered in our subsurface explorations should be classified as Type C soil according to the most recent OSHA regulations. If groundwater is not encountered or dewatering is accomplished in advance of excavation, the soils may be classified as Type B soil. In our opinion, excavations should be safely sloped or shored.

If groundwater is encountered during excavation, positive groundwater control will be required, including the possibility of wells extending below the depth of excavation. Groundwater levels will be lowest in the dry season, and construction during that time will minimize groundwater control problems. The groundwater conditions at the time of construction and the contractor’s ability to control these conditions will control the degree of inclination of temporary slopes. In our opinion, temporary excavation slopes can be constructed as steep as 1.5H:1V, if groundwater levels are maintained at least 2 feet below the bottom of the excavation. Slopes should be flattened if significant seepage or running soils are encountered.

If slopes of this inclination, or flatter, cannot be constructed, or if excavations greater than four feet in depth are required, temporary shoring may be necessary. This shoring would help protect against slope or excavation collapse and would provide protection to workmen in the excavation.

We are providing this information solely as a service to our client. True North does not assume responsibility for construction site safety or the contractor's compliance with local, state, and federal safety or other regulations.

Construction Dewatering

The results of our subsurface investigations indicate that the groundwater seepage at the site is located some 1 to 5 feet below the ground surface, and will fluctuate in response to seasonal precipitation. Excavations that extend below the groundwater level may result in caving, heaving, or running soils, especially if excavations extend into the sandy clay soils encountered in our explorations. The contractor should consider the use of a network of ditches and sumps, into which water can flow to be pumped out of the excavation.

The depth and dewatering time will need to be determined at the time of construction and adjusted depending on site conditions. Unprotected working should not be allowed near temporary un-shored excavations until groundwater levels have been stabilized and shoring, such as trench shields or bracing, has been installed.

Structural Fill

Structural fill should be granular, free of organics or other deleterious materials, have a maximum particle size less than 3 inches, be relatively well graded, and have a liquid limit less than 45 and plasticity index less than 25. In our professional opinion, we anticipate the surficial fine-grained soils stripped from this site may be used only in landscape areas. These soils are moisture sensitive and could be difficult (depending on time of year of construction) to properly moisture condition and place. As such, the contractor will need to account for the need to import material to raise site grades. We recommend crushed rock structural fill be placed beneath footings, slabs, or other structural elements to allow for uniform load distribution, to provide protection from the elements, and to create a clean working surface.

We recommend all structural fill be moisture conditioned to within 3 percentage points below and 2 percentage points above optimum moisture as determined by ASTM D1557 (modified proctor). If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying.

Fill should be placed in relatively uniform horizontal lifts on the prepared subgrade which has been stripped of deleterious materials (i.e. topsoil and fill) and approved by the Geotechnical Engineer or his representative. Each loose lift should be about 1-foot thick. The type of compaction equipment used will ultimately determine the maximum lift thickness. Structural fill should be compacted to at

least 95 percent of modified proctor maximum dry density as determined by ASTM D1557. Each lift of compacted engineered fill should be tested by a representative of the Geotechnical Engineer prior to placement of subsequent lifts.

Utility Trench Backfill

Trench backfill for the utility pipe base and pipe zone should consist of well-graded granular material with a maximum particle size of ¾ inch and less than 8 percent by weight passing the U.S. Standard No. 200 Sieve. The material should be free of roots, organic matter, and other unsuitable materials.

Trench backfill should be compacted to at least 90 percent of the maximum dry density at depths greater than 4 feet below finished grade and to 95 percent of the maximum dry density within 4 feet of finished grade. Compaction is based on ASTM D1557/AASHTO T-180, the modified proctor test, or as recommended by the pipe manufacturer.

Foundation Recommendations

Once the site has been properly prepared as discussed above, the planned construction can be supported on a conventional shallow foundation system. All foundations should bear on native, undisturbed, medium stiff silty/sandy clay, or atop compacted granular crushed rock structural fill placed atop the approved subgrade soils. Spread footings for building columns and continuous footings for bearing walls supported on the above-mentioned materials can be designed for an allowable soil bearing pressure of 2,000 psf based on dead load plus design live load and can be increased by one-third when including short-term wind or seismic loads. The above allowable soil bearing pressures can be increased by one-third when including short-term wind or seismic loads. Construction shall be accomplished in accordance with the 2021 International Building Code (IBC).

Lateral frictional resistance between the base of footings and the subgrade can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.33 for concrete foundations bearing directly on the subgrade soils described above or on compacted structural fill placed atop that strata. In addition, lateral loads may be resisted by passive earth pressures based on an equivalent fluid pressure of 250 pounds per cubic foot (pcf) for footings poured “neat” against the above-mentioned soil/rock strata. These are ultimate values—we recommend a factor of safety of 1.5 be applied to the equivalent fluid pressure, which is appropriate due to the amount of movement required to develop full passive resistance.

Exterior footings and foundations in unheated areas should be located at a depth of at least 18 inches below the final exterior grade to provide adequate frost protection. If the construction takes place during the winter months and the foundation soils will likely be subjected to freezing temperatures after foundation construction, then the foundation soils should be adequately protected from freezing. Otherwise, interior foundations can be located at nominal depths compatible with architectural and structural considerations.

The foundation excavations should be observed by a representative of the Geotechnical Engineer prior to steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Unsuitable soil zones encountered at the bottom of the foundation excavations should be removed and replaced with properly compacted structural fill as directed by the Geotechnical Engineer.

The fine-grained soils at this site are moisture sensitive. As such, they should be kept to as close to their in-situ moisture content. This should be accomplished during construction by covering the soil subgrade the same day it is exposed with crushed rock structural fill. Surface run-off water should be drained away from the excavations and not be allowed to pond.

Based on the known subsurface conditions we anticipate that properly designed and constructed foundations supported on the above-mentioned materials could experience maximum total settlement on the order of 1-inch and differential settlement on the order of 1/2-inch over 30 horizontal feet.

Granular Pads: Granular pads should be used if unsuitable foundation conditions are encountered at the proposed foundation subgrade elevations. Granular pads should extend 6 inches horizontally beyond the margins of the footings for each foot of the pad thickness or to the depth of firm, undisturbed native soil. The granular pads should be a minimum of 6 inches thick, however if embedded structures are encountered in the foundation areas, the embedded structure should be removed down to a minimum 24-inches below the base of footing, and granular pads should be thickened accordingly.

The granular pads should consist of ¾-inch minus crushed rock that is fairly well graded between coarse and fine, contains no organic matter or other deleterious materials, and has less than 5 percent passing the U.S. Standard No. 200 Sieve. The imported crushed rock should be compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D 698.

Retaining Walls

We were not provided any construction drawings that would indicate if site retaining walls are necessary to complete the grading of the site. True North is available to provide a separate retaining wall design for any planned walls. We provide the following recommendations for use by the Structural Engineer in the event additional stem walls or other concrete structural walls are required for the homes.

The foundations for the proposed walls should be designed in accordance with foundation recommendations above. Lateral earth pressures on walls, which are not restrained at the top, may be calculated on the basis of an “active” equivalent fluid pressure of 40 pcf for level backfill, and 60 pcf for sloping backfill with a maximum 2H:1V slope. Lateral earth pressures on walls that are restrained from yielding at the top (i.e. stem walls) may be calculated on the basis of an “at-rest”

equivalent fluid pressure of 60 pcf for level backfill, and 90 pcf for sloping backfill with a maximum 2H:1V slope. The stated equivalent fluid pressures do not include surcharges, such as foundation, vehicle, equipment, etc., behind walls, hydrostatic pressure buildup, or earthquake loading.

For seismic loading on retaining walls with level backfill, new research indicates that the seismic load is to be applied at 1/3 H of the wall instead of 2/3 H, where H is the height of the wall. We recommend that a Mononobe-Okabe earthquake thrust per linear foot of 4.8 psf* H^2 be applied at 1/3 H, where H is the height of the wall measured in feet. For a maximum 2H:1V slope we recommend 6.6 psf*H^2. This assumes a combination of soil and granular backfill retained by the walls within the active wedge.

All backfill for retaining walls should be select granular material, such as sand or crushed rock with a maximum particle size between ¾ and 1 ½ inches, having less than 5 percent material passing the No. 200 sieve. Because of their silt content, the native soils do not meet this requirement, and it will be necessary to import material to the project for wall backfill. Silty soils can be used for the last 18 to 24 inches of backfill, thus acting as a seal to the granular backfill. All backfill behind retaining walls should be moisture conditioned to within ± 2 percent of optimum moisture content and compacted to a minimum of 90 percent of the material's maximum dry density as determined in accordance with ASTM D1557. Fill materials should be placed in layers that, when compacted, do not exceed about 8 inches. Care in the placement and compaction of fill behind retaining walls must be taken in order to ensure that undue lateral loads are not placed on the walls. An adequate subsurface drain system will need to be installed behind retaining walls to prevent hydrostatic buildup.

Slab-on-grade Floors

Support for lightly loaded floor slabs can be obtained on the undisturbed native soil or on engineered structural fill. A minimum 4-inch-thick layer of imported granular material should be placed and compacted over the prepared subgrade to assist as a capillary break and provide uniform load distribution.

A subgrade modulus of 150 pounds per cubic inch may be used to design floor slabs. Imported granular material should be crushed rock or crushed gravel and sand that is well-graded between coarse and fine, contain no deleterious materials, have a maximum particle size of 1½ inches, and have less than 5% by weight passing the U.S. Standard No. 200 Sieve. The imported granular material may be placed in one lift and should be compacted until well-keyed, about 95% of the maximum dry density as determined by ASTM D1557 (AASHTO T-180).

Pavement Recommendations

The following pavement recommendations are presented as preliminary for your consideration. We assume the roads which are to run through the development connecting N 82nd Avenue to the east and NE 28th Street to the north are classified by the City of Camas as “Local Streets”. These roads serve to distribute traffic from collectors and provide direct access for abutting properties. The City of Camas street construction details specify a minimum pavement thickness of 4 inches overlying

2 inches of crushed rock top course overlying 9 inches of crushed rock base course.

Below, we performed a preliminary analysis of the minimum design pavement section for the road noted above based on assumed traffic loading which includes residential traffic, through trips, and regular and miscellaneous heavy-vehicle traffic. The Civil Engineer for the project may have more traffic and project design data available than is presently known as well as more information regarding the County classification of the road noted above and may wish to modify and/or refine our pavement section thickness recommendations. We are available, upon request, to provide a more detailed pavement design if more definitive traffic information is available.

For analysis of the asphaltic concrete pavement section thickness design recommendations, we have assumed the following design parameters: a design life of approximately 20 years, a Terminal Serviceability Index (P_t) of 2 (i.e. poor condition), and a Regional Factor (R) of 3. We assumed an average of 1,184 trips of a passenger car in and out of the neighborhood per day (684 trips generated by residents and 500 miscellaneous through trips). We also assumed miscellaneous heavier traffic such as garbage trucks, school buses, and delivery vans/trucks. This assumed traffic loading results in 388 equivalent 18,000 pound equivalent single axle loads per day (ESALs). Additionally, we used an assumed CBR value of 3 for the existing medium stiff fine grained clayey soils. These parameters result in a required Structural Number of 3.03 for the new road. Based on these parameters, find that the standard pavement section consisting of 4 inches of Asphalt Concrete over 11 inches of aggregate base is anticipated to be sufficient for the local streets within the planned new subdivision and meets the City of Camas Engineering Standards for a two-lane Local Street, as outlined in the City of Camas Design Standards, Standard Detail ST2. Again, we are available to modify our recommendation if provided with more detailed pavement design traffic loadings and/or route classification.

We recommend the subgrade be proofrolled with a fully loaded tandem axle dump truck dump truck to confirm adequate subgrade conditions. It is possible that there will be areas that are observed to yield that will require correction prior to pavement construction (i.e. ripping wet subgrade soils with the teeth of a dozer to dry them out, and/or re-compacting soils that are soft).

We recommend the placement of a woven geotextile fabric (Mirafi HP270 or equivalent) over the native soil subgrade after it has been prepared and approved, to reduce the risk of contaminating the base course with the native fine-grained soil. Asphalt pavement base course material should consist of a well-graded 1½-inch or ¾-inch-minus crushed rock having less than 5 percent material passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the State of Washington, Standard Specifications for Highway Construction. Base course material should be moisture conditioned to within ± 2 percent of optimum moisture content, and compacted to a minimum of 95 percent of the material's maximum dry density as determined in accordance with ASTM D1557 (Modified Proctor). Fill materials should be placed in layers that, when compacted, do not exceed about 8 inches. Asphaltic

concrete material should be compacted to at least 91 percent of the material's theoretical maximum density as determined in accordance ASTM D2041 (Rice Specific Gravity).

In order to achieve the assumed 20 year design life, pavement requires regular maintenance to protect the underlying subgrade from being damaged. The primary concern is subgrade saturation which can cause it to weaken. Proper site drainage should be maintained to protect pavement areas. In addition, cracks that develop in the pavement should be sealed on a regular basis.

Drainage: Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as around stormwater catch basins. Effective means to prevent saturation of the base course including installing weep holes in the sidewalls to catch basins.

Geotextile Separation Fabric: A geotextile separation fabric will be required at the interface of the native soil and imported subgrade material beneath the proposed roadways. The separation fabric should meet the specificiation provided in WSS 9-33.2(1) – Geotextile Properties (Table 3) for soil separation. The geotextile should be installed in conformance with the specifications provided in WSS 2-12 – Construction Geosynthetic.

Stabilization Material: In the case of unsuitable or unstable pavement subgrade conditions, stabilization material consisting of pit- or quarry-run rock or crushed rock should be placed below the above-described pavement sections. The material should have a maximum particle size of 6-inches and less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve, have at least two mechanically fractured faces, and be free or organic matter or other deleterious material. Material meeting the specification provided in WSS 9-27.3(6) – Stone is generally acceptable for use. Stabilization material should be placed in lifts between 12 and 18 inches thick and compacted to a firm condition with a smooth-drum roller without using vibratory action.

Drainage and Groundwater Considerations

The Contractor should be made responsible for temporary drainage of surface water and groundwater as necessary during construction to prevent standing water and/or erosion at the site.

As a matter of good construction practice, we recommend that perimeter drains be installed for all buildings. Perimeter drains should consist of perforated drainpipe embedded in a zone of free draining fill that is wrapped in a non-woven geotextile filter. The pipe should be connected to a tightline drainpipe leading to storm drain facilities. Foundation and crawl space drainage should be sloped to drain to a sump or low point drain outlet. Water should not be allowed to pond within crawl spaces. Roof drains should be connected to a tightline drainpipe leading to storm drain outlet facilities.

Water should not be allowed to collect in the foundation excavations or on prepared subgrades for the foundations/slabs/roadway during construction. Positive site drainage should be maintained throughout construction activities. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff.

The site grading plan should be developed to provide rapid drainage of surface water away from the building areas and to inhibit infiltration of surface water around the perimeter of the buildings and beneath the floor slabs. The grades should be sloped away from the building area. We anticipate stormwater will be routed to a stormwater management system to be constructed as part of this development.

Soil Erosion

Site-specific erosion control measures should be implemented to address the maintenance of slopes or exposed areas. This may include silt fence, bio-filter bags, straw wattles, or other suitable methods. During construction, all exposed areas should be well compacted and protected from erosion. Temporary slopes or exposed areas may be covered with straw, crushed aggregate, or rip in localized areas to minimize erosion.

CONSTRUCTION OBSERVATIONS

Satisfactory earthwork performance depends on the quality of construction. Sufficient monitoring of the contractor's activities is a key part ensuring that work is completed in accordance with the construction drawings and specifications. We recommend that True North observe that the subsurface conditions observed during our site investigation are consistent with those encountered during construction, and that foundation subgrades are suitable for placement of structural fill, rebar, or concrete for the new structures. True North cannot accept any responsibility for any conditions that deviate from those described in this report, nor for the performance of the foundations if not engaged to also provide construction observation for this project.

The City of Camas will require a final letter of geotechnical compliance before they finalize a permit. If such a letter is required, a representative from True North MUST observe foundation subgrades PRIOR to concrete being poured for the foundation. If True North does not perform this observation, we cannot provide a final letter of geotechnical compliance, and a permit will not be eligible for final sign-off. It is the owner's responsibility to ensure that True North be notified in a timely manner (i.e., at least 48 hours prior to the required observation) of the need for our services during construction.

LIMITATIONS

This report was prepared for the exclusive use of Pacific Lifestyle Homes and members of the design team for specific application to the Landing at Green Mountain Phase 2 development located at the address noted above. It should be made available to prospective contractors for information on the factual data only, and not as a warranty of subsurface conditions such as those interpreted

from the explorations and presented in the discussions of the subsurface conditions included in this report.

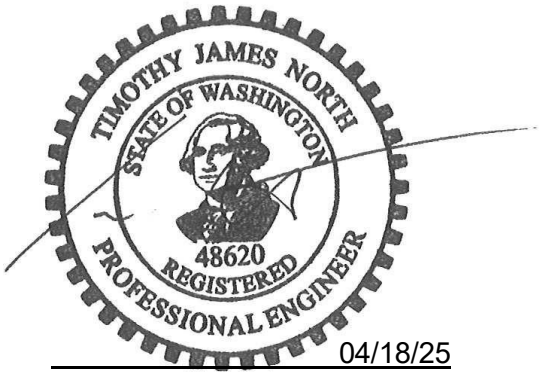
The recommendations contained in this report are based on information derived through subsurface sampling. No matter how effective subsurface sampling may be, variations between exploration location and the presence of unsuitable materials are possible and cannot be determined until exposed during construction. Accordingly, True North's recommendations can be finalized only through True North's observation of the project's earthwork construction. True North accepts no responsibility or liability for any party's reliance on True North's preliminary recommendations.

Within the limitations of the scope, schedule and budget, the analyses, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted professional geotechnical engineering principles and practice in this area at the time this report was prepared. We make no warranty, either express or implied.

CLOSING

We appreciate the opportunity to be of service to you. If you have any questions, or if we can be of further assistance to you, please contact us at (360) 984-6584.

Respectfully Submitted,



04/18/25

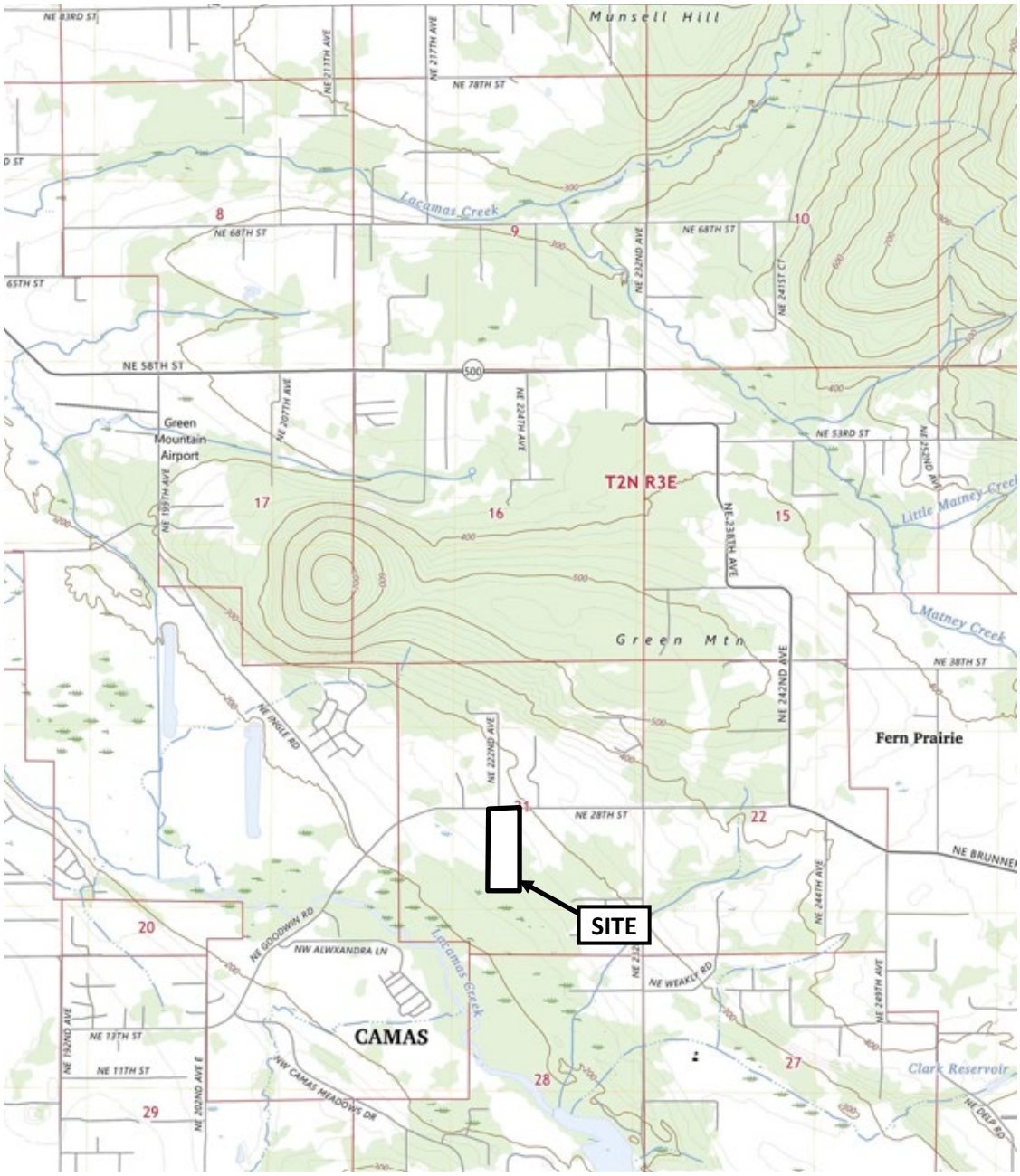
Timothy J. North, P.E.
Principal Geotechnical Engineer

Reviewed By:

Lauren Shepherd, E.I.T.
Staff Geotechnical Engineer

Attachment: Figure 1 – Site Vicinity
Figure 2 – Site Layout and Explorations
Figure 3 – Site Photographs
Appendix A – Field Exploration Methods, Lab Testing Procedures, Exploration Logs

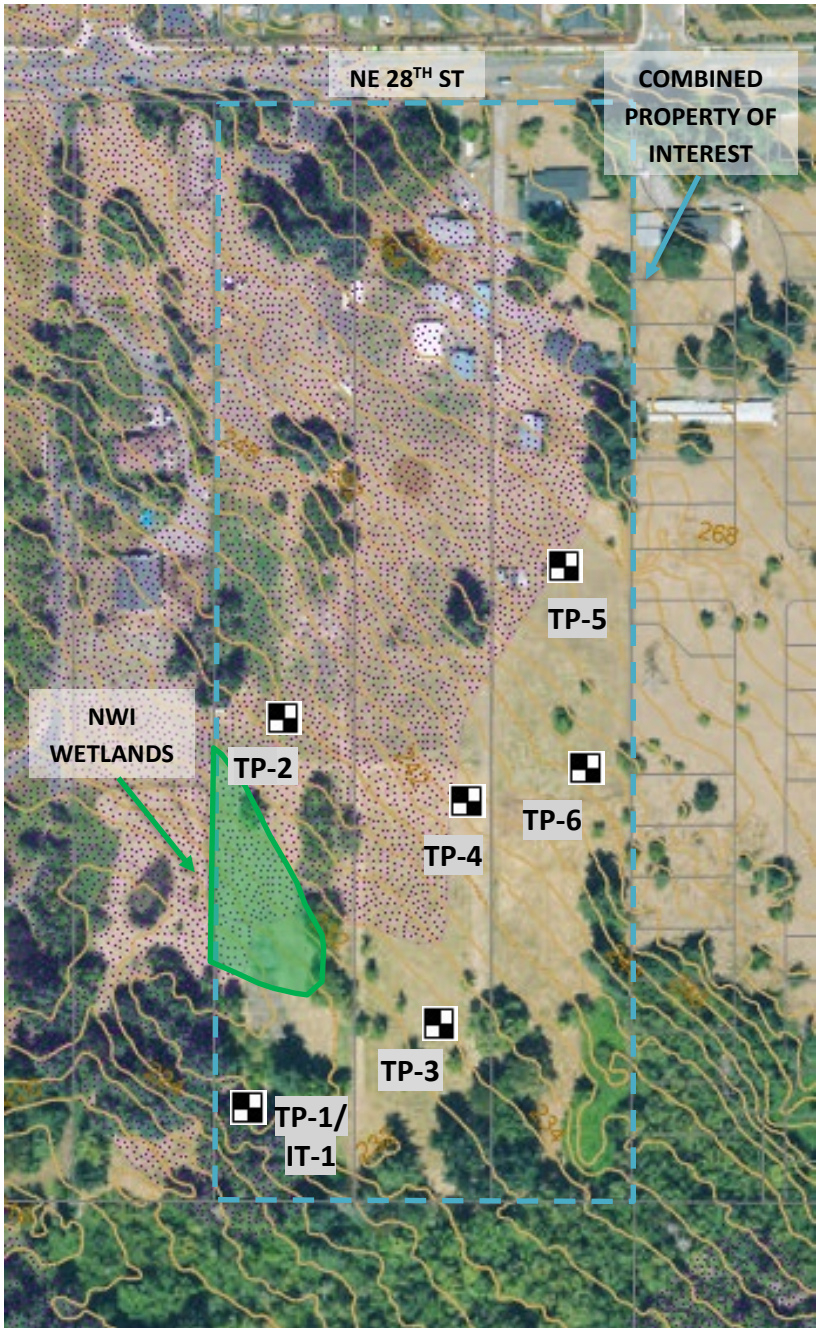
FIGURES



Not to Scale

Source: "Topographic Map of the Lacamas Creek Quadrangle, 7.5 minute series" 2023, United States Geological Survey (USGS).

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 1 – Vicinity Map



Scale: 1" ≈ 200'

■ TP-1 Approximate Exploratory Test Pit Locations, December 16, 2024, and March 21, 2025.

Note: Purple shading indicates hydric soils.

Source: Aerial & Topo – Clark County MapsOnline, accessed January 6, 2025.

TRUE NORTH ◆ GEOTECHNICAL ◆	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	March 2025	Figure 2 – Site & Exploration Plan



Photo 1. From the approximate location of TP-2, looking south at the location of TP-1



Photo 2. From the approximate location of TP-2, looking east across the combined properties

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3A – Site Photographs (1 of 4)



Photo 3. From the approximate center of the eastern lot, looking southwest



Photo 4. From the approximate center of the center lot, looking north at the existing structures on the lots.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3B – Site Photographs (2 of 4)



Photo 1. TP-6 in progress, looking northwest



Photo 2. TP-6 in progress, looking west

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3C – Site Photographs (3 of 4)



Photo 3. TP-5 in progress, looking southeast



Photo 4. Existing structures on the eastern lot, looking north.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3D – Site Photographs (4 of 4)

APPENDIX A

Field Exploration Procedures
Laboratory Testing Procedures
Test Pit Logs

FIELD EXPLORATION PROCEDURES

General

We excavated a total of 26test pits (TP-1 and TP-6) to depths ranging between 8 and 10 feet below existing ground surface (bgs) across the proposed development area. The excavations were advanced utilizing a Link-Belt 80 X3 with a 30-inch wide toothed bucket subcontracted from Thompson Brothers Excavating. Soil samples were collected from the major strata encountered in each test pit and at the bottom of each infiltration test pit location The approximate exploration locations are shown in Figure 2.

Soil Sampling

Representative grab samples of the soil observed in the explorations were obtained from the sidewalls or spoils. Samples obtained in the exploration were sealed in airtight, plastic bags to retain moisture and returned to our laboratory for additional examination and testing. The test explorations were loosely backfilled.

Pocket Penetrometer Testing

The undrained shear strength of fine-grained soil (silt and clay) was estimated with a pocket penetrometer applied to the sidewalls of the test pits. A pocket penetrometer is a hand-held device that indicates undrained compressive strength in tons per square foot. The test method is approximate and applicable only to fine-grained soil.

Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, peculiar odors, and other distinguishing characteristics of the soil samples were noted. The terminology used is described in the key and glossary that follow.

Summary Exploration Logs

Results from the explorations are shown in the summary exploration logs. The left-hand portion of a log provides our interpretation of the soil encountered, sample depths, and groundwater information. The right-hand, graphic portion of a log shows the results of pocket penetrometer and laboratory testing. Soil descriptions and interfaces between soil types shown in summary logs are interpretive, and actual transitions may be gradual.

LABORATORY TESTING PROCEDURES

Soil samples obtained during field explorations are examined in our laboratory, and representative samples may be selected for further testing.

Visual-Manual Classification

Soil samples are classified in general accordance with guidelines presented in ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The physical characteristics of the samples are noted and the field classifications are modified, where necessary, in accordance with ASTM terminology, though certain terminology that incorporates

current local engineering practice may be used. The term which best described the major portion of the sample is used to describe the soil type.'

Natural Moisture Content

Natural moisture content is determined in general accordance with guidelines presented in ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass. The natural moisture content is the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of solid particles.

Fines Content

Fines content testing is performed in general accordance with guidelines presented in ASTM D1140, *Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No.200) Sieve in Soils by Washing*. The fines content is the fraction of soil that passes the U.S. Standard Number 200 Sieve. This sieve differentiates fines (silt and clay) from sand and gravel. Soil material that remains on the Number 200 sieve is sand. Material that passes the sieve is fines. The test is used to refine soil type.

TRUE NORTH
GEOTECHNICAL
219 West 4th Street, Vancouver, WA
360-984-6584 - info@tnorthgeo.com

TABLE A1
Key to Exploration Logs - Terminology and Symbols

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTION
			GRAPHIC	GROUP	
Coarse Grained Soils: More Than 50% Material Retained on No. 200 Sieve	Gravel and Gravelly Soils: More Than 50% Coarse Fraction Retained on No. 4 Sieve	Clean Gravels (Little or No Fines)		GW	Well-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
				GP	Poorly-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		Gravels with Fines (Significant Percentage of FIne)		GM	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand and Sandy Soils: More Than 50% Coarse Fraction Passing No. 4 Sieve	Clean Sands (Little or No Fines)		SW	Well-graded Sands, Gravelly Sands, Little or No Fines
				SP	Poorly-graded Sands, Gravelly Sands, Little or No Fines
		Sands with Fines (Significant Percentage of FIne)		SM	Silty Sands, Sand-Silt Mixtures
				SC	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils: More Than 50% Material Passing No. 200 Sieve	Silts and Clays	Liquid Limit Less than 50 percent		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands, Clayey Silts
				CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays
				OL	Organic Silts and Organic Silty Clays of Low Plasticity
	Silts and Clays	Liquid Limit Greater than 50 percent		MH	Inorganic Silts Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH	Inorganic Clays of High Plasticity, Fat Clays
				OH	Organic Clays of Medium to High Plasticity, Organic Silts
Topsoil				TS	Topsoil, Humus, Duff or Peat (PT) Layers
Fill				F	Highly Variable Constituents
Bedrock				BR	Basalt, Sandstone, Shale, etc.

Relative Density of Coarse-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50+

▼	Observed Groundwater Elevation

Consistency of Fine-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 -8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	30 - 50
Very Hard	50+

True North Geotechnical
219 W. 4th Street Vancouver, WA 98660
Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-1

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0431-2
Latitude	: 45.63994	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.44693	Logged By	: LS	Project	: Landing at Green Mountain - Phase II
Ground Elevation	: 224 (ft)	Reviewed By	: TJN	Location	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 8 ft BGL	Date	: 12/16/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			CL-ML	Soft, dark brown, SILTY CLAY; rooted to 1 foot bgs; very moist.			0.5	
2	S1				24		0.75	
3							1.75	
▼				As above, but soft to medium stiff, dark brown with red mottling, wet.				
4			CL-ML					
5			SM	Medium dense, gray brown, SILTY SAND WITH GRAVEL; decreasing fines content with depth; wet.				
	S2				31	41		Infiltration testing attempted at 5.5 feet bgs
6	S3				33	30		
7								
	S4				31	36		
				Terminated due to refusal on boulders. Groundwater first encountered at 3.5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-2

UTM	: 10T	**Excavator**	: Link-Belt	**Job Number**	: 24-0431-2
Latitude	: 45.64119	**Excavator Supplier**	: Thompson Brothers Excavating	**Client**	: Pacific Lifestyle Homes
Longitude	: -122.44682	**Logged By**	: LS	**Project**	: Landing at Green Mountain - Phase II
Ground Elevation	: 240 (ft)	**Reviewed By**	: TJN	**Location**	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 8 ft BGL	**Date**	: 12/16/2024	**Loc Comment**	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1	S1		OL	Soft, gray, ORGANIC CLAY; wet.	39		0.5	
2 (▼)			SC	Soft to medium stiff, gray brown with red mottling, SANDY CLAY; wet.			0.5	
3							2.5	
	S2				36	52		
4							3.75	
5			SM	Medium dense, brown with red mottling, SILTY SAND; increasingly coarse with depth; wet.				
	S3				33	33		
6								
7								
	S4				32			
				Terminated due to refusal on boulders. Groundwater first encountered at 2 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-3

UTM	: 10T	**Excavator**	: Link-Belt	**Job Number**	: 24-0431-2
Latitude	: 45.64000	**Excavator Supplier**	: Thompson Brothers Excavating	**Client**	: Pacific Lifestyle Homes
Longitude	: -122.44616	**Logged By**	: LS	**Project**	: Landing at Green Mountain - Phase II
Ground Elevation	: 234 (ft)	**Reviewed By**	: TJN	**Location**	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 10 ft BGL	**Date**	: 12/16/2024	**Loc Comment**	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
0			ML	Soft, dark brown, SILT, some clay; very moist.				
1							0.5	
2	S1		CL-ML	Soft, brown with red mottling, SILTY CLAY WITH SAND; wet.	27		0.5	
3	S2		SC	Soft to medium stiff, brown with red mottling, SANDY CLAY WITH GRAVEL; wet.	32	56	1.0	
4							3.0	
5								
6								
7			SP	Medium dense, gray with red mottling, POORLY GRADED SAND; increasingly coarse with depth; wet.				
8	S3				37			
9								
	S4				37			
				Groundwater first encountered at 2.5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-4

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0431-2
Latitude	: 45.64097	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.44581	Logged By	: LS	Project	: Landing at Green Mountain - Phase II
Ground Elevation	: 246 (ft)	Reviewed By	: TJN	Location	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 9 ft BGL	Date	: 12/16/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Soft, dark brown, SILT, some clay; very moist.			0.5	
2				Soft to medium stiff, brown, SILTY CLAY; wet to very moist.			0.5	
3	S1		CL-ML		31	55	1.75	
4							2.25	
5	S2		SP	Gray-brown, POORLY GRADED SAND WITH GRAVEL; medium sized gravel; medium to coarse grained sand; wet.	33			
6								
7								
8	S3				46			
				Groundwater first encountered at 3.5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-5

UTM	: 10T	**Excavator**	: Link-Belt	**Job Number**	: 24-0431-2
Latitude	: 45.64172	**Excavator Supplier**	: Thompson Brothers Excavating	**Client**	: Pacific Lifestyle Homes
Longitude	: -122.44533	**Logged By**	: LS	**Project**	: Landing at Green Mountain - Phase II
Ground Elevation	: 253.58 (ft)	**Reviewed By**	: TJN	**Location**	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 9.5 ft BGL	**Date**	: 03/21/2025	**Loc Comment**	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Soft, dark brown, SILT; heavily rooted to 0.5 feet bgs; moist.				
2			SC	Soft to medium stiff, brown with gray and red mottling, Sandy CLAY; moist to wet.				
3 ▼	S1				35	68		
4								
5								
6								
7	S2		SM	Dense, brown with gray and red mottling, Silty SAND with cobbles and boulders; boulders up to 14 inches in diameter; moist to wet.	29	47		
8								
9	S3		GP-GC	Very dense, yellow brown, GRAVEL with Clay (weathered bedrock); moist to wet.	41			
				TP-5 Terminated at 9.5ft (Groundwater encountered at 3 feet bgs. Test pit backfilled with excavated soils and tamped to grade.)				

True North Geotechnical
219 W. 4th Street Vancouver, WA 98660
Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-6

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0431-2
Latitude	: 45.64090	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.44529	Logged By	: LS	Project	: Landing at Green Mountain - Phase II
Ground Elevation	: 245.31 (ft)	Reviewed By	: TJN	Location	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 8 ft BGL	Date	: 03/21/2025	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Soft, dark brown, SILT; heavily rooted to 0.75 feet bgs; moist.				
2			GM	Dense, gray brown, Silty GRAVEL; slightly moist to moist.				
3	S1				45			
4								
5								
6	S2				36	49		
7								
	S3		SC	Very dense, yellow gray, Clayey SAND with cobbles and boulders (weathered bedrock); moist to dry.	54			

TP-6 refusal at 8ft (Refusal at 8 feet bgs due to practical equipment failure. Groundwater not encountered. Test pit backfilled with excavated soils and tamped to grade.)

CLARK COUNTY WASHINGTON
PUBLIC HEALTH
www.clark.wa.gov
1601 E Fourth Plain Blvd, Bldg 17
PO Box 9825
Vancouver, WA 98666-8825
564.397.8000

June 13, 2025

Terry Emmert
22111 NE 28th St
Camas, WA 98607

RE: Conditional Development Review Evaluation for "The Landing at Green Mountain 2" located at 22111 NE 28th St, Camas (SR0070400; Tax Parcel 173177000, southern portion of 173210000; PA24-1018)

**** Final Health Department approval required****

Clark County Public Health (CCPH) completed the Development Review Evaluation for the site described above. This evaluation is limited to the area of the proposed development.

On-Site Sewage Systems (CCC 24.17, WAC 246-272A, CCC 40.370, RCW 58.17):

An existing individual on-site sewage system (OSS) is listed on the application and there are county records, ON0024900, showing an operational on-site sewage system is at the site. The single on-site sewage system consists of a septic tank east of the SE corner of the northern house, a septic tank on the southern side of the manufactured home (partially under the deck), and one drainfield south of the second tank with both tanks connected to it. A site visit on 05/08/25 did find obvious evidence of an on-site sewage system consistent with county records. Any on-site sewage system discovered during development must be properly abandoned with written notice provided to Clark County Public Health and shown on the final plat (Mylar).

This proposal excludes the residence and on-site sewage system ON0051473 on Parcel 173210000- only the southern portion of the parcel is proposed to be added to this project via boundary line adjustment. Records indicate that the septic tank is at the SE corner of the existing home and the drainlines extend west and south of the tank. If components of the on-site sewage system are found within 5' of the proposed property line, contact CCPH.

Please provide written notification describing the actions taken to legally abandon the system with pumper's receipt attached. Proper system abandonment requires tank pumping by a licensed pumper, removing the tank or breaking in the tank lids, punching a hole in the bottom, and filling the cavities with rock, sand or compacted soil. Cesspools, drywells, or pump chambers discovered during development must also be abandoned in this manner. Below is the link to a free document to document the OSS abandonment.

https://clark.wa.gov/sites/default/files/media/document/2024-01/CCPH%20OSS%20Abandonment%20Notification.pdf

The proposed development must connect to an approved public sewer system. A copy of the final acceptance letter from the sanitary sewer purveyor or the equivalent must be submitted along with the final plat (Mylar).

Water Systems (WAC 173-160, WAC 246-290, CCC 40.370, RCW 58.17):

An existing well is indicated on the application. There are county records WP0005167 indicating a well is at the site. A site visit on 05/08/25 did discover evidence of a well on the south side of a garage in a small concrete ring. Any wells identified during development must be properly decommissioned per WAC 173-160-381 by a Washington licensed well driller with written notice provided to Clark County Public Health and the well locations marked on the final plat (Mylar).

This proposal excludes the residence and the well WP0014301 on Parcel 173210000- only the southern portion of the parcel is proposed to be added to this project via boundary line adjustment. The well was identified to be in a shed north of the east end of the manufactured home. If the well is found to be within 5' of the property line, contact CCPH.

The proposed development must connect to an approved public water system. A copy of the final acceptance letter from the purveyor or the equivalent must be submitted along with the final plat (Mylar).

If you have any questions concerning this letter, please contact Clark County Public Health at (564) 397-7244.

Sincerely,

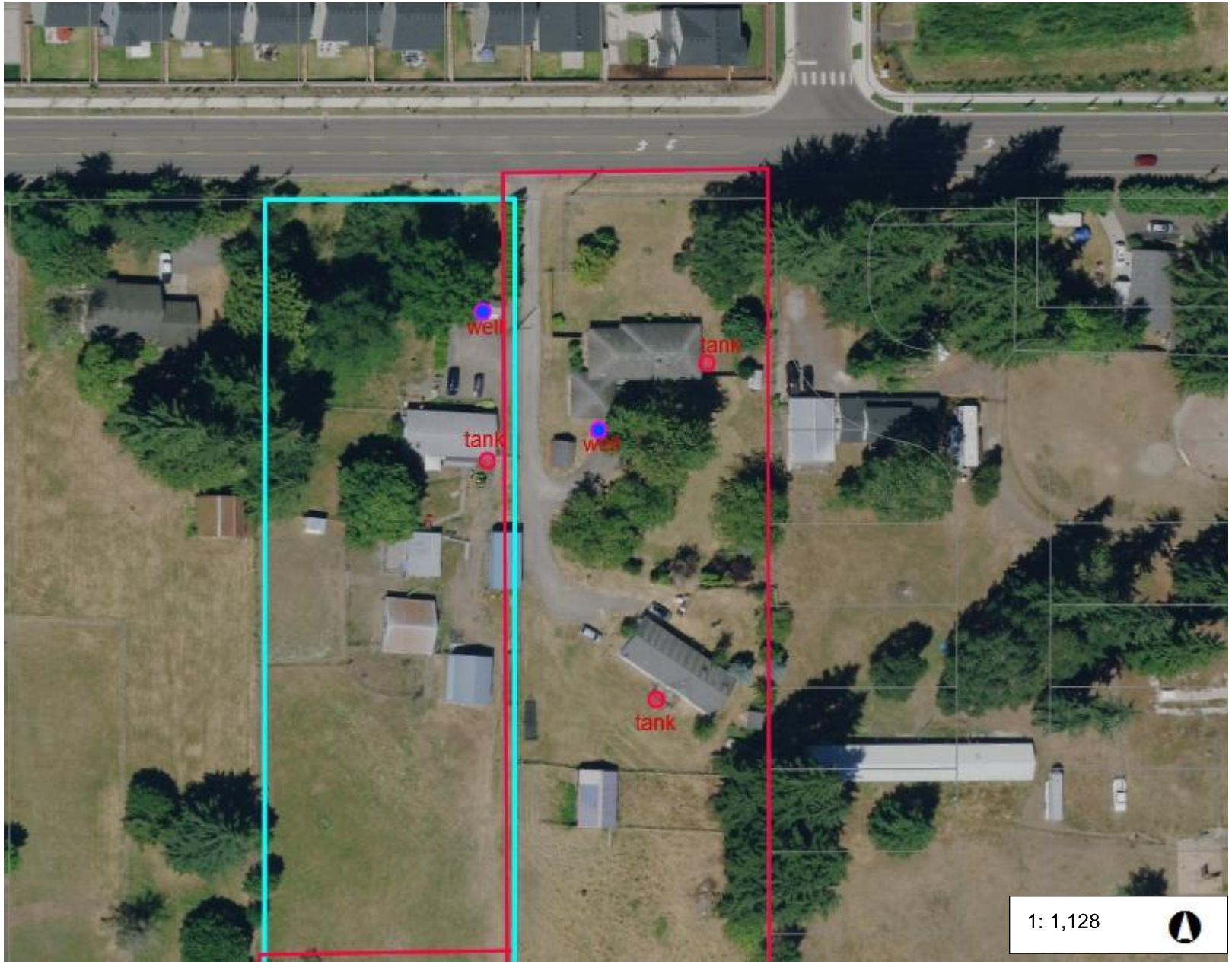
Jason Abraham

Digitally signed by Jason Abraham
Date: 2025.06.13 17:51:04 -07'00'

Environmental Health Specialist

CC: Lisa Harker, PLS Engineering
Lauren Hollenbeck, City of Camas Planning Division
Anita Ashton, City of Camas Engineering Division
Ahmed Yanka, City of Camas Engineering Division
Brian Smith, City of Camas Building Division

Well and septic tank locations





Legend

- Taxlots

Notes:

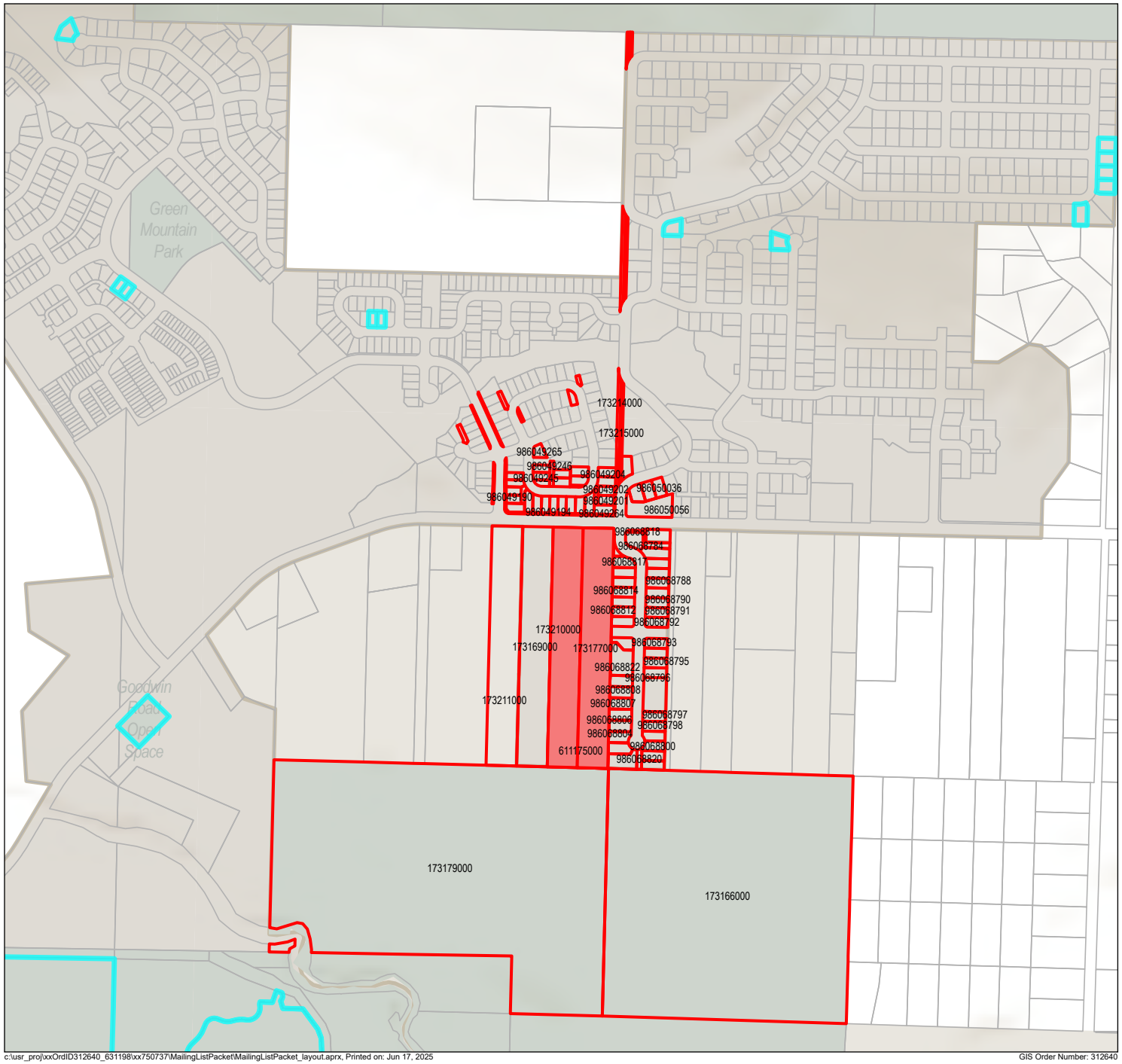
Proposed development within red boundary

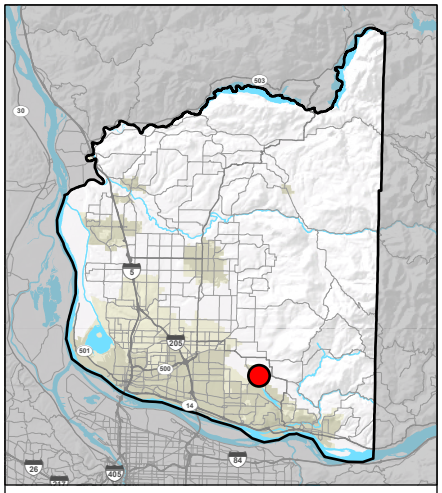
1: 1,128

188.0 0 94.00 188.0 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Taxlot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.





PID(s): 611175000, 173177000, 173210000,
300-Foot Buffer

KEY

- Subject Property
- Buffer Selection
- Parcels

CLARK COUNTY, WASHINGTON

N

NOTE: *Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.*

0 390 780 1,170 Feet

c:\usr_proj\xxOrdID312640_631198\xx750737\MailingListPacket\MailingListPacket_layout.aprx, Printed on: Jun 17, 2025

GIS Order Number: 312640

Owner Name	Mailing Address
AXMAKER ANDREW & AXMAKER HOLLY	8616 N WRIGHT ST, CAMAS, WA, 98607
BARROW ANSON DAVID & BARROW LAUNIE RAE	4331 SE 179TH CT, VANCOUVER, WA, 98683
BONIFE ANDREW W & BONIFE ANDREA FAITH	6252 N 86TH AVE, CAMAS, WA, 98607
BOUCHER RICHARD & BOUCHER KAREN TRUSTEES	8522 N HARGRAVE ST, CAMAS, WA, 98607
BUTTON SAUNDRA J & BUTTON COLTON L	6233 N 86TH AVE, CAMAS, WA, 98607
CLARK COUNTY PARKS	4700 NE 78TH ST, VANCOUVER, WA, 98665
DAHAL BIDHYA GURUNG & DAHAL LAXMI RAMAN	8602 N WRIGHT ST, CAMAS, WA, 98607
DEVERSDAL JENNIFER JEAN	8652 N APPLETON ST, CAMAS, WA, 98607
DOAN KHOA DANG & SAING STEPHANY SANPHILAY	8638 N WRIGHT ST, CAMAS, WA, 98607
DVERSDAL BETTY J TRUSTEE	8643 N WRIGHT ST, CAMAS, WA, 98607
ELZINGA DANIEL L & JACOBS ALEXANDRA	22007 NE 28TH ST, CAMAS, WA, 98607
EMMERT FAMILY III LLC	10470 SE HILLCREST DR, HAPPY VALLEY, OR, 97086
EMMERT TERRY W	11811 SE HWY 212, CLACKAMAS, OR, 97015
GME DEVELOPMENT LLC	1301 SE TECH CENTER DR STE 150, VANCOUVER, WA, 98683
GREEN MOUNTAIN ESTATES HOA	604 EVERGREEN BLVD, VANCOUVER, WA, 98660
GREEN MOUNTAIN PH2 SOUTH HOA	11807 NE 99TH ST STE 1170, VANCOUVER, WA, 98682
HENDERSON TYNAN & HENDERSON HOPE	22217 NE 28TH ST, CAMAS, WA, 98607
HERTENSTEIN SKIP & HERTENSTEIN MELISSA	21919 NE 28TH ST, CAMAS, WA, 98607
HO TUNG THANH & TRUONG LANH THI	8637 N APPLETON ST, CAMAS, WA, 98607
HOANG ALEXANDER TUNG & HIROMOTO KELBY AKEMI	6124 N 86TH AVE, CAMAS, WA, 98607
KUMMERMAN MICHAEL J & KUMMERMAN PAULINE VERONICA	6150 N 86TH AVE, CAMAS, WA, 98607
LUMLEY CORBEN & LUMLEY JENNIFER	6238 N 86TH AVE, CAMAS, WA, 98607
MADDOX NICK VANCE & MADDOX JENNIFER RACHELLE	8625 N APPLETON ST, CAMAS, WA, 98607
MERRITT GWENNA E	3602 NE 222ND AVE, CAMAS, WA, 98607
MERRITT ROCQUE & MERRITT SUE	3602 NE 222ND AVE, CAMAS, WA, 98607
MIDDAGH LINDA	22015 NE 28TH STREET, CAMAS, WA, 98607
MITTELSTAEDT PAUL E JR & MITTELSTAEDT ELIZABETH	6202 N 86TH AVE, CAMAS, WA, 98607
MOY JOHN C JR	1811 NW FOREST HOME LN, CAMAS, WA, 98607
MURPHY JOAN FRANCES TRUSTEE	8649 N APPLETON ST, CAMAS, WA, 98607
NEUDORFER KELSEY & BOCKELMAN EVAN	6226 N 86TH AVE, CAMAS, WA, 98607
PACIFIC LIFESTYLE HOMES INC	11815 NE 99TH ST STE 1200, VANCOUVER, WA, 98682
PETERS TRACY LYNN	8638 N APPLETON ST, CAMAS, WA, 98607
PRINS BRANDON O & PRINS LINDSEY N	8510 N HARGRAVE ST, CAMAS, WA, 98607
RADABAUGH CAROL L KVINGE	8024 N HARGRAVE ST, CAMAS, WA, 98607
RILER DANIEL JOSEPH & RILER MELINDA CATHERINE	8624 N WRIGHT ST, CAMAS, WA, 98607
RUTTER TROY EUGENE & RUTTER STEPHANIE DENISE	6138 N 86TH AVE, CAMAS, WA, 98607
SIMMONS KIESHA M & SIMMONS CHRISTOPHER R	17014 NE 6TH ST, VANCOUVER, WA, 98684
SMITH CHRISTOPHER CALVIN & SMITH MONIQUE MICHELLE	8613 N APPLETON ST, CAMAS, WA, 98607
STUDEMAN TYLER KASEY & STUDEMAN KELLY MARIE	6214 N 86TH AVE, CAMAS, WA, 98607
THE LANDING AT GREEN MOUNTAIN HOA	11815 NE 99TH ST STE 1200, VANCOUVER, WA, 98682
VACA DANIEL	6221 N 86TH AVE, CAMAS, WA, 98607
XU JIAN & LIANG YUEHAI TRUSTEES	12462 NW WAKER DR, PORTLAND, OR, 97229

Owner Name	Mailing Address

This document was created by the Clark County, Washington Geographic Information System

Number of Records 42
Number of Pages 2
Date Created 6/17/2025
Employee
Employee Name Jesse Manley

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

ELZINGA DANIEL L & JACOBS ALEXANDRA
22007 NE 28TH ST
CAMAS, WA 98607

HENDERSON TYNAN & HENDERSON HOPE
22217 NE 28TH ST
CAMAS, WA 98607

EMMERT FAMILY III LLC
10470 SE HILLCREST DR
HAPPY VALLEY, OR 97086

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

MIDDAGH LINDA
22015 NE 28TH STREET
CAMAS, WA 98607

HERTENSTEIN SKIP & HERTENSTEIN MELISSA
21919 NE 28TH ST
CAMAS, WA 98607

MERRITT ROCQUE & MERRITT SUE
3602 NE 222ND AVE
CAMAS, WA 98607

MERRITT GWENNA E
3602 NE 222ND AVE
CAMAS, WA 98607

EMMERT TERRY W
11811 SE HWY 212
CLACKAMAS, OR 97015

MURPHY JOAN FRANCES TRUSTEE
8649 N APPLETON ST
CAMAS, WA 98607

HO TUNG THANH & TRUONG LANH THI
8637 N APPLETON ST
CAMAS, WA 98607

MADDOX NICK VANCE & MADDOX JENNIFER RACHELLE
8625 N APPLETON ST
CAMAS, WA 98607

SMITH CHRISTOPHER CALVIN & SMITH MONIQUE MICHELLE
8613 N APPLETON ST
CAMAS, WA 98607

SIMMONS KIESHA M & SIMMONS CHRISTOPHER R
17014 NE 6TH ST
VANCOUVER, WA 98684

BONIFE ANDREW W & BONIFE ANDREA FAITH
6252 N 86TH AVE
CAMAS, WA 98607

LUMLEY CORBEN & LUMLEY JENNIFER
6238 N 86TH AVE
CAMAS, WA 98607

NEUDORFER KELSEY & BOCKELMAN EVAN
6226 N 86TH AVE
CAMAS, WA 98607

STUDEMAN TYLER KASEY & STUDEMAN KELLY MARIE
6214 N 86TH AVE
CAMAS, WA 98607

MITTELSTAEDT PAUL E JR & MITTELSTAEDT ELIZABETH
6202 N 86TH AVE
CAMAS, WA 98607

KUMMERMAN MICHAEL J & KUMMERMAN PAULINE VERONICA
6150 N 86TH AVE
CAMAS, WA 98607

RUTTER TROY EUGENE & RUTTER STEPHANIE DENISE
6138 N 86TH AVE
CAMAS, WA 98607

HOANG ALEXANDER TUNG & HIROMOTO KELBY AKEMI
6124 N 86TH AVE
CAMAS, WA 98607

DAHAL BIDHYA GURUNG & DAHAL LAXMI RAMAN
8602 N WRIGHT ST
CAMAS, WA 98607

BARROW ANSON DAVID & BARROW LAUNIE RAE
4331 SE 179TH CT
VANCOUVER, WA 98683

AXMAKER ANDREW & AXMAKER HOLLY
8616 N WRIGHT ST
CAMAS, WA 98607

RILER DANIEL JOSEPH & RILER MELINDA CATHERINE
8624 N WRIGHT ST
CAMAS, WA 98607

DOAN KHOA DANG & SAING STEPHANY SANPHILAY
8638 N WRIGHT ST
CAMAS, WA 98607

DVERSDAL BETTY J TRUSTEE
8643 N WRIGHT ST
CAMAS, WA 98607

XU JIAN & LIANG YUEHAI TRUSTEES
12462 NW WAKER DR
PORTLAND, OR 97229

VACA DANIEL
6221 N 86TH AVE
CAMAS, WA 98607

BUTTON SAUNDRA J & BUTTON COLTON L
6233 N 86TH AVE
CAMAS, WA 98607

PETERS TRACY LYNN
8638 N APPLETON ST
CAMAS, WA 98607

DEVERSDAL JENNIFER JEAN
8652 N APPLETON ST
CAMAS, WA 98607

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

MOY JOHN C JR
1811 NW FOREST HOME LN
CAMAS, WA 98607

BOUCHER RICHARD & BOUCHER KAREN TRUSTEES
8522 N HARGRAVE ST
CAMAS, WA 98607

PRINS BRANDON O & PRINS LINDSEY N
8510 N HARGRAVE ST
CAMAS, WA 98607

GME DEVELOPMENT LLC
1301 SE TECH CENTER DR STE 150
VANCOUVER, WA 98683

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

HENDERSON TYNAN & HENDERSON HOPE
22217 NE 28TH ST
CAMAS, WA 98607

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

RADABAUGH CAROL L KVINGE
8024 N HARGRAVE ST
CAMAS, WA 98607

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PID	Situs Address			
173166000			WA	0
173169000	22007 NE 28TH ST	CAMAS	WA	98607
173175000	22217 NE 28TH ST	CAMAS	WA	98607
173177000	22111 NE 28TH ST	CAMAS	WA	98607
173179000			WA	0
173210000	22015 NE 28TH ST	CAMAS	WA	98607
173211000	21919 NE 28TH ST	CAMAS	WA	98607
173214000			WA	0
173215000			WA	0
611175000	22111 NE 28TH ST	CAMAS	WA	98607
986049187	8649 N APPLETON ST	CAMAS	WA	98607
986049188	8637 N APPLETON ST	CAMAS	WA	98607
986049189	8625 N APPLETON ST	CAMAS	WA	98607
986049190	8613 N APPLETON ST	CAMAS	WA	98607
986049191	8601 N APPLETON ST	CAMAS	WA	98607
986049192	6252 N 86TH AVE	CAMAS	WA	98607
986049193	6238 N 86TH AVE	CAMAS	WA	98607
986049194	6226 N 86TH AVE	CAMAS	WA	98607
986049195	6214 N 86TH AVE	CAMAS	WA	98607
986049196	6202 N 86TH AVE	CAMAS	WA	98607
986049197	6150 N 86TH AVE	CAMAS	WA	98607
986049198	6138 N 86TH AVE	CAMAS	WA	98607
986049199	6124 N 86TH AVE	CAMAS	WA	98607
986049200	8602 N WRIGHT ST	CAMAS	WA	98607
986049201	8610 N WRIGHT ST	CAMAS	WA	98607
986049202	8616 N WRIGHT ST	CAMAS	WA	98607
986049203	8624 N WRIGHT ST	CAMAS	WA	98607
986049204	8638 N WRIGHT ST	CAMAS	WA	98607
986049239	8643 N WRIGHT ST	CAMAS	WA	98607
986049240	8631 N WRIGHT ST	CAMAS	WA	98607
986049241	6221 N 86TH AVE	CAMAS	WA	98607
986049242	6233 N 86TH AVE	CAMAS	WA	98607
986049245	8638 N APPLETON ST	CAMAS	WA	98607
986049246	8652 N APPLETON ST	CAMAS	WA	98607
986049263			WA	0
986049264			WA	0
986049265			WA	0
986050036	8538 N HARGRAVE ST	CAMAS	WA	98607
986050037	8522 N HARGRAVE ST	CAMAS	WA	98607
986050038	8510 N HARGRAVE ST	CAMAS	WA	98607
986050055	8509 N HARGRAVE ST	CAMAS	WA	98607
986050056			WA	0
986067854			WA	0
986068784	8400 N HARGRAVE ST	CAMAS	WA	98607
986068785	8380 N HARGRAVE ST	CAMAS	WA	98607

PID	Situs Address			
986068786	8358 N HARGRAVE ST	CAMAS	WA	98607
986068787	8322 N HARGRAVE ST	CAMAS	WA	98607
986068788	8304 N HARGRAVE ST	CAMAS	WA	98607
986068789	8298 N HARGRAVE ST	CAMAS	WA	98607
986068790	8282 N HARGRAVE ST	CAMAS	WA	98607
986068791	8260 N HARGRAVE ST	CAMAS	WA	98607
986068792	8238 N HARGRAVE ST	CAMAS	WA	98607
986068793	8190 N HARGRAVE ST	CAMAS	WA	98607
986068794	8178 N HARGRAVE ST	CAMAS	WA	98607
986068795	8156 N HARGRAVE ST	CAMAS	WA	98607
986068796	8134 N HARGRAVE ST	CAMAS	WA	98607
986068797	8046 N HARGRAVE ST	CAMAS	WA	98607
986068798	8024 N HARGRAVE ST	CAMAS	WA	98607
986068799	8002 N HARGRAVE ST	CAMAS	WA	98607
986068800	7974 N HARGRAVE ST	CAMAS	WA	98607
986068801	7952 N HARGRAVE ST	CAMAS	WA	98607
986068802	7930 N HARGRAVE ST	CAMAS	WA	98607
986068803	7981 N HARGRAVE ST	CAMAS	WA	98607
986068804	7995 N HARGRAVE ST	CAMAS	WA	98607
986068805	8021 N HARGRAVE ST	CAMAS	WA	98607
986068806	8043 N HARGRAVE ST	CAMAS	WA	98607
986068807	8065 N HARGRAVE ST	CAMAS	WA	98607
986068808	8087 N HARGRAVE ST	CAMAS	WA	98607
986068809	8119 N HARGRAVE ST	CAMAS	WA	98607
986068810	8189 N HARGRAVE ST	CAMAS	WA	98607
986068811	8241 N HARGRAVE ST	CAMAS	WA	98607
986068812	8263 N HARGRAVE ST	CAMAS	WA	98607
986068813	8285 N HARGRAVE ST	CAMAS	WA	98607
986068814	8301 N HARGRAVE ST	CAMAS	WA	98607
986068815	8317 N HARGRAVE ST	CAMAS	WA	98607
986068816	8325 N HARGRAVE ST	CAMAS	WA	98607
986068817	8365 N HARGRAVE ST	CAMAS	WA	98607
986068818			WA	0
986068819			WA	0
986068820			WA	0
986068821			WA	0
986068822			WA	0
986068823			WA	0

This document was created by the Clark County, Washington Geographic Information System

Number of Records 83
Number of Pages 3
Date Created 6/17/2025
Employee
Employee Name Jesse Manley

PID	Situs Address

Occupant PID 173169000
22007 NE 28TH ST
CAMAS, WA 98607

Occupant PID 173175000
22217 NE 28TH ST
CAMAS, WA 98607

Occupant PID 173177000
22111 NE 28TH ST
CAMAS, WA 98607

Occupant PID 173210000
22015 NE 28TH ST
CAMAS, WA 98607

Occupant PID 173211000
21919 NE 28TH ST
CAMAS, WA 98607

Occupant PID 611175000
22111 NE 28TH ST
CAMAS, WA 98607

Occupant PID 986049187
8649 N APPLETON ST
CAMAS, WA 98607

Occupant PID 986049188
8637 N APPLETON ST
CAMAS, WA 98607

Occupant PID 986049189
8625 N APPLETON ST
CAMAS, WA 98607

Occupant PID 986049190
8613 N APPLETON ST
CAMAS, WA 98607

Occupant PID 986049191
8601 N APPLETON ST
CAMAS, WA 98607

Occupant PID 986049192
6252 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049193
6238 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049194
6226 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049195
6214 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049196
6202 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049197
6150 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049198
6138 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049199
6124 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049200
8602 N WRIGHT ST
CAMAS, WA 98607

Occupant PID 986049201
8610 N WRIGHT ST
CAMAS, WA 98607

Occupant PID 986049202
8616 N WRIGHT ST
CAMAS, WA 98607

Occupant PID 986049203
8624 N WRIGHT ST
CAMAS, WA 98607

Occupant PID 986049204
8638 N WRIGHT ST
CAMAS, WA 98607

Occupant PID 986049239
8643 N WRIGHT ST
CAMAS, WA 98607

Occupant PID 986049240
8631 N WRIGHT ST
CAMAS, WA 98607

Occupant PID 986049241
6221 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049242
6233 N 86TH AVE
CAMAS, WA 98607

Occupant PID 986049245
8638 N APPLETON ST
CAMAS, WA 98607

Occupant PID 986049246
8652 N APPLETON ST
CAMAS, WA 98607

Occupant PID 986050036
8538 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986050037
8522 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986050038
8510 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986050055
8509 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068784
8400 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068785
8380 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068786
8358 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068787
8322 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068788
8304 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068789
8298 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068790
8282 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068791
8260 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068792
8238 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068793
8190 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068794
8178 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068795
8156 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068796
8134 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068797
8046 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068798
8024 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068799
8002 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068800
7974 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068801
7952 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068802
7930 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068803
7981 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068804
7995 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068805
8021 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068806
8043 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068807
8065 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068808
8087 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068809
8119 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068810
8189 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068811
8241 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068812
8263 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068813
8285 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068814
8301 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068815
8317 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068816
8325 N HARGRAVE ST
CAMAS, WA 98607

Occupant PID 986068817
8365 N HARGRAVE ST
CAMAS, WA 98607

Appendix C

Tree Plan

(Arbor Science Tree Care, June 2025)

ARBOR SCIENCE TREE CARE
SPECIALIZING IN SUSTAINABLE TREE CARE SOLUTIONS
arborsciencetreecare.com
360.521.0249
WA# ARBORST838DT OR CCB# 216351

June 28th 2025

Pacific Lifestyle Homes
1815 NE 99th St Vancouver WA 98682

The Landing At Green Mountain 2
22111 NE 28th St Camas WA 98607
Parcel # 173177000, 173210000

Re: Tree Survey per City of Camas CMC 18.13.045

Tree, Vegetation and Soil Protection During Construction.

During construction. Prior to initiating tree removal on the site, soils, vegetated areas and individual trees to be preserved shall be protected from potentially damaging activities pursuant to the following standards.

A. Placing Materials Near Trees. No person may conduct any activity within the protected area of any tree designated to remain, including, but not limited to, parking equipment, placing solvents, storing building material and soil deposits, dumping concrete washout and locating burn holes.

1. During construction, no person shall attach any object to any tree designated for protection.

B. Protective Barrier. Before development, land clearing, filling or any land alteration for which a tree is to be protected. The contractor
1. Shall erect and maintain readily visible protective tree fencing along the outer edge and completely surrounding the protected area of all protected trees or groups of trees that are to remain undisturbed. Fences shall be constructed of chain link and at least four feet high, unless other type of fencing is authorized by the planning official.

2.Shall prohibit excavation or compaction of earth or other potentially damaging activities within the barriers.

3. Shall maintain the protective barriers in place until the planning official authorizes their removal or a final certificate of occupancy is issued, whichever occurs first

4. Shall ensure that any landscaping done in the protected zone subsequent to the removal of the barriers shall be accomplished with light machinery or hand labor. No turf or lawn areas are to be installed within protected area.

5. In addition to the above, the planning official may require the following:

- Cover with mulch to a depth of at least six (6) inches or with plywood or similar material the areas adjoining the critical root zone of a tree in order to protect roots from damage caused by heavy equipment.

- Minimize root damage by excavating a two (2) foot deep trench, at edge of critical root zone, to cleanly sever the roots of trees to be retained.

- Have corrective pruning performed on protected trees in order to avoid damage from machinery or building activity.

- Maintain trees throughout construction period by watering and fertilizing if recommended by Arborist.

C. Grade.

1. The grade shall not be elevated or reduced within the critical root zone of trees to be preserved without the planning official's authorization. The planning official may allow coverage of up to one half of the area of the tree's critical root zone with light soils (no clay) to the minimum depth necessary to carry out grading or landscaping plans, if it will not imperil the survival of the tree. Aeration devices may be required to ensure the tree's survival.

2. If the grade adjacent to a preserved tree is raised such that it could slough or erode into the tree's critical root zone, it shall be permanently stabilized to prevent suffocation of the roots.

3. The applicant shall not install an impervious surface within the critical root zone of any tree to be retained without the authorization of the planning official. The planning official may require specific construction methods and/or use of aeration devices to ensure the tree's survival and to minimize the potential for root induced damage to the impervious surface.

4. To the greatest extent practical, utility trenches shall be located outside of the critical root zone of trees to be retained. The planning official may require that utilities be tunneled under the roots of

trees to be retained if the planning official determines that trenching would significantly reduce the chances of the tree's survival.

5. Trees and other vegetation to be retained shall be protected from erosion and sedimentation. Clearing operations shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, shrubs, ground cover and stumps shall be maintained on the individual lots, where feasible. Where not feasible appropriate erosion control practices shall be implemented pursuant to best management practices within industry standards.

D. Directional felling. Directional felling of trees shall be used to avoid damage to trees designated for retention and shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, shrubs, ground cover and stumps shall be retained where feasible. Where not feasible, appropriate erosion control practices shall be implemented pursuant to

E. Additional requirements. The planning official or Arborist may require additional tree, vegetation and soil protection measures which are consistent with accepted best management practices.

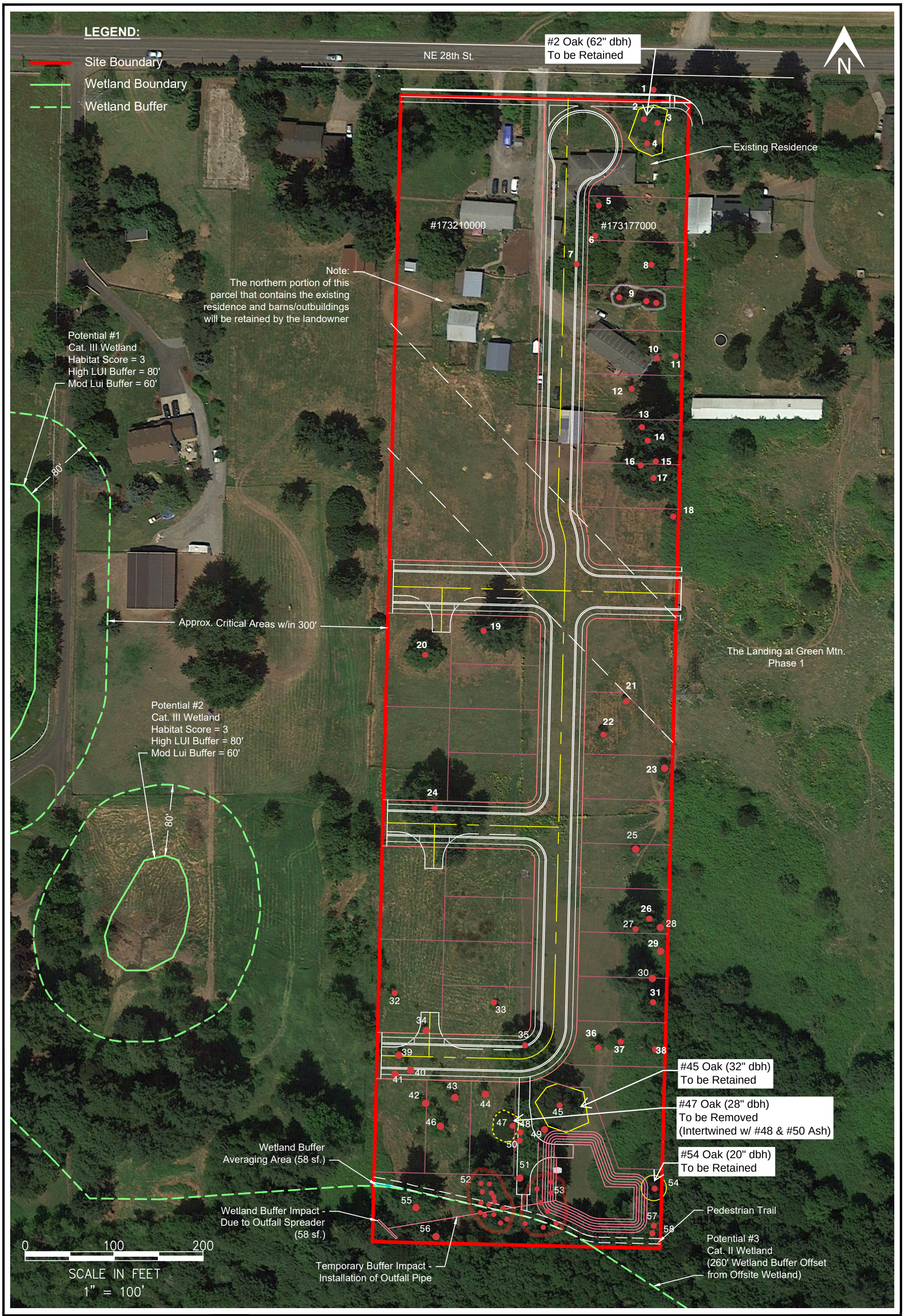
Tree Density Calculations:

Per City of Camas municipal code 18.13.045 this development requires 20 tree units per acre. The existing lot area is 9.59 acres, which has a density requirement of 191.8 tree units per acre. This proposed development retains 206 tree units to be preserved.
See attached map and table for tree detail and locations.

Prepared By Brandon Cheney
ISA Certified Arborist PN #7163A
TRAQ

Tree Number	Species	Common Name	DBH "	Retention Y/N	Condition	Tree Units
1	p. menziesii	Douglas-Fir	8	Y	Satisfactory	2
2	quercus	White Oak (multi stem)	62	Y	Satisfactory	26
3	p. menziesii	Douglas-Fir	52	Y	Satisfactory	22
4	cornus	Dogwood	9	Y	Satisfactory	2
5	acer	Bigleaf Maple	58	N	Fair	25
6	juglands	Black Walnut	31	N	Poor	12
7	juglands	Black Walnut	23	N	Fair	8
8	juglands	Black Walnut	24	N	Fair	8
9	prunus	(3 trees) Purple leaf plum	21	N	Fair	7
10	picea	Blue Spruce	9	N	Satisfactory	2
11	picea	Blue Spruce	9	N	Satisfactory	2
12	betula	(2 trees) Birch	8	N	Poor	2
13	p. menziesii	Douglas-Fir	46	N	Satisfactory	19
14	p. menziesii	Douglas-Fir	50	N	Satisfactory	21
15	p. menziesii	Douglas-Fir	46	N	Satisfactory	19
16	p. menziesii	Douglas-Fir	30	N	Satisfactory	11
17	p. menziesii	Douglas-Fir	41	N	Fair	17
18	acer	Bigleaf Maple (twin stem)	15	N	Poor	4
19	p. menziesii	Douglas-Fir	50	N	Fair	21
20	p. menziesii	Douglas-Fir	30	N	Dead	11
21	crataegus	Hawthorn	8	N	Satisfactory	2
22	fraxinus	Ash	8	N	Satisfactory	2
23	crataegus	Hawthorn	8	N	Satisfactory	2
24	fraxinus	Ash	24	N	Satisfactory	8
25	crataegus	Hawthorn	8	N	Satisfactory	2
26	p. menziesii	Douglas-Fir	46	N	Satisfactory	19
27	crataegus	Hawthorn	6	N	Satisfactory	2
28	quercus	White Oak	6	N	Fair	2
29	crataegus	Hawthorn	6	N	Satisfactory	2
30	p. menziesii	Douglas-Fir	50	N	Satisfactory	21
31	p. menziesii	Douglas-Fir	28	N	Poor	20
32	fraxinus	Ash	6	N	Satisfactory	2
33	fraxinus	Ash	6	N	Satisfactory	2
34	fraxinus	Ash	7	N	Satisfactory	2

Tree Number	Species	Common Name	DBH "	Retention Y/N	Condition	Tree Units
35	fraxinus	Ash (twin stem)	50	N	Satisfactory	21
36	fraxinus	Ash	10	N	Satisfactory	2
37	fraxinus	Ash (twin stem)	19	N	Satisfactory	6
38	salix	Willow	10	N	Poor	2
39	fraxinus	Ash (twin stem)	42	N	Satisfactory	17
40	fraxinus	Ash	7	N	Satisfactory	2
41	fraxinus	Ash	7	N	Satisfactory	2
42	fraxinus	Ash	9	N	Satisfactory	2
43	fraxinus	Ash	8	N	Satisfactory	2
44	fraxinus	Ash	10	N	Satisfactory	2
45	quercus	White Oak	32	Y	Satisfactory	12
46	fraxinus	Ash	7	N	Satisfactory	2
47	quercus	White Oak	28	N	Fair	10
48	fraxinus	Ash (twin stem)	33	N	Satisfactory	13
49	fraxinus	Ash (multi stem)	22	Y	Satisfactory	7
50	fraxinus	Ash (twin stem)	38	N	Fair	15
51	populas	Cottonwood	48	N	Satisfactory	20
52	populas	(14 tree grove) Cottonwood	188	Y	Satisfactory	90
53	populas	(8 tree grove) Cottonwood	116	N	Satisfactory	54
54	quercus	White Oak	20	Y	Fair	6
55	p. menziesii	Douglas-Fir	38	Y	Satisfactory	15
56	p. menziesii	Douglas-Fir	28	Y	Satisfactory	10
57	fraxinus	Ash	18	Y	Fair	5
58	fraxinus	Ash	25	Y	Fair	9



TREE PLAN

EXISTING CONDITIONS &
PROPOSED SITE PLAN

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain II
SITE LOCATION: 22015 & 22111 NE Goodwin Rd., Camas, WA

COUNTY: Clark **STATE:** ~~WA~~
FIGURE: 1
DATE: 6-24-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-061625.dwg

6039752 D
Total Pages:3 Rec: $205.50
eRecorded in Clark County, WA
4/20/2022 4:44 PM
First American Title – Vancouver

863555 - $10.00 - First American - Krysta Brixey - 04/20/2022

AFTER RECORDING MAIL TO:

Emmert Family III, LLC
10470 SE Hillcrest Dr
Happy Valley, OR 97086

Filed for Record at Request of:
First American Title Insurance Company

Space above this line for Recorders use only

QUIT CLAIM DEED

File No: **4211-3912650 (cd)** Date: **April 13, 2022**

Grantor(s): **Terry Emmert, an unmarried man**
Grantee(s): **Emmert Family III, LLC, an Oregon Limited Liability Company**
Abbreviated Legal: **PTN SEC 21 TWP 2N RGE 3E NE QTR SW QTR, CLARK COUNTY**
Additional Legal on page:
Assessor's Tax Parcel No(s): **173177000**

THE GRANTOR(S) Terry Emmert, an unmarried man for and in consideration of **no monetary consideration by mere change in identity** in hand paid, conveys and quit claims to **Emmert Family III, LLC, an Oregon Limited Liability Company**, the following described real estate, situated in the County of **Clark**, State of **Washington**, together with all after acquired title of the grantor(s) herein:

LEGAL DESCRIPTION: Real property in the County of Clark, State of Washington, described as follows:

PARCEL A:
THE EAST HALF OF THE EAST HALF OF THE EAST HALF OF THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 21, TOWNSHIP 2 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN CLARK COUNTY, WASHINGTON.

EXCEPT ANY PORTION LYING WITHIN NE 28TH STREET.

ALSO EXCEPT THAT PARCEL OF LAND LOCATED IN A PORTION OF THE EAST HALF OF THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 21, TOWNSHIP 2 NORTH, RANGE 3 EAST, OF THE WILLAMETTE MERIDIAN, CLARK COUNTY, WASHINGTON, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A CLARK COUNTY CONCRETE MONUMENT WITH A BRASS CAP MARKING THE FAST QUARTER CORNER OF SECTION 21 AS SHOWN IN BOOK 50 OF SURVEYS, PAGE 069, CLARK COUNTY AUDITOR'S RECORDS; THENCE NORTH 88°42'49" WEST, 2627.89 FEET TO THE NORTHEAST CORNER OF THE SOUTHWEST QUARTER OF SECTION 21; THENCE SOUTH 01°2720" WEST ALONG THE EAST LINE OF THE

Non-Order Search
Doc: WACLAR:6039752
Page 1 of 3
Requested By: Jake.Mensinger1, Printed: 8/14/2024 3:24 PM

SOUTHWEST QUARTER OF SECTION 21 FOR A DISTANCE OF 30.00 FEET TO THE NORTHEAST CORNER OF THE "MERRILL PARCEL" AS DESCRIBED UNDER CLARK COUNTY AUDITOR'S FILE NO. G 129359, SAID POINT ALSO BEING ON THE SOUTHERLY RIGHT OF WAY LINE OF NORTHEAST TWENTY-EIGHTH STREET AND THE TRUE POINT OF BEGINNING; THENCE NORTH 88°42'45" WEST, ALONG THE NORTH LINE OF THE "MERRILL PARCEL" AND SAID SOUTHERLY RIGHT OF WAY LINE FOR A DISTANCE OF 4.00 FEET; THENCE LEAVING THE NORTH LINE OF SAID "MERRILL PARCEL" AND SAID SOUTHERLY RIGHT OF WAY LINE, SOUTH 01°27'20: WEST, PARALLEL TO THE EAST LINE OF THE SOUTHWEST QUARTER FOR A DISTANCE OF 1290.18 FEET TO A POINT ON THE SOUTH LINE OF THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 21, SAID POINT BEARS NORTH 88°36'48" WEST, 4.00 FEET FROM THE SOUTHEAST CORNER OF SAID "MERRILL PARCEL"; THENCE SOUTH 88°36'48" EAST, 4.00 FEET TO THE SOUTHEAST CORNER OF SAID "MERRILL PARCEL", SAID POINT ALSO BEING THE SOUTHWEST CORNER OF THE "BOWERS PARCEL", AND THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 21; THENCE NORTH 01°27'20" EAST, 1290.19 FEET TO THE TRUE POINT OF BEGINNING.

PARCEL B:
A PARCEL OF LAND LOCATED IN A PORTION OF THE EAST HALF OF THE NORTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 21, TOWNSHIP 2 NORTH, RANGE 3 EAST, OF THE WILLAMETTE MERIDIAN, CLARK COUNTY, WASHINGTON, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A CLARK COUNTY CONCRETE MONUMENT WITH A BRASS CAP MARKING THE EAST QUARTER CORNER OF SECTION 21 AS SHOWN IN BOOK 50 OF SURVEYS, PAGE 069, CLARK COUNTY AUDITOR'S RECORDS; THENCE NORTH 88°42'49" WEST, 2627.89 FEET TO THE NORTHEAST CORNER OF THE SOUTHWEST QUARTER OF SECTION 21; THENCE SOUTH 01°27'20" WEST ALONG THE EAST LINE OF THE SOUTHWEST QUARTER OF SECTION 21 FOR A DISTANCE OF 30.00 FEET TO THE NORTHEAST CORNER OF THE "MERRILL PARCEL" AS DESCRIBED UNDER CLARK COUNTY AUDITOR'S FILE NO. G 129359, SAID POINT ALSO BEING ON THE SOUTHERLY RIGHT OF WAY LINE OF NORTHEAST TWENTY-EIGHT STREET: THENCE NORTH 88°42'45" WEST, ALONG SAID SOUTHERLY RIGHT OF WAY LINE FOR A DISTANCE OF 164.21 FEET TO THE NORTHWEST CORNER OF SAID "MERRILL PARCEL" AND THE TRUE POINT OF BEGINNING; THENCE LEAVING SAID SOUTHERLY RIGHT OF WAY LINE, SOUTH 01°26'31" WEST, 1289.90 FEET THE SOUTHWEST CORNER OF SAID "MERRILL PARCEL" SAID POINT ALSO BEING THE SOUTHEAST CORNER OF THE "MIDDAGH PARCEL"; THENCE LEAVING THE WEST LINE OF SAID "MERRILL PARCEL" NORTH 88°36'48" WEST, ALONG THE SOUTH LINE OF SAID MIDDAGH PARCEL" FOR A DISTANCE OF 3.00 FEET; THENCE LEAVING THE SOUTH LINE OF SAID "MIDDAGH PARCEL" NORTH 01°26'31" EAST, PARALLEL TO THE WEST LINE OF SAID "MERRILL PARCEL" FOR A DISTANCE OF 1289.90 FEET TO A POINT OF THE SOUTHERLY RIGHT OF WAY LINE OF NE 28TH STREET, SAID POINT BEARS NORTH 88°42'45" WEST, 3.00 FEET FROM THE NORTHWEST CORNER OF SAID "MERRILL PARCEL"; THENCE SOUTH 88°42'45" EAST, 3.00 FEET TO THE TRUE POINT OF BEGINNING.

EXCEPT ANY MOBILE HOME/MANUFACTURED HOME LOCATED UPON SAID PREMISES.

Terry Emmert

STATE OF ~~Washington~~ Oregon)
)-ss.
COUNTY OF ~~Clark~~ Clackamas)

This record was acknowledged before me on 4/15/2022 by **Terry Emmert**.

Notary Public
My commission expires: 7/14/23

OFFICIAL STAMP
DEBBY BOE
NOTARY PUBLIC - OREGON
COMMISSION NO. 989503
MY COMMISSION EXPIRES JULY 14, 2023

5037748 D
RecFee - $73.00 Pages: 2 - JONER BAKER PLLC
Clark County, WA 12/13/2013 12:23

7033407033341
Real Estate Excise Tax
Ch. 11 Rev. Laws 1951
EXEMPT
Affd. # Date 12.13.13
For Details of tax paid see
Affd. #
Doug Lasher
Clark County Treasurer
By Deputy

WHEN RECORDED RETURN TO:
Linda R. Middagh
22015 NE 28th Street
Camas, WA 98607

Quit Claim Deed

Grantor:	Kevin N. Middagh 2828 NE Everett Street, Unit I Camas, WA 98607
Grantee:	Linda R. Middagh 22015 NE 28th Street Camas, WA 98607
Abbreviated Legal:	#12 SEC 21, T2N R3EWM
Assessor's Tax Parcel No.	173210000

Documentary transfer tax is none. No consideration.

THE GRANTOR, KEVIN N. MIDDAGH, hereby releases, quitclaims, grants and conveys to:

GRANTEE, LINDA R. MIDDAGH, the hereafter-described real estate situated in the County of Clark, State of Washington, including any interest therein which Grantor may hereafter acquire:

> The West Half of the East Half of the East Half (West Half of the East Half of the East Half) of the Northeast Quarter of the Southwest Quarter of Section 21, Township 2 North, Range 3 East of the Willamette Meridian, Clark County, Washington. Except County Roads. Includes a 1989 Fleetwood Manufactured Home, Serial AFLK31A08649WC, plate #10948.

Subject to all easements, rights-of-way, protective covenants and mineral reservations of record, if any.

To have and to hold same unto Grantee and unto Grantee's heirs and assigns forever, with all appurtenances thereunto belonging.

DATED this the 21 day of October, 2013.

SIGNED
Kevin N. Middagh

STATE OF WASHINGTON

COUNTY OF CLARK

I certify that I know or have satisfactory evidence that KEVIN N. MIDDAGH is the person who appeared before me, and said person acknowledged that he signed this instrument and acknowledged it to be his free and voluntary act for the uses and purposes mentioned in this instrument.

SWORN TO AND SUBSCRIBED before me, this the 21st day of Oct, 2013.

NOTARY PUBLIC
STATE OF WASHINGTON
AMBER L. PRITCHARD
MY COMMISSION EXPIRES
OCTOBER 1, 2015

Amber L. Pritchard, Notary Public

My Commission Expires Oct 1, 2015

CRITICAL AREAS REPORT

& MITIGATION PLAN

Project:

The Landing at Green Mountain – Phase II

Applicant:

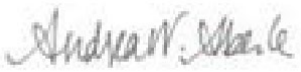
Pacific Lifestyle Homes
11815 NE 99th Street,
Vancouver WA, 98682

Prepared By:

Ash ECO SOLUTIONS, LLC

July 1, 2025

The information in this report was compiled to meet the requirements of the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. This report has been prepared under the supervision and direction of the undersigned, a qualified professional following CMC Section 16.61.020.A.



Andrea W. Aberle, Sr. Biologist
AshEco Solutions, LLC

SITE INFORMATION:

Parcel No(s):	173177000
Acreage:	4.83 acres
Local Jurisdiction:	City of Camas, Washington
Section/Township/Range:	SW¼, S21, T2N, R3E, W.M.
Site Address:	22111 NE 28th Street Camas, WA 98607
Legal Landowner:	Emmert Family III LLC *(Per Current GIS Parcel Info)*

Parcel No(s):	173210000
Acreage:	4.91 acres
Local Jurisdiction:	City of Camas, Washington
Section/Township/Range:	SW¼, S21, T2N, R3E, W.M.
Site Address:	22015 NE 28th Street Camas, WA 98607
Legal Landowner:	Linda Middagh *(Per Current GIS Parcel Info)*

TABLE OF CONTENTS

INTRODUCTION 1
Project Description 1
Project Location and Background Information 1
EXISTING CONDITIONS 1
CRITICAL AREAS MAP RESEARCH 1
Topography 1
Soil Survey 1
Wetlands 2
WDFW Priority Habitat 2
METHODOLOGY 3
Wetlands 3
WDFW Priority Habitat 3
Habitats of Local Importance 4
DOCUMENTED VEGETATION 4
CRITICAL AREA CONCLUSIONS 5
Wetlands 5
Wetland Buffers 5
WETLAND BUFFER MITIGATION PLAN 6
Avoidance & Minimization 6
Wetland conclusions 7
WDFW PRIORITY HABITAT 7
Habitats of Local Importance 7
OREGON WHITE OAK MITIGATION PLAN 8
Avoidance and Minimization 8
OAK MITIGATION PLANTING PLAN 10
Site Preparation 10
Planting Methods 10
Planting Specifications 10
Protective Signage 11
Maintenance Plan 11
Monitoring Plan 11
Monitoring Report Contents 12
Contingency Plan 12

Site Protection **12**

MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS **12**

DISCLAIMER **13**

REFERENCES **14**

TABLES

Table 1. Critical Areas Summary 5
Table 2. Wetland Buffer Impacts and Mitigation Summary 7
Table 3. Oregon White Oak Summary 8
Table 4. Oak Impacts & Mitigation Summary 10
Table 5. Oak Mitigation Planting Plan 11

FIGURE SET

Figure 1 – Vicinity Map
Figure 2 – Aerial Photo & Topography Map
Figure 3 – Soil Survey & National Wetlands Inventory (NWI) Map
Figure 4 – Riparian Habitat & Species Map
Figure 5 – Washington Dept. of Fish & Wildlife (WDFW) Priority Habitat & Species (PHS) Map
Figure 6 – Existing & Proposed Conditions Map

APPENDICES

Appendix A – Site Photos
Appendix B – Wetland Rating Forms
Appendix C – Tree Plan (Arbor Science Tree Care, June 2025)

INTRODUCTION

Project Description

AshEco Solutions, LLC (AES) was contracted by Pacific Lifestyle Homes (PLH) to assess the potential critical areas located within a study area comprised of two subject parcels and areas immediately offsite to the south. This Critical Areas Report and Buffer Plan follows the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. PLH proposes construction of a residential subdivision within two parcels of land totaling 9.74-acres. The existing single-family residences located near NE 28th Avenue will remain and are not part of the proposed project.

Project Location and Background Information

The study area consists of two subject parcels addressed as 22111 NE 28th Street and 22015 NE 28th Street, Camas, Washington (Figure 1). The parcels are under the jurisdiction of the City of Camas and are assigned Parcel Numbers 173177000 and 173210000. East of the subject parcels is The Landing at Green Mountain – Phase I residential subdivision. To the west are large lot residential properties. To the north , north of NE 28th are urban residential lots and south of the property is forest park land owned by Clark County.

EXISTING CONDITIONS

The topography onsite and within the vicinity of the study area, slopes in elevation from the highest point along NE 28th Street in the north to the south/southwest. Seasonal hydrology ultimately flows offsite and southwest to the valley floor to the Lacamas Creek corridor. A maintained overhead BPA powerline easement that is 100 feet in width bisects the study area diagonally east/west.

Since at least the 1970s both subject parcels within the study area have had single-family residential use in the north and agricultural uses in the central and southern areas. The study area is generally dominated by open pasture areas with scattered native and non-native trees. Little native understory exists within the bulk of the study area due to a history of grazing of the open pastures and maintained lawn present surrounding the residences. Trees that are concentrated within the study area are located in the vicinity of the southern parcel boundaries, adjacent to forest land owned by Clark County. It should be noted that a series of trails and a maintained access/logging road is present to the south on the county property with connection ultimately south to Lacamas Lake and Camp Currie park lands.

CRITICAL AREAS MAP RESEARCH

Topography

The localized topography as depicted by Clark County GIS generally depicts a south facing slope on a terrace above the Lacamas Creek valley. The topography elevation contours mapped indicate that elevations drop approximately 50 feet from the highest elevation near NE 28th Street in the north to the lowest elevation in the southwest corner of Parcel 173210000 (Figure 2).

Soil Survey

Soils within the subject parcel are mapped by the NRCS USDA Soil Conservation Service, Soil Survey of Clark County Washington (1972), as Lauren gravelly loam, 0 to 8 percent slopes (LgB), Lauren loam, 0 to 8 percent slopes (LeB), and McBee silt loam, 0 to 3 percent slopes (MIA) (Figure 3).

The Lauren series consists of deep, somewhat excessively drained, nearly level to gently sloping soils on terraces 50 to 300 feet above the Columbia River. In a few places, on terrace fronts, the soils are steep to very steep. These are very gravelly soils that formed in mixed Columbia River alluvium that contained some

volcanic ash. Typically, native vegetation occurring within this soil series is comprised Douglas-fir, grand fir, bigleaf maple, vine maple, salal, and ferns.

Lauren gravelly loam, 0 to 8 percent slopes (LgB) occurs on terraces. The slopes are generally less than 4 percent and approach 8 percent only along the terrace breaks. In a typical profile the surface layer is very dark brown gravelly and very gravelly loam about 20-inches thick. Below the surface layer is friable, dark- brown very gravelly loam about 13-inches thick. The next layer is dark-brown very gravelly coarse sandy loam about 11-inches thick. The underlying material, to a depth of 70-inches, is dark-brown very gravelly loamy coarse sand. Included in mapping were a few small areas where very gravelly loamy coarse sand is within 30-inches of the surface. Permeability generally is moderately rapid, but it is rapid in the substratum. The available water capacity is moderate. Surface runoff is slow, and the erosion hazard is slight. The LgB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Lauren loam, 0 to 8 percent slopes (LeB) is similar to Lauren gravelly loam, 0 to 8 percent slopes, except that the surface layer is free of gravel. Surface runoff is slow, and the erosion hazard is slight. Included in mapping were a few small gravelly areas. The LeB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

The McBee series consists of deep, somewhat poorly drained and moderately well drained, nearly level to gently sloping soils. These are loamy soils in back-bottom positions along streams and rivers. They formed in alluvium derived from quartzite and basalt. Typically, native vegetation is western redcedar, hemlock, vine maple, red alder, Oregon ash, wild rose, spirea, willow, blackberry, grasses, and sedges.

McBee silt loam, 0 to 3 percent slopes (MlA), occurs in drainageways and depressions, and in most places the slope is less than 1 percent. In a typical profile the surface layer is mottled, very dark brown silt loam about 11 inches thick. Below the surface layer is friable, mottled, dark-brown heavy loam about 8 inches thick. The next layer, to a depth of 44 inches, is mottled, very dark grayish-brown gravelly sandy loam. Below this, to a depth of 62 inches, is dark-brown very gravelly loamy sand. Typically, there is no erosion hazard with this soil type. This soil is somewhat poorly drained, surface runoff is very slow, with water standing on the surface much of the winter in undrained areas. The MlA soil type is listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Mapped hydric soils do not necessarily mean that the area is a wetland; hydrology and wetland vegetation must be present to classify an area as a wetland. The same is true for soils that are not mapped as hydric. Wetlands can be found in areas without mapped hydric soils.

Wetlands

Clark County GIS Maps Online does not map wetland presence within the study area, nor does the National Wetland Inventory (NWI) (Figure 3). AshEco Solutions (AES) reconnaissance of the subject parcels confirmed that wetlands are not located within the subject parcels as indicated by Clark County GIS and NWI mapping.

WDFW Priority Habitat

Clark County GIS and the Washington Department of Fish and Wildlife (WDFW) map individual Oregon white oak trees within and adjacent to the subject parcels (Figures 4 and 5). AES identified three individual Oregon white oak trees onsite, one within the far northeast corner of the study area and two in the far southeast corner (Figure 6).

WDFW also indicates that “Cave or Cave-rich Areas” occur within the general area surrounding the subject

parcels, though no evidence of caves or rock outcroppings were identified onsite by AES during site reconnaissance.

METHODOLOGY

Wetlands

The study area and immediate offsite vicinity was evaluated for the presence of wetlands using the Routine Determination Method per the U.S. Army Corps of Engineers' (USACE's) *Wetland Delineation Manual* (1987), the *Washington State Wetlands Identification and Delineation Manual* (1997), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, Version 2.0* (USACE 2010). The Routine Determination Method examines three parameters to determine if wetlands exist in a given area: vegetation, hydrology, and soils. The presence of hydrology is critical in identifying wetlands; however, since hydrologic conditions can change periodically (hourly, daily, or seasonally), it is necessary to determine if hydrophytic vegetation and hydric soils are also present. By definition, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are regulated as "Waters of the United States" by the USACE, "Waters of the State" by Washington State Department of Ecology (ECY), and locally by CMC section 16.53 Wetlands.

AES did not identify wetlands within the study area. However, AES did perform reconnaissance offsite from the southern study area limits (for this project and an adjacent project) and identified a forested wetland unit (Potential Wetland #3) offsite to the southwest. Using aerial imagery AES approximated two additional offsite wetlands west of the site (Figure 6). These approximate wetland limits are presented by this report following CMC 16.53.030(B)(2).

WDFW Priority Habitat

The WDFW PHS system maps individual Oregon white oak trees onsite and adjacent to the eastern subject parcel. AES inventoried the Oregon white oaks present onsite.

WDFW defines Oregon white oak Priority Habitat as; Oregon White Oak Woodlands are "*stands of oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%; or where total canopy coverage of the stand is <25%, but oak accounts for at least 50% of the canopy coverage. The latter is often referred to as oak savanna. In non-urbanized areas west of the Cascades, priority oak habitat consists of stands > 0.4 ha (1.0 ac) in size. East of the Cascades, priority oak habitat consists of stands > 2 ha (5 ac) in size. In urban or urbanizing areas, single oaks or stands < 0.4 ha (1 ac) may also be considered a priority when found to be particularly valuable to fish and wildlife (i.e., they contain many cavities, have a large diameter at breast height [dbh]* (generally 20-inches dbh and greater)*, are used by priority species, or have a large canopy). Oak woodlands in western Washington may contain understory plants indicative of Prairie*."

Individual Oregon white oak trees meeting the above definition were identified within or immediately adjacent to the subject parcel (Figure 6). The subject site is within an incorporated city and is urban, therefore the individual Oregon white oak trees are considered Priority Habitat by WDFW. The project does not propose impacts to the onsite oaks, as the project has been designed to retain all onsite oaks (Figure 6).

The WDFW PHS system maps "Cave or Cave-rich Areas" present in areas surrounding the subject parcel (Figure 5).

WDFW defines Caves as, *"A naturally occurring cavity, recess, void, or system of interconnected passages (including associated dendritic tubes, cracks, and fissures) which occurs under the earth in soils, rock, ice, or other geological formations, and is large enough to contain a human. Mine shafts (a human-made excavation in the earth usually used to extract minerals) may mimic caves and abandoned mine shafts with actual or suspected occurrences of priority species should be treated in a manner similar to caves."*

No caves or rock outcroppings meeting the above definition were identified within the study area or immediately offsite.

Habitats of Local Importance
Following CMC Chapter 16.61 - Fish And Wildlife Habitat Conservation Areas, Section: 16.61.010.A.3.a, individual Oregon white oak trees with a twenty-inch diameter at breast height (20-inches dbh), stands of Oregon white oak trees greater than one acre when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height, are used by priority species, or have a large canopy), and all Oregon white oak snags unless determined by an arborist to be a hazard, are considered Habitats of Local Importance and therefore are regulated by CMC.

DOCUMENTED VEGETATION

The vegetation onsite has been disturbed by equestrian use and historic mowing activities, with non-native and invasive grasses and herbs dominate throughout areas historically grazed within the northern and central sections of the parcel. A few individual scattered trees are present onsite including Douglas-fir (*Pseudotsuga menzisii,* FACU) and Oregon white oak (*Quercus garryana* ,FACU).

South of the subject parcel is a forested wetland mosaic area owned by Clark County. This area is much more biologically diverse and slightly overlaps with onsite areas along the southern parcel boundary and corners. Upland vegetation identified in this area includes Douglas-fir (*Pseudotsuga menzisii* FACU), Oregon white oak (*Quercus garryana* FACU), and Oregon ash (*Fraxinus latifolia* FACW) in the overstory with vine maple (*Acer circinatum* FAC), beaked hazelnut (*Corylus cornuta* FACU), snowberry (*Symphoricarpos albus* FACU), red osier dogwood (*Cornus sericea* FACW), trailing blackberry (*Rubus ursinus* FACU) and salmonberry (*Rubus spectabilis* FAC) in the shrub stratum and sword fern (*Polystichum munitum* FACU), piggy-back plant (*Tolmiea menzisii* FAC), lanceleaf spring beauty (*Claytonia lanceolata* FAC), dovefoot geranium (*Geranium mole* FACU), large leaf avens (*Geum macrophyllum* FACW), and slough sedge (*Carex obnupta* OBL) in the herbaceous stratum.

The indicator categories following the common and scientific name of each vegetation species indicate the likelihood of the species to be found in wetlands. Listed from most-likely to least-likely to be found in wetlands, the indicator categories are:

- **OBL (obligate wetland) –** Occur almost always under natural conditions in wetlands.
- **FACW (facultative wetland) –** Usually occur in wetlands but occasionally found in non-wetlands.
- **FAC (facultative) –** Equally likely to occur in wetlands or non-wetlands.
- **FACU (facultative upland) –** Usually occur in non-wetlands but occasionally found in wetlands.
- **UPL (obligate upland) –** Occur almost always under natural conditions in non-wetlands.
- **NI (no indicator) –** Insufficient data to assign to an indicator category.

CRITICAL AREA CONCLUSIONS

Wetlands

Offsite wetland reconnaissance by AES identified a high-quality forested wetland (potential wetland #3) offsite and southwest of the study area (Figure 6). Potential wetland #3 was rated under the Depressional Hydrogeomorphic Classification (HGM) and is considered a Category II wetland scoring high for habitat functions with a score of 8 (Appendix B). Potential wetland #3 has both slope and depressional HGM features. Under the Washington wetland rating system, wetlands with both slope and depressional features are rated under the depressional HGM classification. This high functioning wetland will require a buffer width that will encroach into the study area, thus it is the focus wetland for this report. See Wetland Buffer information presented below.

Using aerial imagery, AES approximated the boundaries of two potential offsite wetlands located west of the site (Figure 6). The offsite potential wetland (#1) west of the study area western boundary was rated under the Depressional HGM classification as it appears to consist of a shallow depressional area located on a gentle slope. The offsite potential wetland (2) was also rated under the Depressional HGM as it appears to consist of a depressional pond area. Both offsite potential wetlands resulted in Category III wetland ratings with low habitat function scores of 3 (Figure 6 and Appendix B). These wetlands will not require large buffers that will encroach into the study area.

Wetland Buffers

Under the Camas Municipal Code (CMC), wetland buffer widths are established by comparing the wetland rating habitat function score and overall category, and the intensity of proposed land use. Under CMC Table 16.53.040-4 residential use with density higher than 1-unit per acre is considered High Land Use Intensity (LUI). The proposed single family residential subdivision will match the current zoning, Single-Family Residential (R-7.5) of the subject parcels comprising a total of 9.74 acres. The proposed density of the subdivision meets the definition of High LUI under the CMC. Under CMC Table 16.53.040-2, Category II wetlands with a habitat function score of 8 adjacent to proposed High LUI require 260-foot buffers, 195-foot buffers for Moderate LUI, and 130-foot buffers for Low LUI. Under CMC Table 16.53.040-1, Category III wetlands with a habitat function score of 3 adjacent to proposed High LUI require 80-foot buffers.

The 260-foot buffer of the potential offsite wetland #3 encroaches over the southwestern corner of the site. The 80-foot buffer for the Category III wetlands offsite to the west (#1 and #2) will not encroach over the western boundary of the subject parcel (Figure 6).

WDFW Priority Habitat

A total of five individual Oregon white trees were identified onsite, four of them meeting the jurisdictional criteria (Figure 6, Table 3). Oregon white oaks are protected by WDFW and also jurisdictional under the local CMC habitat code. The understory and herbaceous layer associated with the onsite oak habitat is highly disturbed due to cattle grazing, mowing and areas dominated by Himalayan blackberry. The project has been designed to avoid and retain three of the four jurisdictional Oregon white oaks onsite (Figure 6).

Table 1. Critical Areas Summary.

Critical Area	Buffer Width
Offsite Wetland #3 Category II Wetland (Habitat Score: 8)	260 ft = High LUI Buffer
Individual Oregon White Oak Habitat	N/A *(See Table 3 for Oak Habitat Summary)*

WETLAND BUFFER MITIGATION PLAN

The buffer mitigation plan was developed following Camas Municipal Code CMC) Sections 16.53 Wetlands to offset the project impacts proposed and allow for no net loss of habitat functions onsite. The construction of this residential subdivision within the appropriate zoning location will provide housing for the southwest Washington market, specifically high density residential within the City of Camas where the market demand is high. The project avoids direct impacts to the highest functioning buffer habitat and oak trees while utilizing the historically impacted areas of the subject site for development (existing building footprints, parking and driveway areas, maintained yard areas, and historic agriculture fields that have been highly managed over the history of the site due to livestock use).

Avoidance & Minimization

The proposed single-family residence subdivision has been designed to avoid onsite critical areas to the extent possible while still providing a residential subdivision meeting the density and design requirements required by the City of Camas. The proposed residential lots, roadways and stormwater facility required for the subdivision have been designed to avoid onsite critical areas. Although the stormwater facility has been designed to avoid onsite critical areas, the facility requires a flow spreader outfall that will result in minor encroachment into the wetland buffer in the far southern portion of the study area. The flow spreader outfall has been designed to the minimum required for the structure, avoids direct impacts to mature vegetation, and can be mitigated for onsite for no net loss of habitat function or area for (Figure 6). Additionally, impacts from the flow spreader pipe avoid impacts to mature vegetation and are temporary.

Wetland Buffer Impacts & Mitigation

A small area of buffer impact will be unavoidable to construct the required flow spreader outfall from the stormwater facility within an adjacent area of lower elevation. To allow for the flow spreader outfall within the outer limits of the Category II wetland buffer, mitigation to offset the buffer impact is proposed. Although the offsite portions of the wetland unit provide higher buffer functions, this onsite buffer area where the flow spreader outfall is proposed is degraded and consists of monotypic pasture grasses with no significant vegetation to be impacted. The area of buffer impact imposed by the flow spreader outfall has been kept to the minimum size required and quantified to be 58 sf (Figure 6). The project proposes to offset this buffer impact area at a 1:1 ratio by buffer averaging nearby (and north of the standard 260-foot base buffer width otherwise held by the project along the southern parcel boundaries) over an area totaling 58 sf in size (Figure 6).

Temporary buffer impacts will be associated with the installation of the underground pipe that is required to connect the stormwater facility to the flow spreader outfall. A trench will be excavated within the pipe corridor and will avoid impacts to mature vegetation. The pipe trench will be back-filled with the native soils temporarily removed during construction of the pipe trench. All exposed soils from the trench and pipe installation activities will be re-vegetated using native seed mix appropriate for upland wetland buffer habitat – “Native Riparian seed mix” from Sunmark Seeds (or similar product) is recommended at the standard seeding rate of one pound per 1,000 sf.

Under CMC 16.53.050.2, wetland buffer averaging is allowed to achieve no net loss of functions when the total area contained in the buffer after averaging is no less than that contained within the buffer prior to averaging. The proposed mitigation ensures that the construction of the flow spreader outfall within a portion of the Category II buffer will results in no net loss of buffer area or functions.

Table 2. Wetland Buffer Impacts & Mitigation Summary.

Critical Area	Impact	Mitigation (Area)
260-ft Buffer Potential Offsite Wetland #3	Flow Spreader Outfall Impacts to Outer Limits of 260' Buffer **(58 sf)**	Buffer Averaging @ 1:1 Ratio **(58 sf)**

Wetland Conclusions

The above sections outline how the proposed project will meet the CMC 16.53 Wetlands. The proposed residential subdivision has been designed to avoid onsite critical areas to the full extent possible while still providing a residential subdivision meeting the density and design requirements required by the City of Camas. The proposed mitigation ensures that the construction of the flow spreader outfall within a small portion of the outer 260-foot buffer will result in no net loss of buffer area or functions.

WDFW PRIORITY HABITAT

The tree survey identified a total of five individual Oregon white oak trees onsite. These oaks were numbered and mapped by the Tree Plan (Appendix C - Arbor Science Tree Care, June 2025) and depicted on Figure 6. Four of the five oaks were found to have 20-inch diameter at breast height (dbh) trunk measurements (Oak #2, 45, 47, and 54). The fifth oak tree consists of a single tree with a 6-inch dbh trunk measurement located along the eastern parcel boundary (Oak # 28). See Figure 6 and Appendix C for the oak tree locations. The four oak trees inventoried by the tree survey with dbh measurements of 20-inches or larger are considered jurisdictional as they meet the WDFW criteria for "individual oak" Priority Habitat. Oregon white oak Priority Habitat is protected by WDFW and also jurisdictional under the local CMC habitat code. The understory and herbaceous layer associated with the onsite oak habitat is highly disturbed due to grazing or dominated by Himalayan blackberry.

Habitats of Local Importance

As stated above, four of the five individual Oregon white oak trees identified as onsite are over 20-inches dbh and therefore meet the criteria listed under CMC 16.61.010.A.3.a that defines Oregon white oak habitat of local importance:

i. Individual Oregon White Oak trees with a twenty-inch diameter at breast height (twenty inches dbh).
ii. Stands of Oregon White Oak trees greater than one acre, when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height (twelve inches dbh), are used by priority species, or have a large canopy.
iii. All Oregon White Oak snags unless determined by an arborist to be a hazard.

The project proposes the removal of one of these jurisdictional Oregon white oak tree (Oak#47). Mitigation to offset the removal of this jurisdictional oak tree is proposed to meet CMC Section 16.61 Fish and Wildlife Habitat Conservation Areas code. The following mitigation plan section details the mitigation measures proposed.

Table 3. Oregon White Oak Summary.

Oak Tree #	DBH	Jurisdictional per WDFW PHS &/or CMC Local Habitats of Importance Criteria *(Individual oak tree >20" dbh)*	Proposed for Removal	Requires Mitigation
2	62"	YES	NO	NO
28	**6"**	**NO**	YES	NO
45	32"	YES	NO	NO
47	**28"**	YES	YES	**YES**
54	20"	YES	NO	NO

Note: Oak #47 will be repurposed as a woody habitat enhancement element within the onsite oak mitigation area.

OREGON WHITE OAK MITIGATION PLAN

The below mitigation plan was developed following Camas Municipal Code (CMC) Section 16.61 Fish and Wildlife Habitat Conservation Areas. The project proposes the removal of one individual oak tree (Oak #47, 28" dbh) as it is intertwined with the adjacent Oregon ash trees which are within the path of the proposed access road to the stormwater facility. The single oak tree impacts will offset onsite with oak mitigation to allow for no net loss of habitat functions onsite.

The onsite oak mitigation will consist of Oregon white oak tree and native shrub enhancement within the southern portion of the site to offset the removal of the single oak tree. The mitigation plan will also incorporate oak mitigation and native enhancement within the wetland buffer also located in the far southern extent of the project and will allow for an extension of the existing treeline in this area. The perimeter of the stormwater facility will also be planted with oak mitigation plantings, as well as the understory of the adjacent large oaks to be preserved in this area (Oak #s 45 and 54). See Figure 6.

Avoidance and Minimization

Following the mitigation sequencing requirements outlined under CMC 16.51.170, the project has avoided and minimized impacts to the full extent practicable while still meeting the required design elements for a subdivision of this size within the city limits of Camas. The unavoidable impacts have been quantified, and appropriate mitigation proposed onsite for no net loss of habitat area or function onsite.

The project has been designed to avoid direct impacts to and retain the three other jurisdictional Oregon white oak trees present onsite, two of these consisting of the largest oak trees inventoried (Oak #2, 62" dbh and Oak #45, 32" dbh), with the third Oak tree to be retained (Oak #54, 20").

Oak #2 is located in the far northeast corner of the project, Oak #45 is located in the far south/central portion of the project just north of the stormwater facility, and Oak #54 is near the eastern property boundary east of the stormwater facility. The dripline of each of these oak trees will be located, staked, and fenced prior to construction to protect the critical root mass of the tree during grading and site construction. Native shrubs will be added as understory plants within the driplines of the retained oaks in the south allowing for a vegetated habitat connection between the onsite and offsite mix oak habitat to the south.

Avoidance of the Oak tree #47 was originally attempted by the project, however it was determined that there was no reasonable location for the access road for the stormwater detention facility access road with less oak impacts. The project arborist also determined that since this oak root system and canopy of this tree are

intertwined with the adjacent Oregon ash trees (Tree #s 48, 49 & 50) that if the ash were removed, that the oak would also need to be removed as its vitality would be compromised and it would ultimately be directly impacted.

The unavoidable impact to Oak #47 is required to meet the stormwater engineering design requirements and its removal was recommended by the arborist. There is sufficient space to mitigate for this tree onsite by providing a habitat corridor extension between the on and off site oak habitat. The existing forested treeline present in the south will be extended with new oak tree installation and the historically impacted understory of the retained oak will be enhanced. Oak #47 will also be repurposed as a woody habitat element within the onsite oak mitigation area, Figure 6.

The majority of the subject parcel is historically disturbed due to cattle grazing with little to no native scrub-shrub understory habitat present onsite. There is no native understory present within the area of the jurisdictional oaks present onsite including the understory of the oak proposed for removal.

Oregon White Oak Impacts and Mitigation

The removal of the single jurisdictional Oregon white oak (Oak # 47) is unavoidable by the project to meet the City development code requirements. The oak habitat impacts were calculated by quantifying the total oak canopy habitat and function to be removed from the site.

The oak habitat mitigation was designed to follow the requirements of CMC 16.51.180 and will sufficiently offset the loss of this specific oak habitat lost onsite. The mitigation has further been designed to offset the temporal loss of the oak habitat onsite, enhance the functions of the oak habitat to be retained on site, provide greater connectivity to the oak habitat present directly offsite, and will be managed by the HOA for perpetuity to ensure maintenance and survival of the habitat into the future. Previously the onsite oak habitat was grazed by horses, which led to a decline in the overall habitat present. The oak habitat to be impacted has no native understory shrub component and the oak habitat present along the perimeter of the site is dominated by Himalayan blackberry. By removing the grazing impacts from the horses, creating, enhancing and restoring areas of the onsite habitat, the proposed mitigation will provide a higher functioning Oregon white oak habitat as the area matures than that present onsite today. Additionally, the single Oregon white oak to be removed will be repurposed within the onsite mitigation areas to provide additional enhancement by the addition of oak habitat woody elements. The total oak habitat canopy loss is 875 square feet, with 9,900 square feet of onsite mitigation proposed, providing an approximate 11:1 mitigation offset ratio, see Figure 6. This mitigation ratio is considered sufficient as it exceeds the WDFW guidance for a 10:1 mitigation ratio and the habitat provided by Oak #47 is of low habitat quality. Additionally, it should be noted that the unavoidable impacts permitted for much larger oaks at the Landing at Green Mountain – Phase I (directly to the east) were mitigated for at a mitigation ratio of 5:1.

The proposed Oregon white oak mitigation area is open and will offer plenty of sunlight and adequate canopy area for the oak trees and native shrub growth post project completion. The mitigation location will also help to provide greater connectivity for wildlife habitat, by providing shade, shelter, and food sources within the extended contiguous habitat corridor connection provided to the offsite forested and mixed oak canopy than currently present. Protection will be put in place around the perimeter of the mitigation areas during site grading and construction activities and after. Compensatory measures will need to be implemented if during construction the critical root mass of the retained oak trees are inadvertently impacted.

The mitigation proposed will offset the Oregon white oak Priority Habitat impacts onsite for no net loss of priority function or area following the CMC guidelines.

Table 4. Oak Impacts & Mitigation Summary.

Oak Label	Impact	Mitigation
Oak #47	Oregon White Oak (28-inch dbh) 875 sf Canopy Loss	Oregon white oak mitigation areas at a 11:1 Ratio (Oak tree and native shrub enhancement onsite) 9,900 sf

OAK MITIGATION PLANTING PLAN

Site Preparation

1. Demarcate the on-site "Protected Oak Habitat" (Oregon white oak retention and mitigation area boundaries) and install tree protection fencing along the proposed planting areas and the perimeter of the existing oak canopy dripline, See Figure 4.
2. Maintain this tree protective fencing for the full duration of the project construction.
3. Mow grasses, herbaceous vegetation and invasive species present within mitigation areas prior to tree installation.

Note: Excavation, fill or compaction of the native soils is not to take place within the protected oak habitat. No lawn or ornamental landscaping is to be located within the protected oak habitat.

Planting Methods

Plant in fall through early spring (October-April) at specified spacing following the planting plan.
Container/Ball and Burlap Stock

1. Dig hole using a tree shovel/auger/mini-excavator or comparable tool 16-inches wide and 4-inches deeper than the root system, scarify sides of hole to 4-inches. Remove plant from container and loosen roots with hand or score vertically on sides and bottom with knife. Set plant upright and plumb in hole so the crown is just above the finish grade. Ensure that roots are extended down entirely and do not bend upward.
2. Replace loose soil around plant and firmly compact the soil around the plant to eliminate air spaces. Do not use frozen soil for backfilling.
3. Firmly compact the soil around the planted species to eliminate air spaces.
4. Install woody mulch around the base of planted and retained Oregon white oak trees to insulate plantings, maintain moisture content of soil and reduce invasive plant competition.
5. Irrigate according to performance standards for the first three summers after planting or as site and weather conditions warrant.

Planting Specifications

Planting will begin in Winter of 2025/Spring of 2026 while onsite soils are more saturated (and stock is dormant). The following tables summarize the native plant selection, spacing, size, and quantity for the on-site mitigation area:

Table 5. Oak Mitigation Planting Plan.

Common Name	*Scientific Name*	*Stock*	*Spacing*	*Quantity*
TREES (9,900 sq. ft.)				
Oregon white oak, FACU	*Quercus garryana*	2-inch caliper	14 ft.	25
Oregon white oak, FACU	*Quercus garryana*	1-gallon container	14 ft.	25
			Total =	50
SHRUBS **(9,900 sq. ft.)**				
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	50
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	50
Snowberry, FACU	*Symphorica rpos albus*	1-gallon or 24-36" bare-root	6 ft.	50
Ocean spray, FACU	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	50
			Total =	**200**
			Grand Total of Native Shrubs =	**250**

Protective Signage

Post construction, install permanent signs along the boundary of a "Protected Oak Habitat" meeting city standards or conditions outlined under the permit. See Objective 2, Performance Standard 2b below.

Maintenance Plan

Maintenance at the on-site mitigation area covers a minimum of 5-years and will involve removing persisting invasive plant species in addition to watering and re-installing failed species as necessary. The maintenance will include the following activities when necessary:

1. Remove and control non-native/noxious vegetation around all newly installed plants. During years 1 through 5 invasive species will be removed and suppressed as often as necessary to meet a performance standard of no greater than 20 percent cover by invasive species, measured by monitoring plots.
2. Irrigate planted species as necessary during the dry season, approximately July 1 through October 15. Irrigation is recommended to occur on a two-week cycle (minimum) during the dry season for the first three years. Water will be provided by a temporary above-ground irrigation system or a water truck.
3. Replace dead or failed Oregon white oak trees as described for the original installation to meet the minimum annual performance standard of 100% survival over the 5-year monitoring period. See Objective 1 for the full performance standards outlined by year.

Monitoring Plan

The mitigation site will be monitored for a 5-year period following project construction; monitoring will take place in years 1, 2, 3 and 5. Monitoring reports will be submitted to the City of Camas by the end of each monitored year. The goal of monitoring is to determine if the previously stated performance standards are being met. The mitigation area will be monitored once during the growing season, preferably during the same two-week period each year to better compare the data.

During the first annual monitoring event, representative monitoring plot locations and photo points will be selected within the mitigation areas and permanently marked with metal T-posts (or similar). Monitoring plot

and photo point locations will be labeled on the As-built Map and included in the annual monitoring reports.

Monitoring Report Contents

The annual monitoring reports will contain at least the following:

- Location map and as-built drawing of Oregon white oak mitigation and retention areas as depicted on Figure 5 of this mitigation plan.
- Photographs from permanent photo points (10 minimum).
- Historic description of project, including dates of Oregon white oak tree installation, current year of monitoring, and restatement of mitigation goal.
- Documentation of plant survival, cover, and overall development of the plant community from the ten established monitoring plot locations.
- Photo evidence that the protective oak habitat signage is in place and legible along the outer perimeter of the mitigation areas onsite.
- Assessment of non-native, invasive plant species and recommendations for management.
- Summary of maintenance and contingency measures proposed for the next season and those completed over the past season.

Contingency Plan

If the performance standards are not met by the fifth year following project completion, a contingency plan will be developed and implemented. All contingency actions will be undertaken only after consulting and gaining approval from the City of Camas. The applicant will be required to complete a contingency plan that describes (1) the causes of failure, (2) proposed corrective actions, (3) a schedule for completing corrective actions, and (4) whether additional maintenance and monitoring are necessary.

Site Protection

The on-site mitigation area will be owned and managed by the future Homeowners Association (HOA) Associated with the subdivision. The HOA will be responsible for managing and contracting out the annual monitoring of the on-site mitigation area (to AshEco Solutions, LLC or similar entity) for the initial 5-year monitoring period. Additionally, the HOA will be responsible for managing and contracting out the seasonal maintenance required to maintain the onsite mitigation areas in perpetuity, to ensure the onsite Oregon white oak habitat is allowed to thrive. The applicant will establish and record a permanent and irrevocable conservation covenant over the onsite mitigation areas to protect the established habitat in the future.

MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS

The mitigation goal of protecting the onsite Oregon white oak habitat for no net loss of functional habitat onsite will be met when the below objectives and performance standards are met.

Objective 1: Mitigate for 875 sf of Oregon white oak habitat with onsite oak mitigation over 9,900 sf.

Performance Standard 1a. Document the removal of invasive species within the mitigation area and install boundary protection fencing around the dripline of the retained oak trees prior to grading activities. Submit photos within the As-built to document the completion of this mitigation site preparation.

Performance Standard 1b. Document the installation of the native Oregon white oak trees, native shrub enhancement and repurposing of oak woody element (Oak #47) as specified by Figure 6 within the defined mitigation area onsite. Within 60 days of project completion, submit As-built Map and documentation to show that the mitigation plan has been implemented according to this plan, or as conditioned by permit. As-built documentation is to include; planting locations on an As-built Map, native nursery receipt showing plant species and quantities, representative photos of the mitigation area from a minimum of ten (4) established

photo point locations.

Performance Standard 1c. In Years 1-5, the Oregon white oak mitigation trees are to achieve 100-percent (100%) survival. (If dead trees are replaced to achieve the 100 percent survival rate, this performance standard will be met).

Performance Standard 1d. By Year 2, native woody shrub species within the onsite mitigation areas are to achieve ninety-percent (90%) survival of. (Native volunteer growth will count towards this cover requirement, as will the installation of new plants to offset mortality.)

Performance Standard 1e. By Year 3, native woody shrub species within the onsite mitigation areas are to achieve eighty-percent (80%) survival of native woody shrub species. (Native volunteer growth will count towards this cover requirement, as will the installation of new plants to offset mortality.)

Performance Standard 1f. By Year 5, native woody shrub species within the onsite mitigation areas are to achieve thirty percent (30%) aerial cover of native woody shrub species, or eighty percent (80%) survival. (Native volunteer growth will count towards this cover requirement, as will the installation of new plants to offset mortality.)

Performance Standard 1g. In All Years, non-native/invasive plant species will not exceed 20-percent (20%) aerial cover across the onsite mitigation area.

Objective 2: <u>Provide long-term protection for the onsite mitigation area.</u>

Performance Standard 2a. Record a conservation covenant with the City of Camas. This performance standard will be met when a copy is submitted with the As-built documentation (or prior as conditioned by the approved permit) .

Performance Standard 2b. Post permanent signage along the outer boundaries of the "Protected Oak Habitat" (oak mitigation and retention areas) . Signs are to read:

"Critical Area– Please Retain in a Natural State"

or as otherwise determined by the City of Camas permit conditions.

Signage will remain in legible condition; if they are missing or illegible, they will be replaced. This performance standard will be met when signs are documented to be in place and of good condition within the final monitoring report.

DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigator. It is correct and complete to the best of our knowledge. It should be considered a preliminary mitigation plan and used at your own risk until it has been reviewed and approved in writing by the local agency with jurisdiction over the site. AES personnel base the above listed conclusions on standard scientific methodology and best professional judgment.

REFERENCES

City of Camas Municipal Code. 2008 (Amended). Section 16.53 Wetlands.

City of Camas Municipal Code. 2008 (Amended). Section 16.61 Fish and Wildlife Habitat Conservation Areas.

Clark County Geographic Information Systems. Available at: http:/gis.clark.wa.gov/mapsonline/ [Accessed 2025].

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Online edition. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Olson, P. & Stockdale, E. 2010. Washington State Department of Ecology: Determining the Ordinary High Water Mark on Streams in Washington State. Second Review Draft. Ecology Publication #08-06-001.

U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). 1974. Soil Survey of Clark County Area. Online document. Available at: http://websoilsurvey.nrcs.usda.gov/app/. [Accessed 2025]

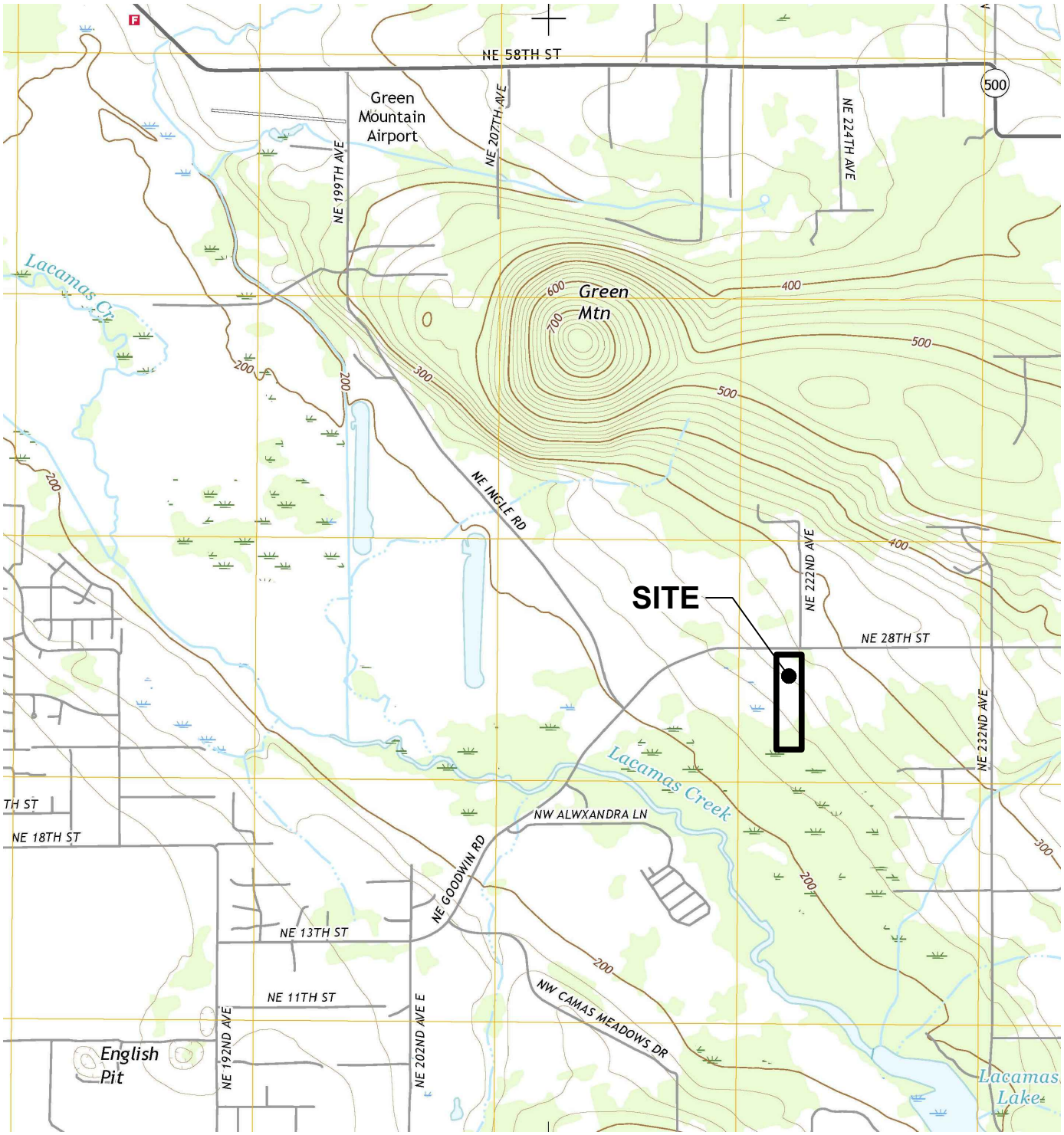
U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). 2022. Washington State Hydric Soils List. Available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. [Accessed 2025].

U. S. Fish & Wildlife Service. 2022. National Wetlands Inventory. Online document. Available at: http:www.wetlandsfws.er.usgs.gov/NWI/index.html. [Accessed 2025].

Wakeley, J.S.; R.W. Lichvar; and C.V. Noble, eds. U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Washington State Department of Ecology (WDOE). 1997. Washington State Wetlands Identification and Delineation Manual. Publication #96-94. Olympia, Washington.

Washington State Department of Fish and Wildlife (WDFW). Management Recommendations for Washington's Priority Habitats – Oregon White Oak Woodlands (Larsen, 1998).



NOTE(S):
USGS, LACAMAS CREEK QUADRANGLE
WASHINGTON-CLARK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

Ash ECO SOLUTIONS, LLC

PARCEL(S): 173210000, 173177000 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	VICINITY MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** Landing at Green Mountain Ph II **SITE LOCATION ADDRESS:** Parcels East of 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 1 **DATE:** 5-27-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



Legend

- Taxlots
- Contours Lines - 2 ft
- Contour Lines - 10 ft
- Contour Lines - 100 ft

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC

PARCEL(S):
173210000, 173177000

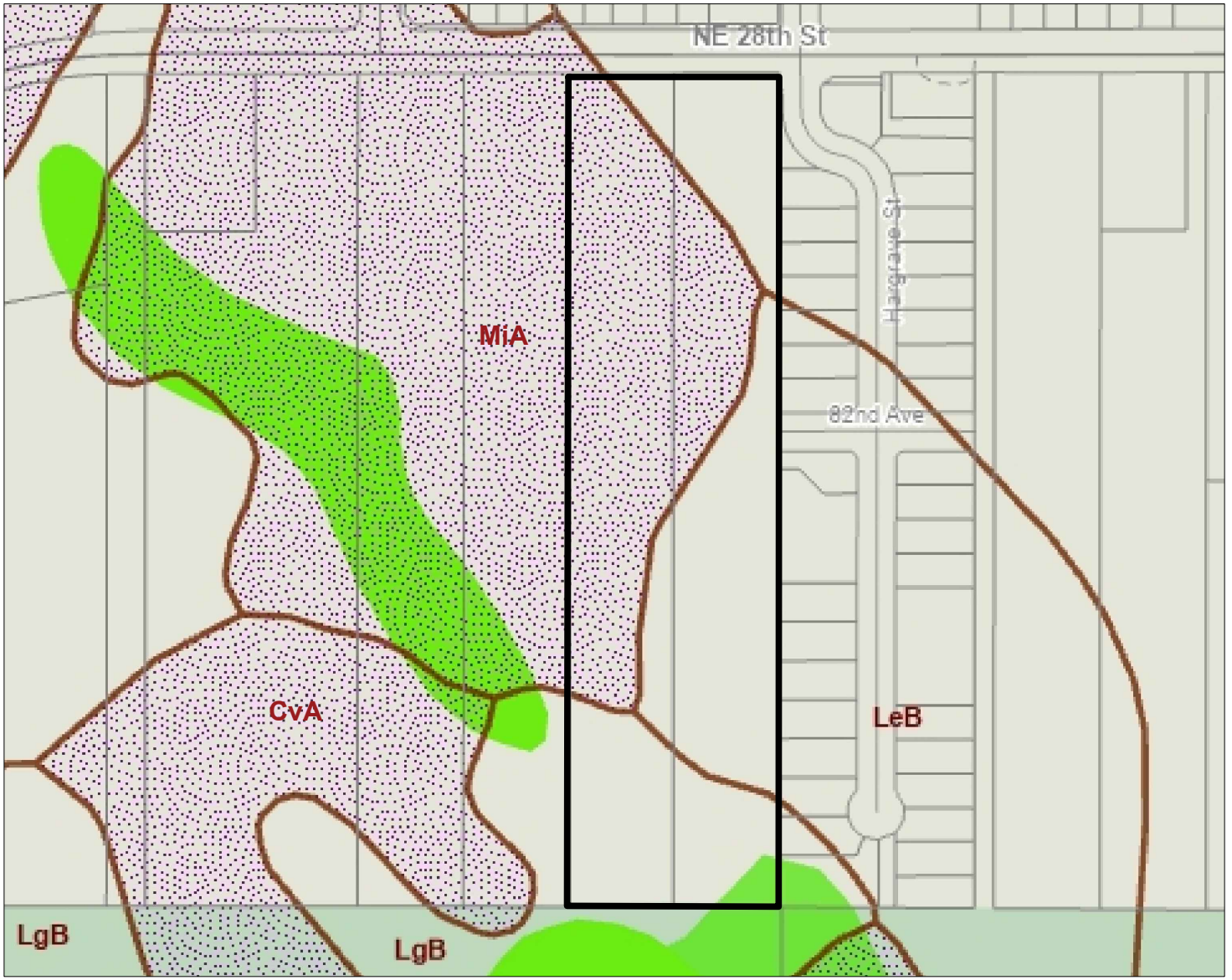
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

AERIAL PHOTO & TOPO MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain
SITE LOCATION ADDRESS:
Parcels East of 2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 2
DATE: 5-27-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



Legend

- Taxlots
- Soil Type
- Hydric Soils
- Potential Wetlands Presence
- Permitted Wetland
- NWI Wetland

CvA -

MiA -

LeB -

LgB -

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC

PARCEL(S):
173210000, 173177000

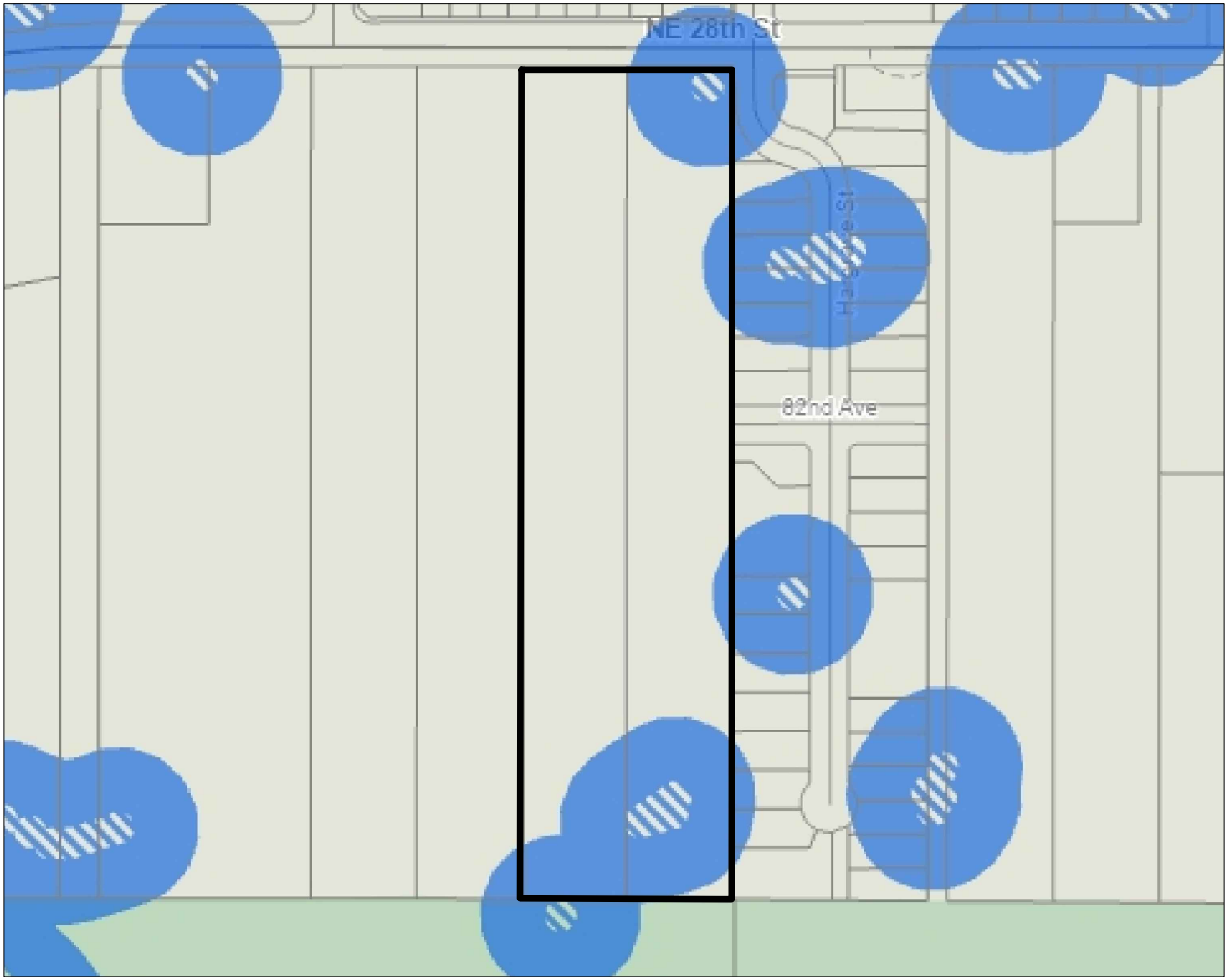
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

SOIL SURVEY &
NATIONAL WETLANDS INVENTORY MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain
SITE LOCATION ADDRESS:
Parcels East of 2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 3
DATE: 5-27-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



Legend

- Taxlots
- Species
  - Species Area
  - Adjacent to Species Area
- Habitat
  - Habitat Area
  - Adjacent to Habitat Area
- Riparian Habitat Site Class
- Stream
- Lake

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC

PARCEL(S):
173210000, 173177000

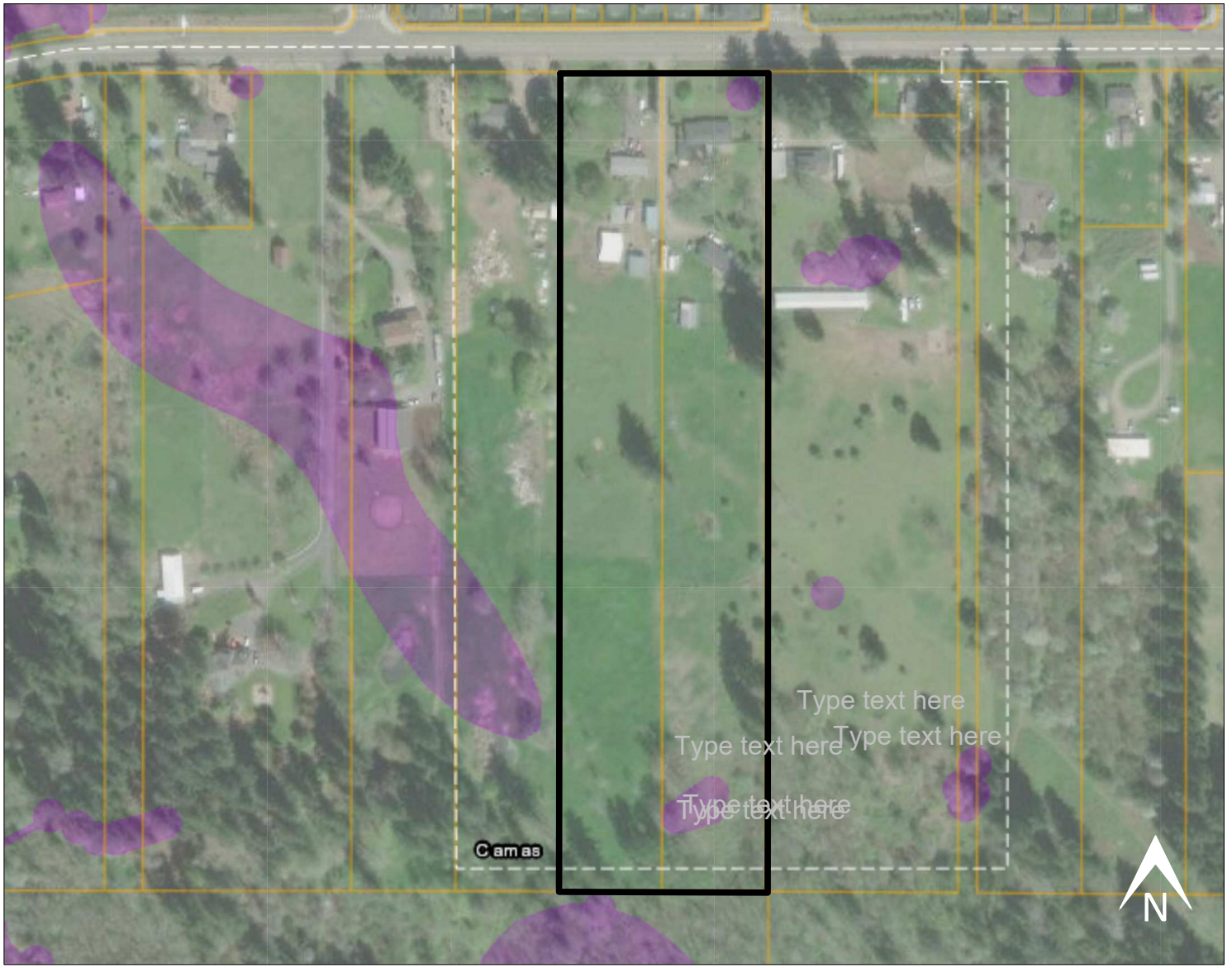
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

RIPARIAN HABITAT & SPECIES MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain
SITE LOCATION ADDRESS:
Parcels East of 2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 4
DATE: 5-27-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



Legend

Parcels

Parcels

PHS on the Web

PHS Public Points

PHS Public Lines

PHS Public Polygon Outlines

AS MAPPED

Masked

PHS Public Polygons

AS MAPPED

SECTION

QTR-TWP

TOWNSHIP

0 250 500

SCALE IN FEET

1" = 250'

Ash ECO SOLUTIONS, LLC

PARCEL(S):
173210000, 173177000

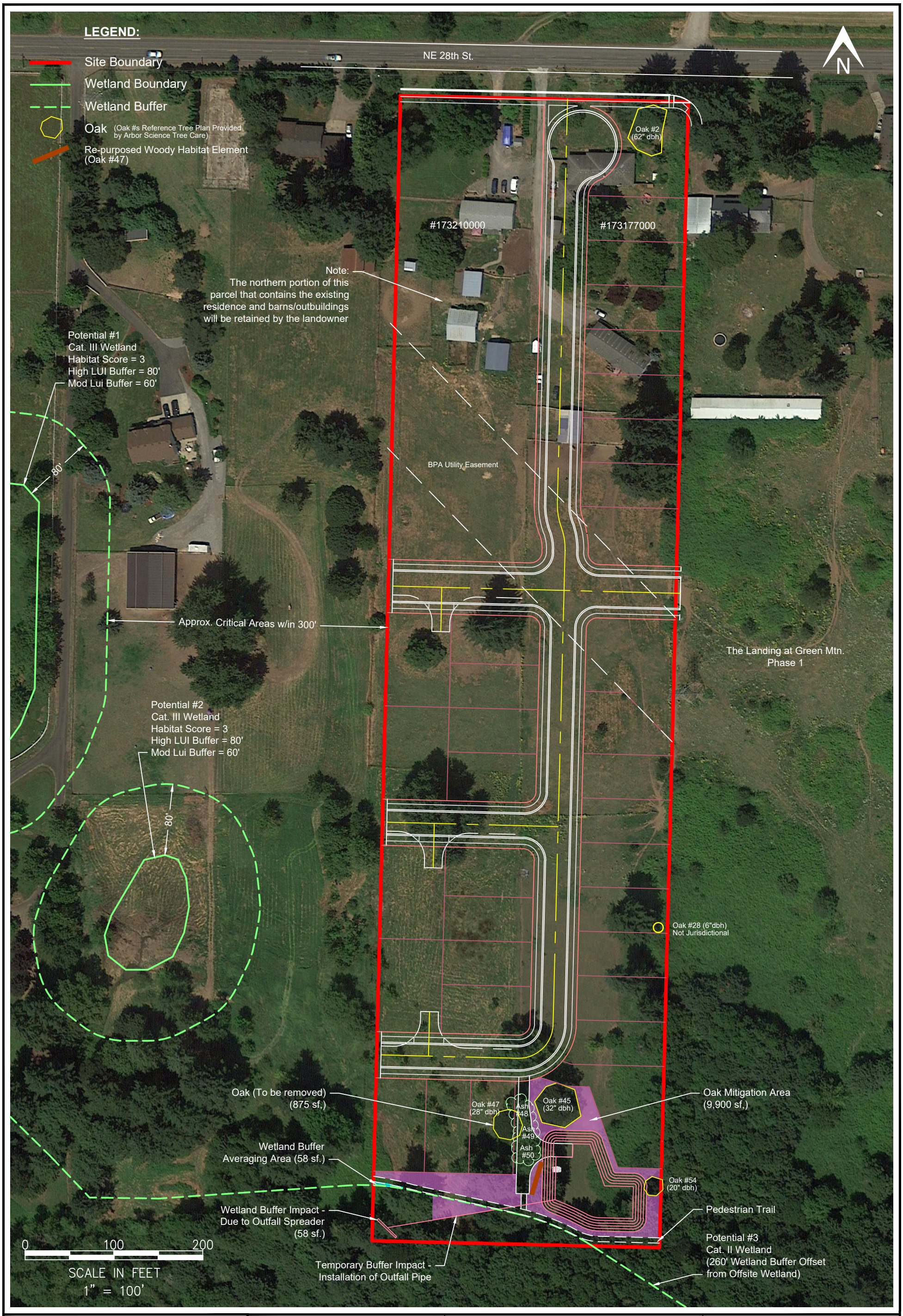
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

WDFW PHS MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain Ph II
SITE LOCATION ADDRESS:
Parcels East of 2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 5
DATE: 5-27-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg

AshECO SOLUTIONS, LLC	**PARCEL(S):** 173210000, 173177000 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	EXISTING CONDITIONS & PROPOSED SITE PLAN **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** Landing at Green Mountain - II **SITE LOCATION ADDRESS:** Parcels East of 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 6 **DATE:** 6-16-25

Appendix A

Site Photos

The Landing at Green Mountain - Site Photos



Photo 1.
View of the open pasture area located in the central portion of the study area. This area has historically been used to graze cattle.



Photo 2.
The Oregon white oak located in the far southeast corner of the study area is visible in center of photos (dark green canopy). This tree will be retained. The understory has historically been grazed and mowed.



Photo 3.
View south down the far eastern property line of the study area. The bulk of the area consists of open pasture grasses. The large Douglas-fir tree visible at left of photo is located near the east property line. The forested area visible in back of photo represents the offsite undeveloped park property owned by Clark County.

Appendix B

Wetland Rating Forms

Wetland name or number Offsite Wetland #1

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Offsite Wetland #1 Date of site visit: 6/13/2024

Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___No Date of training 10/16

HGM Class used for rating Depressional Wetland has multiple HGM classes? ✓ Y ____N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY ___✓___ (based on functions___ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27
_____**Category II** – Total score = 20 - 22
___✓___**Category III** – Total score = 16 - 19
_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	H M (L)	
Landscape Potential	(H) M L	H (M) L	H M (L)	
Value	(H) M L	H (M) L	H M (L)	**TOTAL**
Score Based on Ratings	8	6	3	17

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	✓

Wetland name or number Offsite Wetland #1

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number Offsite Wetland #1

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   X___The wetland is on a slope (slope can be very gradual),
   X___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   ____The water leaves the wetland **without being impounded**. Note: Water is impounded at south

   NO – go to 5 **YES –** The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number Offsite Wetland #1 Type text here

5. Does the entire wetland unit **meet all** of the following criteria?
   ____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**

   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number Offsite Wetland #1

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed plants > 95% of area points = 5 Wetland has persistent, ungrazed plants > ½ of area points = 3 Wetland has persistent, ungrazed plants ≥ 1/10 of area points = 1 Wetland has persistent, ungrazed plants < 1/10 of area Wetland located within horse pasture that is regularly grazed. points = 0	0
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is ≥ ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	6

Rating of Site Potential If score is: __**12-16 = H** ✓**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source Wetland located within horse pasture that is regularly grazed. Yes = 1 No = 0	1
Total for D 2 Add the points in the boxes above	3

Rating of Landscape Potential If score is: ✓**3 or 4 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which the unit is found.) Yes = 2 No = 0	1
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: ✓**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #1

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream/ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (question 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	8

Rating of Site Potential If score is: __**12-16 = H** ✓**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	1
Total for D 5 Add the points in the boxes above	2

Rating of Landscape Potential If score is: __**3 = H** ✓**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. Is the unit in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met. The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately downgradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther downgradient. points = 1 • Flooding from groundwater is an issue in the sub-basin. points = 1 • The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 • There are no problems with flooding downstream of the wetland. points = 0	1
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	1

Rating of Value If score is: __**2-4 = H** ✓**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #1

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac. **1**

____Aquatic bed — 4 structures or more: points = 4
_✓_Emergent — 3 structures: points = 2
____Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1
____Forested (areas where trees have > 30% cover) — 1 structure: points = 0

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods **1**

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated — 4 or more types present: points = 3
_✓_Seasonally flooded or inundated — 3 types present: points = 2
____Occasionally flooded or inundated — 2 types present: points = 1
_✓_Saturated only — 1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland
____Intermittently or seasonally flowing stream in, or adjacent to, the wetland
____**Lake Fringe wetland** — **2 points**
____**Freshwater tidal wetland** — **2 points**

H 1.3. Richness of plant species **1**

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

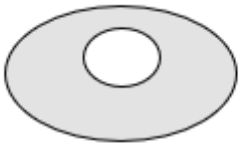
If you counted: > 19 species — points = 2
5 - 19 species — points = 1
< 5 species — points = 0

H 1.4. Interspersion of habitats **0**

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

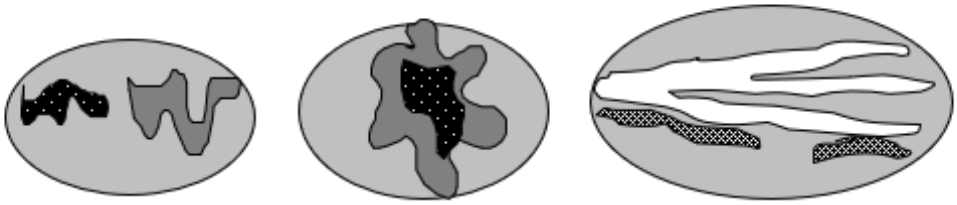


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



Wetland name or number Offsite Wetland #1

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ____Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ____Standing snags (dbh > 4 in.) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) __✓__At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	1
Total for H 1 Add the points in the boxes above	4

Rating of Site Potential If score is: __**15-18 = H** ___**7-14 = M** __✓__**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 0% **+** [(18% moderate and low intensity land uses)/2] = 9 % Total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 26% **+** [(18% moderate and low intensity land uses)/2] = 22 % Total habitat > 50% of Polygon points = 3 Total habitat 10-50% and in 1-3 patches points = 2 Total habitat 10-50% and > 3 patches points = 1 Total habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is: __**4-6 = H** ___**1-3 = M** __✓__**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more Priority Habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW Priority Species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	0

Rating of Value If score is: __**2 = H** ___**1 = M** __✓__**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #1

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland A

Wetland name or number _____

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats

— **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

Water

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes = **Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No = **Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No = **Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata
[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* — The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

Wetland Rating Form Divider Sheet

Wetland name or number Offsite Wetland #2

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Offsite Wetland #2 Date of site visit: _____

Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___No Date of training 10/16

HGM Class used for rating Depressional Wetland has multiple HGM classes? ✓ Y ____N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY ___✓___ (based on functions___ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27
_____**Category II** – Total score = 20 - 22
___✓___**Category III** – Total score = 16 - 19
_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	H M (L)	
Landscape Potential	(H) M L	H (M) L	H M (L)	
Value	(H) M L	H (M) L	H M (L)	**TOTAL**
Score Based on Ratings	8	6	3	17

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	✓

Wetland name or number Offsite Wetland #2

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number Offsite Wetland #2

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ____The wetland is on a slope (slope can be very gradual),
   ____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   ____The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number Offsite Wetland #2

5. Does the entire wetland unit **meet all** of the following criteria?
   ____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**

   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number Offsite Wetland #2

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed plants > 95% of area points = 5 Wetland has persistent, ungrazed plants > ½ of area points = 3 Wetland has persistent, ungrazed plants ≥ 1/10 of area points = 1 Wetland has persistent, ungrazed plants < 1/10 of area Wetland located within horse pasture that is regularly grazed. points = 0	0
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is ≥ ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	6

Rating of Site Potential If score is: __**12-16 = H** ✓**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source waterfowl Yes = 1 No = 0	1
Total for D 2 Add the points in the boxes above	3

Rating of Landscape Potential If score is: ✓**3 or 4 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which the unit is found.) Yes = 2 No = 0	1
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: ✓**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #2

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream/ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (question 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	8

Rating of Site Potential If score is: __**12-16 = H** ✓**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	1
Total for D 5 Add the points in the boxes above	2

Rating of Landscape Potential If score is: __**3 = H** ✓**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. Is the unit in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met. The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately downgradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther downgradient. points = 1 • Flooding from groundwater is an issue in the sub-basin. points = 1 • The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 • There are no problems with flooding downstream of the wetland. points = 0	1
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	1

Rating of Value If score is: __**2-4 = H** ✓**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #2

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac. **1**

____Aquatic bed	4 structures or more: points = 4
_✓_Emergent	3 structures: points = 2
____Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1
____Forested (areas where trees have > 30% cover)	1 structure: points = 0

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods **1**

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated	4 or more types present: points = 3
_✓_Seasonally flooded or inundated	3 types present: points = 2
____Occasionally flooded or inundated	2 types present: points = 1
_✓_Saturated only	1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland	
____Intermittently or seasonally flowing stream in, or adjacent to, the wetland	
____**Lake Fringe wetland**	**2 points**
____**Freshwater tidal wetland**	**2 points**

H 1.3. Richness of plant species **1**

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

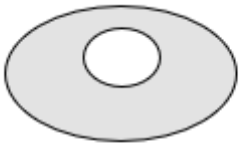
If you counted: > 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = 0

H 1.4. Interspersion of habitats **0**

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

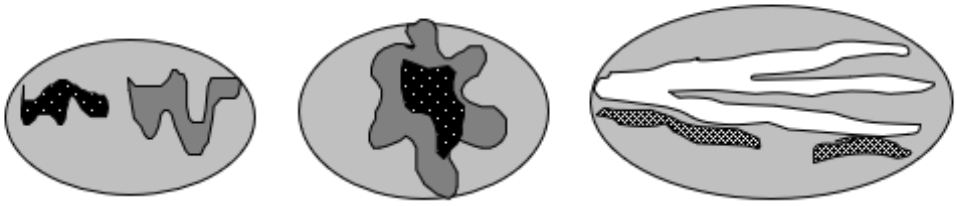


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



Wetland name or number Offsite Wetland #2

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ____Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ____Standing snags (dbh > 4 in.) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	1
Total for H 1 Add the points in the boxes above	4

Rating of Site Potential If score is: __**15-18 = H** ___**7-14 = M** ✓**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 0% **+** [(18% moderate and low intensity land uses)/2] = 9 % Total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 26% **+** [(18% moderate and low intensity land uses)/2] = 22 % Total habitat > 50% of Polygon points = 3 Total habitat 10-50% and in 1-3 patches points = 2 Total habitat 10-50% and > 3 patches points = 1 Total habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is: __**4-6 = H** ___**1-3 = M** ✓**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more Priority Habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW Priority Species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	0

Rating of Value If score is: __**2 = H** ___**1 = M** ✓**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #2

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number Offsite Wetland #2

- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats
- **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes = **Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No = **Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No = **Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata
[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* — The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

Wetland Rating Form Divider Sheet

Wetland name or number Offsite Wetland #3

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Offsite Wetland #3 Date of site visit: _____
Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___No Date of training 10/06

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___Y _X_N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY ___II___ (based on functions ✓ or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27
__X__**Category II** – Total score = 20 - 22
_____**Category III** – Total score = 16 - 19
_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	(H) M L	
Landscape Potential	H (M) L	H (M) L	H (M) L	
Value	(H) M L	H (M) L	(H) M L	**TOTAL**
Score Based on Ratings	7	6	8	21

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	✓

Wetland name or number Potential Wetland #3 - Offsite to south

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number Offsite Wetland #3

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ✓ The wetland is on a slope (*slope can be very gradual*),
   ✓ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   X The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES** – The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number Offsite Wetland #3

NO – go to 6 **YES** – The wetland class is **Riverine**
NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number Offsite Wetland #3

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	9

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? Yes = 2 No = 0	1
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: ✓ **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #3

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	8

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	0
Total for D 5 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther down-gradient. points = 1 Flooding from groundwater is an issue in the sub-basin. points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland. points = 0	1
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	1

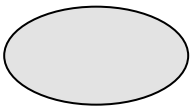
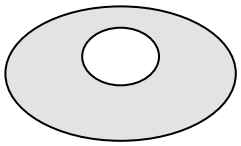
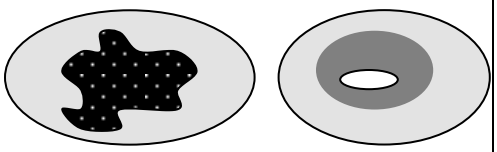
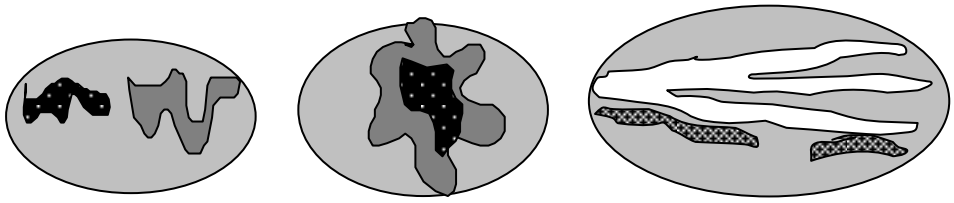
Rating of Value If score is: ___ **2-4 = H** ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #3

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* X Aquatic bed — 4 structures or more: points = 4 X Emergent — 3 structures: points = 2 X Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 X Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	4
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ____Permanently flooded or inundated — 4 or more types present: points = 3 X Seasonally flooded or inundated — 3 types present: points = 2 ____Occasionally flooded or inundated — 2 types present: points = 1 X Saturated only — 1 type present: points = 0 ____Permanently flowing stream or river in, or adjacent to, the wetland X Seasonally flowing stream in, or adjacent to, the wetland ____**Lake Fringe wetland** — **2 points** ____**Freshwater tidal wetland** — **2 points**	2
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	2
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points  **Low** = 1 point  **Moderate** = 2 points All three diagrams in this row are **HIGH** = 3points 	2

Wetland name or number Offsite Wetland #3

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* X Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). X Standing snags (dbh > 4 in) within the wetland X Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* X At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* X Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	5
Total for H 1 Add the points in the boxes above	15

Rating of Site Potential If score is: ✓ **15-18 = H** ___ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon 9% Accessible + (31/2) 15.5% = 24.5% points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches 20% Undist + (15.5%) = 35.5 (4 patches) points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use High LUI = 40% points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	0
Total for H 2 Add the points in the boxes above	3

Rating of Landscape Potential If score is: ___ **4-6 = H** ✓ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 X It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: ✓ **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #3

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

✓ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

✓ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes **–** Go to **SC 2.2** No **–** Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

Wetland name or number _____

This page left blank intentionally

Appendix C

Tree Plan

(Arbor Science Tree Care, June 2025)

ARBOR SCIENCE TREE CARE
SPECIALIZING IN SUSTAINABLE TREE CARE SOLUTIONS
arborsciencetreecare.com
360.521.0249
WA# ARBORST838DT OR CCB# 216351

June 28th 2025

Pacific Lifestyle Homes
1815 NE 99th St Vancouver WA 98682

The Landing At Green Mountain 2
22111 NE 28th St Camas WA 98607
Parcel # 173177000, 173210000

Re: Tree Survey per City of Camas CMC 18.13.045

Tree, Vegetation and Soil Protection During Construction.

During construction. Prior to initiating tree removal on the site, soils, vegetated areas and individual trees to be preserved shall be protected from potentially damaging activities pursuant to the following standards.

A. Placing Materials Near Trees. No person may conduct any activity within the protected area of any tree designated to remain, including, but not limited to, parking equipment, placing solvents, storing building material and soil deposits, dumping concrete washout and locating burn holes.

1. During construction, no person shall attach any object to any tree designated for protection.

B. Protective Barrier. Before development, land clearing, filling or any land alteration for which a tree is to be protected. The contractor
1. Shall erect and maintain readily visible protective tree fencing along the outer edge and completely surrounding the protected area of all protected trees or groups of trees that are to remain undisturbed. Fences shall be constructed of chain link and at least four feet high, unless other type of fencing is authorized by the planning official.

2.Shall prohibit excavation or compaction of earth or other potentially damaging activities within the barriers.

3. Shall maintain the protective barriers in place until the planning official authorizes their removal or a final certificate of occupancy is issued, whichever occurs first

4. Shall ensure that any landscaping done in the protected zone subsequent to the removal of the barriers shall be accomplished with light machinery or hand labor. No turf or lawn areas are to be installed within protected area.

5. In addition to the above, the planning official may require the following:

- Cover with mulch to a depth of at least six (6) inches or with plywood or similar material the areas adjoining the critical root zone of a tree in order to protect roots from damage caused by heavy equipment.

- Minimize root damage by excavating a two (2) foot deep trench, at edge of critical root zone, to cleanly sever the roots of trees to be retained.

- Have corrective pruning performed on protected trees in order to avoid damage from machinery or building activity.

- Maintain trees throughout construction period by watering and fertilizing if recommended by Arborist.

C. Grade.

1. The grade shall not be elevated or reduced within the critical root zone of trees to be preserved without the planning official's authorization. The planning official may allow coverage of up to one half of the area of the tree's critical root zone with light soils (no clay) to the minimum depth necessary to carry out grading or landscaping plans, if it will not imperil the survival of the tree. Aeration devices may be required to ensure the tree's survival.

2. If the grade adjacent to a preserved tree is raised such that it could slough or erode into the tree's critical root zone, it shall be permanently stabilized to prevent suffocation of the roots.

3. The applicant shall not install an impervious surface within the critical root zone of any tree to be retained without the authorization of the planning official. The planning official may require specific construction methods and/or use of aeration devices to ensure the tree's survival and to minimize the potential for root induced damage to the impervious surface.

4. To the greatest extent practical, utility trenches shall be located outside of the critical root zone of trees to be retained. The planning official may require that utilities be tunneled under the roots of

trees to be retained if the planning official determines that trenching would significantly reduce the chances of the tree's survival.

5. Trees and other vegetation to be retained shall be protected from erosion and sedimentation. Clearing operations shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, shrubs, ground cover and stumps shall be maintained on the individual lots, where feasible. Where not feasible appropriate erosion control practices shall be implemented pursuant to best management practices within industry standards.

D. Directional felling. Directional felling of trees shall be used to avoid damage to trees designated for retention and shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, shrubs, ground cover and stumps shall be retained where feasible. Where not feasible, appropriate erosion control practices shall be implemented pursuant to

E. Additional requirements. The planning official or Arborist may require additional tree, vegetation and soil protection measures which are consistent with accepted best management practices.

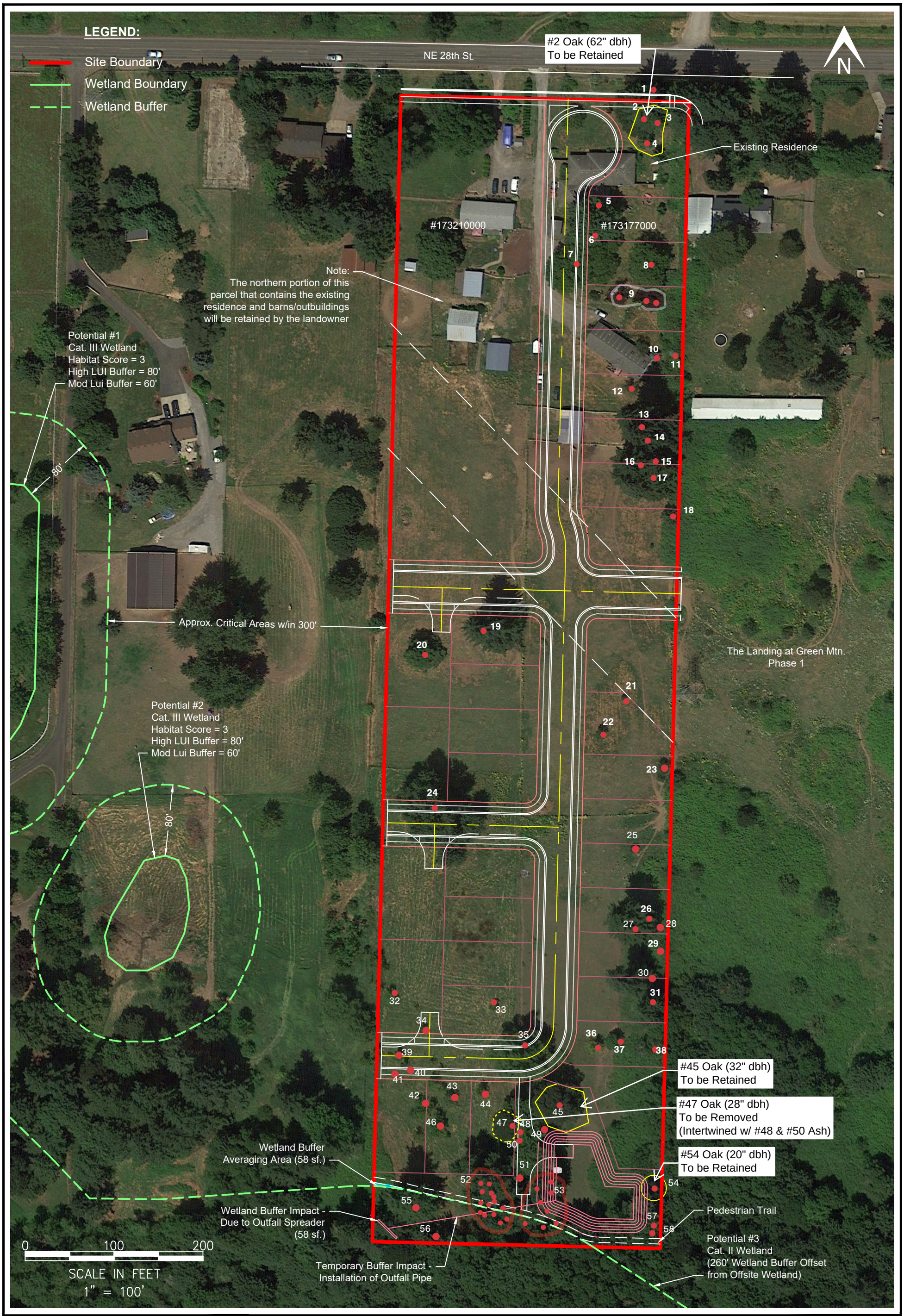
Tree Density Calculations:

Per City of Camas municipal code 18.13.045 this development requires 20 tree units per acre. The existing lot area is 9.59 acres, which has a density requirement of 191.8 tree units per acre. This proposed development retains 206 tree units to be preserved.
See attached map and table for tree detail and locations.

Prepared By Brandon Cheney
ISA Certified Arborist PN #7163A
TRAQ

Tree Number	Species	Common Name	DBH "	Retention Y/N	Condition	Tree Units
1	p. menziesii	Douglas-Fir	8	Y	Satisfactory	2
2	quercus	White Oak (multi stem)	62	Y	Satisfactory	26
3	p. menziesii	Douglas-Fir	52	Y	Satisfactory	22
4	cornus	Dogwood	9	Y	Satisfactory	2
5	acer	Bigleaf Maple	58	N	Fair	25
6	juglands	Black Walnut	31	N	Poor	12
7	juglands	Black Walnut	23	N	Fair	8
8	juglands	Black Walnut	24	N	Fair	8
9	prunus	(3 trees) Purple leaf plum	21	N	Fair	7
10	picea	Blue Spruce	9	N	Satisfactory	2
11	picea	Blue Spruce	9	N	Satisfactory	2
12	betula	(2 trees) Birch	8	N	Poor	2
13	p. menziesii	Douglas-Fir	46	N	Satisfactory	19
14	p. menziesii	Douglas-Fir	50	N	Satisfactory	21
15	p. menziesii	Douglas-Fir	46	N	Satisfactory	19
16	p. menziesii	Douglas-Fir	30	N	Satisfactory	11
17	p. menziesii	Douglas-Fir	41	N	Fair	17
18	acer	Bigleaf Maple (twin stem)	15	N	Poor	4
19	p. menziesii	Douglas-Fir	50	N	Fair	21
20	p. menziesii	Douglas-Fir	30	N	Dead	11
21	crataegus	Hawthorn	8	N	Satisfactory	2
22	fraxinus	Ash	8	N	Satisfactory	2
23	crataegus	Hawthorn	8	N	Satisfactory	2
24	fraxinus	Ash	24	N	Satisfactory	8
25	crataegus	Hawthorn	8	N	Satisfactory	2
26	p. menziesii	Douglas-Fir	46	N	Satisfactory	19
27	crataegus	Hawthorn	6	N	Satisfactory	2
28	quercus	White Oak	6	N	Fair	2
29	crataegus	Hawthorn	6	N	Satisfactory	2
30	p. menziesii	Douglas-Fir	50	N	Satisfactory	21
31	p. menziesii	Douglas-Fir	28	N	Poor	20
32	fraxinus	Ash	6	N	Satisfactory	2
33	fraxinus	Ash	6	N	Satisfactory	2
34	fraxinus	Ash	7	N	Satisfactory	2

Tree Number	Species	Common Name	DBH "	Retention Y/N	Condition	Tree Units
35	fraxinus	Ash (twin stem)	50	N	Satisfactory	21
36	fraxinus	Ash	10	N	Satisfactory	2
37	fraxinus	Ash (twin stem)	19	N	Satisfactory	6
38	salix	Willow	10	N	Poor	2
39	fraxinus	Ash (twin stem)	42	N	Satisfactory	17
40	fraxinus	Ash	7	N	Satisfactory	2
41	fraxinus	Ash	7	N	Satisfactory	2
42	fraxinus	Ash	9	N	Satisfactory	2
43	fraxinus	Ash	8	N	Satisfactory	2
44	fraxinus	Ash	10	N	Satisfactory	2
45	quercus	White Oak	32	Y	Satisfactory	12
46	fraxinus	Ash	7	N	Satisfactory	2
47	quercus	White Oak	28	N	Fair	10
48	fraxinus	Ash (twin stem)	33	N	Satisfactory	13
49	fraxinus	Ash (multi stem)	22	Y	Satisfactory	7
50	fraxinus	Ash (twin stem)	38	N	Fair	15
51	populas	Cottonwood	48	N	Satisfactory	20
52	populas	(14 tree grove) Cottonwood	188	Y	Satisfactory	90
53	populas	(8 tree grove) Cottonwood	116	N	Satisfactory	54
54	quercus	White Oak	20	Y	Fair	6
55	p. menziesii	Douglas-Fir	38	Y	Satisfactory	15
56	p. menziesii	Douglas-Fir	28	Y	Satisfactory	10
57	fraxinus	Ash	18	Y	Fair	5
58	fraxinus	Ash	25	Y	Fair	9



TREE PLAN

EXISTING CONDITIONS &
PROPOSED SITE PLAN

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain II
SITE LOCATION: 22015 & 22111 NE Goodwin Rd., Camas, WA

COUNTY: Clark **STATE:** ~~WA~~
FIGURE: 1
DATE: 6-24-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-061625.dwg

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

Landing at Green Mountain 2 Subdivision

2. Name of applicant: [help]

Pacific Lifestyle Homes – Nick Edwards

3. Address and phone number of applicant and contact person: [help]

11815 NE 99th Street Suite 1200
Vancouver, WA 98682
360-597-7098

4. Date checklist prepared: [help]

June 12, 2025

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval, likely in early 2026. No phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical Areas Report

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No, the applicant is not aware of any other applications pending for governmental approvals that affect this site.

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type III Subdivision Review*
- *Public notification and staff report publications*

- *Final Plat Approval*
- *SEPA*
- *SWWPPP - Stormwater Pollution Prevention Plan*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes a 34-lot single family residential subdivision in the R-7.5 zone on 9.60 acres. One existing home will be retained on Lot 34. N 82nd Avenue will be extended from the east and new public roads will be provided to serve the site.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 22015 & 22111 NE 28th St. Camas, WA, in the SW 1/4 of Section 21, Township 2 North, Range 3 East of the Willamette Meridian. The site is identified as Tax Parcels 611175000, 173177000, 173210000. See the proposed development plans for a preliminary plat, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

10%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site consists of:
MlA – McBee silt loam (0-3% slopes)
LgB – Lauren gravelly loam (0-8% slopes)
LeB – Lauren loam (0-8% slopes)
It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of public roads, driveways, the installation of utilities, and the preparation of the site for single family residential housing. Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time; these will be established with the Final Engineering Plans.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 50%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal household activities, possibly including wood burning stoves and fireplaces.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are off-site sources of emissions from cars that travel adjacent roads. The site is near Grove Airfield, and as such may experience overhead flights, odor, vibrations, noise and other similar aviation impacts. This will not affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

Per the Critical Areas Report for the site there is an offsite Category II wetland to the south of the site. A small portion of the wetland buffer extends over the SW corner of the site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

No

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

None, no impacts are proposed to the offsite wetland.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. A storm detention pond is proposed with the site development that will discharge stormwater into the nearby wetland. Storm water from pollution generating surfaces will be treated prior to being routed to the storm detention pond.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will be runoff from impervious roof area, driveways, roadways, and landscaped areas. Street catch basins, yard drains, and roof drains will connect to a pipe network that leads to the detention pond.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

The contractor will be required to use approved erosion control measures during all phases of development in order to reduce or control runoff.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, maple, aspen, **other: Oregon white oak, ash, hazelnut**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
____ grass
x pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
x other types of vegetation: **blackberry**

b. What kind and amount of vegetation will be removed or altered? [help]

Much of the site vegetation will be stripped for site preparation. Trees along the south portion of the site are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There are priority habitat Oregon white oaks onsite.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Street trees and landscaping will be provided throughout the park and open space areas. All Oregon white oaks will be preserved. The southern portion of the site will feature an open space tract that will contain the wetland buffer, stormwater facility, oak tree, and public path. This tract will be landscaped.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:
birds: **hawk**, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The future homes will likely be landscaped with grass lawns and appealing native shrubs and trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The new homes on the site will be served primarily by electricity and natural gas. Wood stoves might be used for heating. Other forms of energy will depend on homeowners.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The new homes will have energy-efficient windows and will comply with the state building codes which includes conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

There are no known environmental health hazards that could occur as a result of this proposal.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.25 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

None known

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

None known

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a residential area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

None

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads exist in the area, along with typical household noises. The site is near Grove Airfield, and as such may experience overhead flights, odor, vibrations, noise and other similar aviation impacts. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises from this project will include construction noises which would occur only during approved hours as mandated by City of Camas and Washington State. Long-term noises could include an increase in traffic noise and normal household noises.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City of Camas.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has three existing single-family residences and several outbuildings onsite. To the south is Camp Currie, park land owned by Clark County. To the west of the site are single family homes on larger lots. To the east and north are residential subdivisions.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

It is unknown whether the site has a history of being used as working farmlands or forest lands.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

Three single-family residences and several outbuildings exist onsite.

d. Will any structures be demolished? If so, what? [help]

The manufactured home on parcel 173210000 and associated outbuildings will remain on proposed lot 34. All other structures will be demolished.

e. What is the current zoning classification of the site? [help]

R7.5 – Residential

f. What is the current comprehensive plan designation of the site? [help]

SFM

g. If applicable, what is the current shoreline master program designation of the site? [help]

Not applicable, the site is not within a shoreline area.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There are Oregon white oaks on site. A wetland buffer extends onto the SW corner of the site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that this development will contain 34 lots/homes. At 2.8 people per household, there will be a total of approximately 95 people residing within this development at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

The removal of one home could displace up to 3 people.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

The proposal will provide 33 new single-family homes.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

There are no known impacts.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

33 new homes are proposed, one existing home will remain. The type of proposed housing is unknown at this time.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

One unit will be eliminated.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new home construction will meet City of Camas building codes for residential housing development and not exceed height limits of 35'. Exterior building materials are unknown.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from large-lot single family residences to a development with 34 single family homes.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The future single-family homes will be landscaped with grass lawns and other appealing landscaping. The main roadway frontage will be landscaped with trees per the City of Camas roadway standards. An *open space on the south end of the site is proposed to be retained within the development*. This open space will preserve onsite trees include the trees in the wetland buffer and an Oregon white oak.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When homes are constructed on the proposed lots, there will most likely be light produced from houses, yards, and street lights during evenings and early mornings.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal. The site is near Grove Airfield, and as such may experience overhead flights, odor, vibrations, noise and other similar aviation impacts.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Shielding of porch lights and streetlights will reduce light and glare impacts offsite.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camp Currie park is adjacent to the south, Lacamas Heritage Trail and Camas Meadows Golf Club are located to the southwest.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

The applicant proposes to pay all park impact fees associated with building permits. A 0.83-acre open space tract is proposed on the south end of the site that will provide recreation opportunities.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

Archaeological Services, LLC (ASCC) recommends that the ca. 1962 residence at 22111- A NE 28th Street be recorded on a Historic Property Inventory (HPI) prior to its demolition.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

There are no known landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site. An Archaeological Predetermination Survey was performed by Archaeological Services, LLC for onsite work. The onsite study found no cultural materials.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, no further archaeological work is needed. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

Access to the site will be from N 82nd Avenue from the east. New residential roads will be constructed to serve the development. Proposed street layouts are shown on the preliminary plat.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is at SE 192nd Avenue and Mill Plain Blvd. approximately 2.9 miles to the southwest.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

Approximately 2-4 parking spaces per single-family home are proposed. This project will eliminate approximately 4 parking spaces with the removal of two existing homes. Street parking will be allowed on one side of the proposed residential roadway.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 28th Street up to half-width roadway standards. The construction of this project also proposes to construct internal public roadways to serve the proposed lots and provide circulation to potential future developments. See the preliminary plat for proposed roadway alignments.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

It is anticipated that 310 trips per day would be generated by the project. It is expected that 23 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 31 trips will occur in the PM peak hour (4:00 – 6:00).

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development and the construction of new homes will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for schools, traffic, and parks at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Signed by: Nick Edwards B4B8362C57AF4B0...
Name of signee Nick Edwards
Position and Agency/Organization Land Entitlements Project Manager Pacific Lifestyle Homes
Date Submitted: 7/7/2025

The Landing at Green Mountain 2

Located in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

APPLICANT:
Pacific Lifestyle Homes
Contact: Spencer Vetter
11815 NE 99th St
Vancouver, WA 98682
(360) 597-7098
NickE@buildplh.com

OWNER:
Emmert Family III LLC
10470 SE Hillcrest Dr
Happy Valley, OR 97086

Linda Middagh
22015 NE 28th Street
Camas, WA 98607

PROJECT CONTACT:
PLS Engineering
Jayson Taylor, PE
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173177-000
22111 NE 28th Street
Camas, WA 98607

LAND USE:
The applicant is proposing a 34 lot subdivision in the R7.5 zone.

Per Municipal Code section 18.09.060, density transfer is proposed with the inclusion of a park area that has 0.5 acres of contiguous area. We are requesting flexibility to the minimum lot width standards with the proposed park area.

There is currently a single-family home, a mobile home and several outbuildings on site many of which will be removed. The site is primarily field grass with landscaping and scattered trees. The site is bordered by NE 28th Street and Green Mountain Subdivision to the north, the recently platted Monte Verde Subdivision (SUB22-05) to the east, a single-family residence to the west and Camp Currie to the south. A BPA right-of-way runs diagonally through the site.

Existing Lot Area = 9.6 Acres
Proposed open space = 1.06 Acres
Minimum Proposed Lot Area = 5000 sq-ft
Maximum Proposed Lot Area = 41512 sq-ft
Average Lot Area = 5824 sq-ft (excluding parent parcel)
Min. Lot Width = 50'
Proposed Density = 3.62 d.u./net acre (34 lots)

ENVIRONMENTAL CONSTRAINTS:
There are four Oregon White Oak trees located onsite. One tree is proposed to be removed. There is also a wetland buffer that extends onto the site that affects the SW corner of the site.

There are no known water courses or water bodies, no areas within 100-year floodplain, no designated shoreline areas, no landslide or erosion hazard areas no known significant historic resources onsite.

TRANSPORTATION
For primary access to the site the applicant is proposing to construct a roadway connection to N 82nd Street that was recently constructed by the project to the east. NE 28th Street is classified as a 3-land collector/arterial. Half width improvements are proposed for this public roadway. Internal public roadways will consist of local access roadways.

UTILITIES:

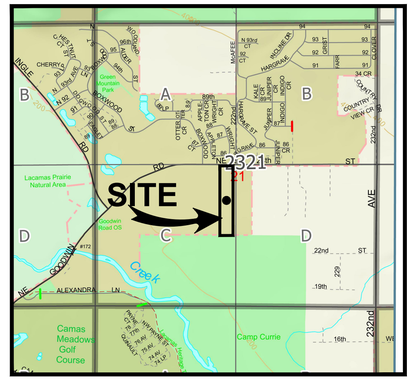
Stormwater runoff is proposed to be collected and routed to a detention facility located on the south end of the site, runoff generated from pollution generating surfaces will be treated using filter cartridges prior to entering the stormwater facility.

The site will be served by public water and sanitary sewer provided by the City of Camas. Due to the existing grade of the site that slopes away from NE 28th Street, a majority of the lots will need to utilize a grinder pump system.

There is an existing well and septic system located on the site that are proposed to be removed/abandoned.

SITE STATISTICS		
ZONE: R7.5		
Site Area	417,959 SQ FT	9.6 AC
Right of Way Dedication	95,530 SQ FT	2.19 AC
Critical Areas	9,840 SQ FT	0.23 AC
Net Area (Site Area - Critical Areas)	408,118 SQ FT	9.37 AC
Total Lots	34	
	REQUIRED	PROPOSED
Density (Net Acreage/Total Lots)	5.8 Max	3.62
Maximum Building Lot Coverage	40%	55%
Single Story Homes	-	55%
Two Story Homes	-	50%

Proposed Setbacks	
Front Yard	15'
Side Yard	5'
Rear Yard	15'
Garage	20'
Street Side Yard	10'



VICINITY MAP
NOT TO SCALE

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Wood Chips	
Proposed Gravel	
Proposed Cut	
Retaining Wall	

Scale 1" = 50'
50 25 0 50

Know what's below. Call before you dig.

ENGINEERING | PLS

Preliminary Plat For:

The Landing at Green Mountain 2

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6

Project No.	3886
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	CHJ
DRAFTED BY:	MJB
REVIEWED BY:	TGJ

02
04

1001

The Landing at Green Mountain 2

Located in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

APPLICANT:
Pacific Lifestyle Homes
Contact: Spencer Vetter
11815 NE 99th St
Vancouver, WA 98682
(360) 597-7098
NickE@buildplh.com

OWNER:
Emmert Family III LLC
10470 SE Hillcrest Dr
Happy Valley, OR 97086

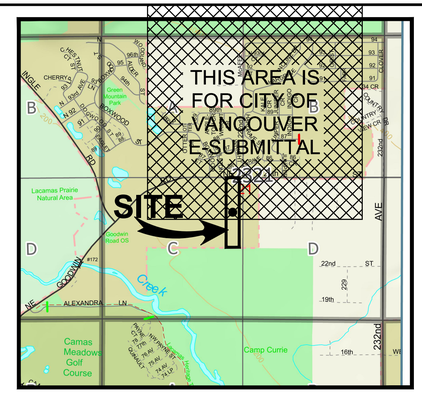
Linda Middagh
22015 NE 28th Street
Camas, WA 98607

PROJECT CONTACT:
PLS Engineering
Jayson Taylor, PE
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173177-000
22111 NE 28th Street
Camas, WA 98607

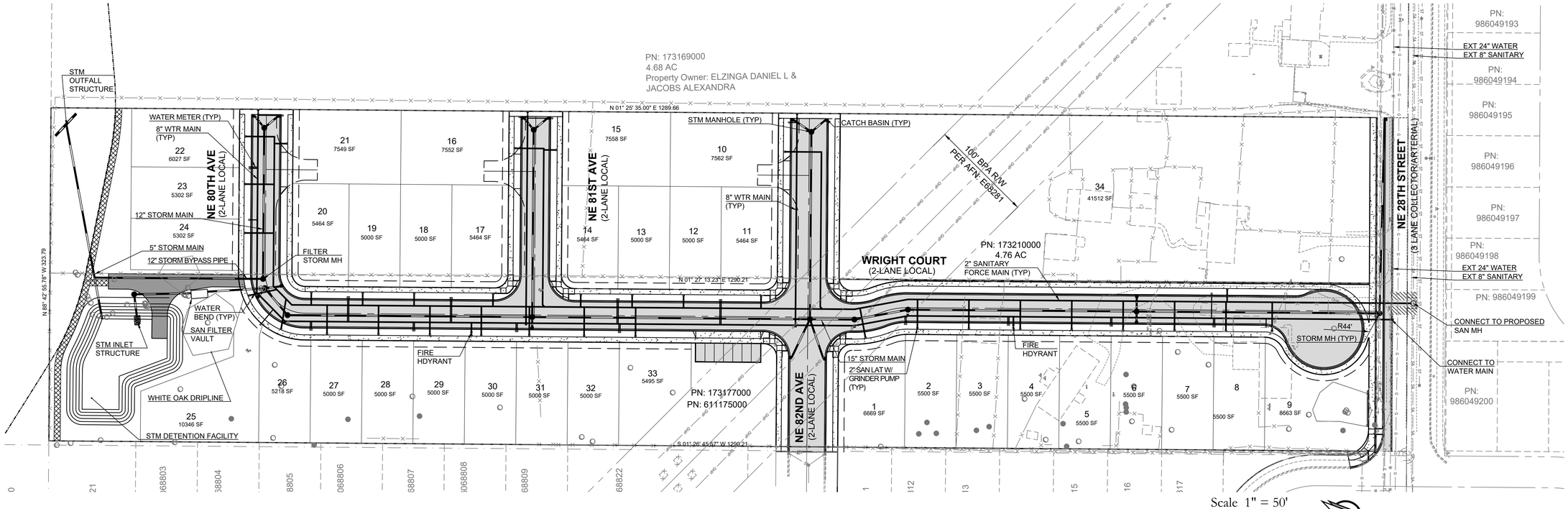
Parcel # 611175000
22111 NE 28th Street
Camas, WA 98607

Parcel # 173210000
22015 NE 28th Street
Camas, WA 98607



VICINITY MAP
NOT TO SCALE

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Wood Chips	
Proposed Gravel	
Proposed Cut	
Retaining Wall	



Scale 1" = 50'
50 25 0 50

811 Know what's below. Call before you dig.

PLS ENGINEERING

Utility Plan For:

The Landing at Green Mountain 2

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6

Project No.	3886
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	CIH
DRAFTED BY:	MJB
REVIEWED BY:	TGJ

03
04

1002

The Landing at Green Mountain 2

Located in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

GENERAL NOTES

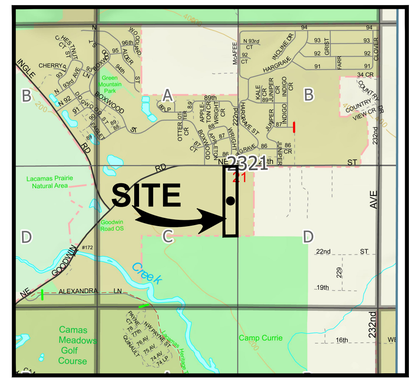
APPLICANT:
Pacific Lifestyle Homes
Contact: Spencer Vetter
11815 NE 99th St
Vancouver, WA 98682
(360) 597-7098
NickE@buildplh.com

OWNER:
Emmert Family III LLC
10470 SE Hillcrest Dr
Happy Valley, OR 97086

Linda Middagh
22015 NE 28th Street
Camas, WA 98607

PROJECT CONTACT:
PLS Engineering
Jayson Taylor, PE
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

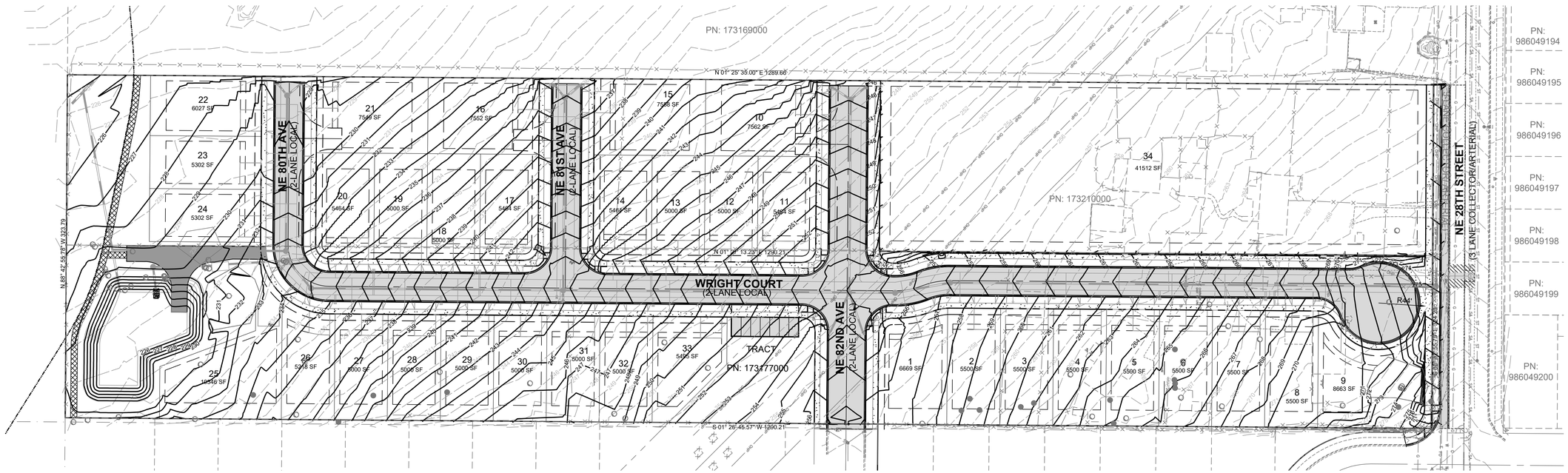
SITE ADDRESS:
Parcel # 173177-000
22111 NE 28th Street
Camas, WA 98607



VICINITY MAP
NOT TO SCALE

Legend	
Proposed Asphalt Concrete	
Proposed Cement Concrete	
Proposed Wood Chips	
Proposed Gravel	
Proposed Cut	
Retaining Wall	

UNADJUSTED VOLUMES	
CUT	6,832 CY
FILL	9,126 CY



Scale 1" = 50'
50 25 0 50

811 Know what's below. Call before you dig.

PLS ENGINEERING

Grading Plan For:

The Landing at Green Mountain 2

A Subdivision Located In The City Of Camas, Washington

Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

Revisions

1	2	3	4	5	6

Project No. 3886	
SCALE:	H: 1" = 50' V: N/A
DESIGNED BY:	CIH
DRAFTED BY:	MJB
REVIEWED BY:	TGJ

04
04

1003

The Landing at Green Mountain 2

Located in the SW ¼ of Section 21, T2N, R3E, W.M.
Camas, Washington

HORIZONTAL DATUM:
NAD 83 (2011)
WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, U.S SURVEY FEET. BASED ON REAL TIME KINEMATIC CORRECTIONS FROM THE WASHINGTON STATE REFERENCE NETWORK.

VERTICAL DATUM:
NGVD29(47) CLARK COUNTY DATUM

Sheet Index	
1.	Existing Conditons
2.	Preliminary Plat
3.	Utility Plan
4.	Grading Plan
5.	Landscape Plan
6.	Landscape Plan

GENERAL NOTES

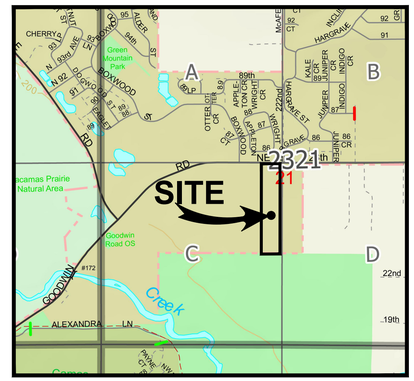
APPLICANT:
Pacific Lifestyle Homes
Contact: Spencer Vetter
11815 NE 99th St
Vancouver, WA 98682
(360) 597-7098
NickE@buildplh.com

OWNER:
Emmert Family III LLC
10470 SE Hillcrest Dr
Happy Valley, OR 97086

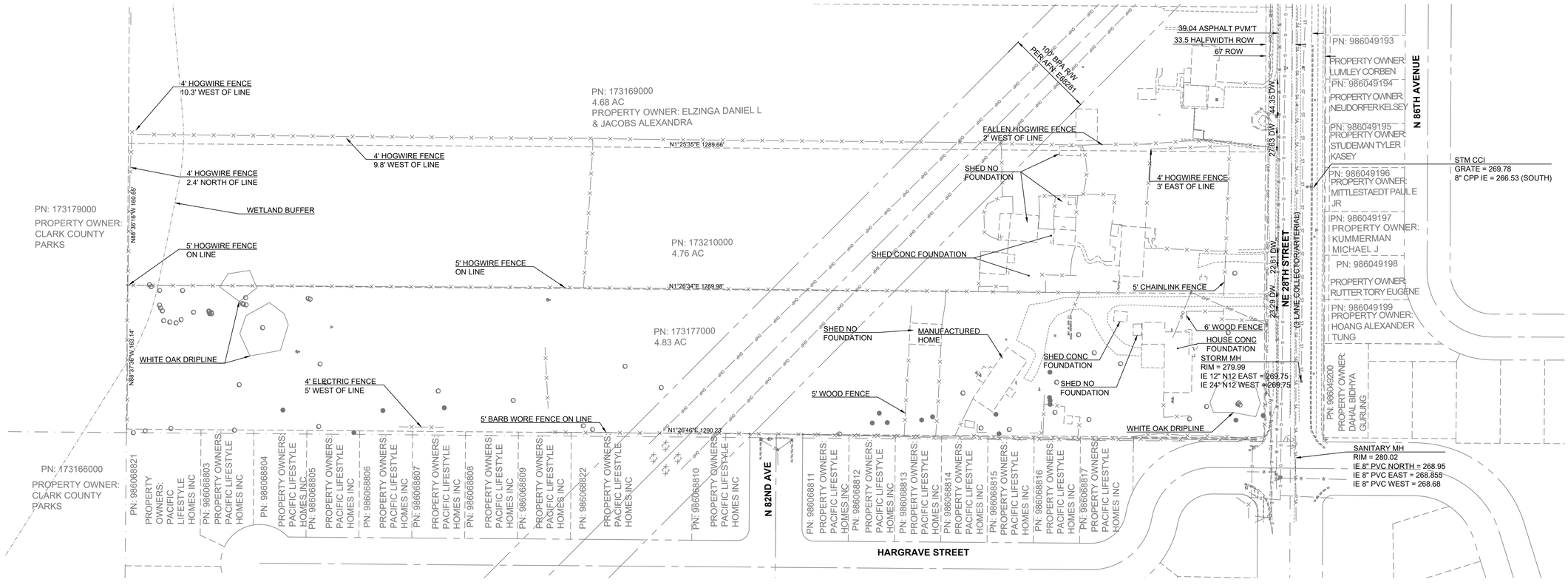
Linda Middagh
22015 NE 28th Street
Camas, WA 98607

PROJECT CONTACT:
PLS Engineering
Jayson Taylor, PE
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

SITE ADDRESS:
Parcel # 173177-000
22111 NE 28th Street
Camas, WA 98607



VICINITY MAP
NOT TO SCALE



Scale 1" = 60'
60 30 0 60

Existing Conditions For:
The Landing at Green Mountain 2
A Subdivision Located In The City Of Camas, Washington

ENGINEERING | PLS
Engineering - Surveying - Planning | 604 W. Evergreen Blvd., Vancouver, WA 98660 | PH (360) 944-6519 | Fax (360) 944-6539

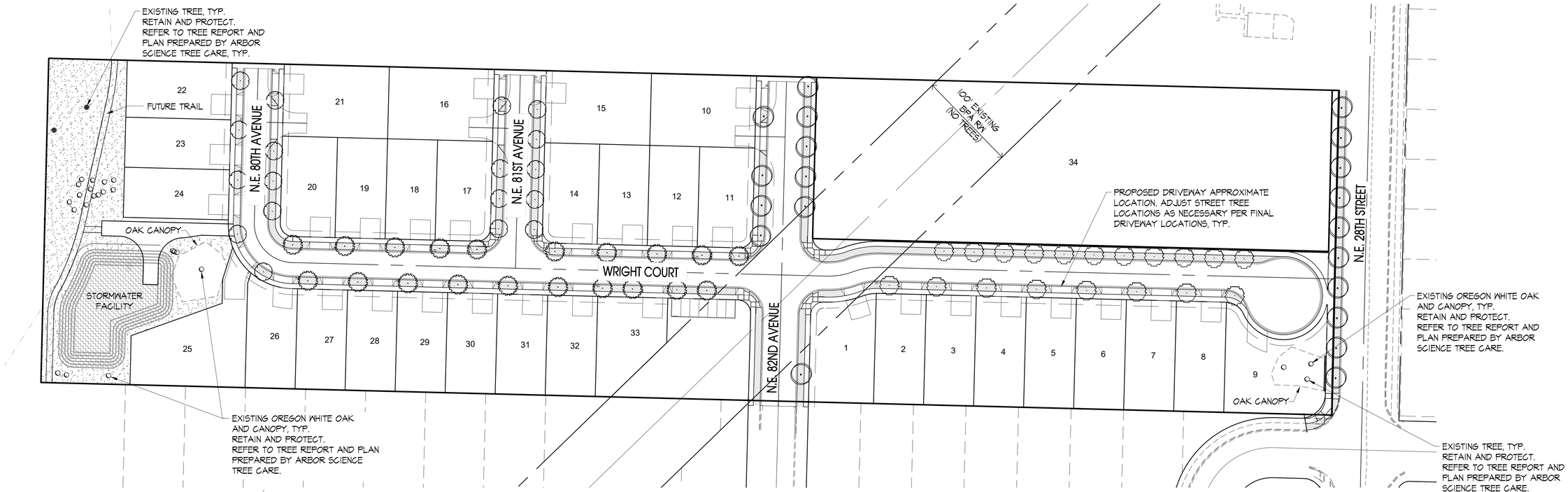
Revisions

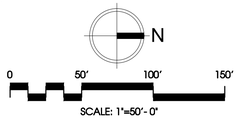
1	
2	
3	
4	
5	
6	

Project No.	3886
SCALE:	H: 1" = 60' V: N/A
DESIGNED BY:	CIH
DRAFTED BY:	MJB
REVIEWED BY:	TGJ

01
04

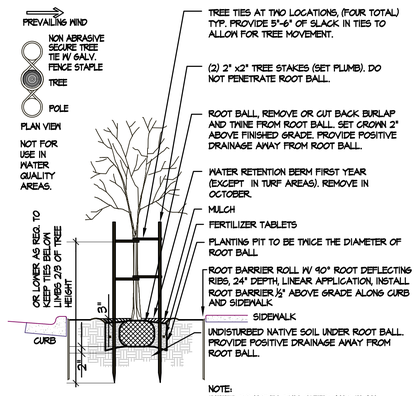
1004



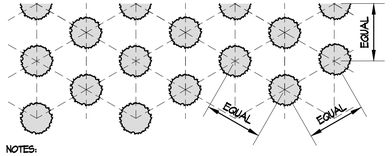


PLANTING NOTES

1. ALL BOUNDARIES, EASEMENTS, UTILITIES AND LEGAL ENCUMBRANCES TO BE CONFIRMED WITH OWNER PRIOR TO BEGINNING WORK. PROPERTY LINES AND SURVEY INFORMATION PROVIDED BY PLS ENGINEERING.
2. IN NO WAY IS THIS PLAN TO BE INTERPRETED TO EXCEED THE LEGAL BOUNDARIES OF THE OWNER'S REAL PROPERTY.
3. THE LANDSCAPE DESIGNER ASSUMES NO RESPONSIBILITY FOR THE LOCATION OF BOUNDARIES, UTILITIES AND WETLANDS.
4. THIS PLAN SHALL BE INSTALLED TO MEET ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL CODES.
5. THIS PLAN SHALL BE CONSIDERED PRELIMINARY UNTIL APPROVED BY ALL GOVERNING AGENCIES. IMPLEMENTATION OF THIS PLAN SHALL NOT PROCEED UNTIL ISSUANCE OF ALL RELATED PERMITS.
6. PLANT QUANTITIES ARE FOR INFORMATION ONLY. IN CASE OF ANY DISCREPANCY, THE PLAN SHALL GOVERN.
7. ALL WORK IS TO BE PERFORMED BY LICENSED CONTRACTORS AND EXPERIENCED WORKERS.
8. THE CONTRACTOR IS TO VERIFY THE LOCATION OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES PRIOR TO PERFORMING ANY EXCAVATION. CONTRACTOR SHALL REPAIR ANY DAMAGE TO UTILITIES CAUSED BY THE CONTRACTOR'S WORK, AT NO ADDITIONAL COST TO THE OWNER. CONTACT ALL UTILITY PROVIDERS SERVING THE SITE AREA 48 HOURS PRIOR TO ANY EXCAVATION.
9. ALL PLANT MATERIALS SHALL MATCH SPECIFICATIONS PER SPECIES AND SHALL COMPLY WITH ANSI Z60.1 'STANDARD FOR NURSERY STOCK'.
10. THE CONTRACTOR SHALL ADHERE TO THE WASHINGTON ASSOCIATION OF NURSERYMEN'S GUIDELINES FOR PLANTING PRACTICES.
11. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING ELEMENTS ON AND OFF SITE, RESULTING FROM THE CONTRACTOR'S WORK.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE VIABILITY OF ALL PLANT MATERIAL FOR 2 YEARS AFTER COMPLETION OF PLANTING. DISEASED, DYING, OR DEAD PLANT MATERIAL SHALL BE REPLACED BY THE CONTRACTOR DURING THE TWO YEAR PERIOD AND MAINTAINED FOR AN ADDITIONAL 2 YEAR PERIOD.
13. IMMEDIATELY UPON BID AWARD, CONTRACTOR SHALL SECURE THE PLANT MATERIALS AS SPECIFIED FROM AVAILABLE SOURCES. IN THE EVENT THAT PLANT MATERIALS ARE NOT AVAILABLE, CONTACT LANDSCAPE ARCHITECT FOR APPROVED SUBSTITUTIONS. NO SUBSTITUTION FOR PLANT MATERIAL WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
14. TOP DRESS ALL SHRUB AND GROUND COVER AREAS (NOT LAWN) WITH 3" OF FIR BARK MULCH. SUBMIT SAMPLE TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO CONSTRUCTION.
15. TREE LOCATIONS MAY BE ADJUSTED IN THE FIELD TO SUIT SITE REQUIREMENTS AS DIRECTED BY THE LANDSCAPE ARCHITECT.
16. THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATED PLANTING PITS HAVE POSITIVE DRAINAGE. PLANT PITS FULLY FLOODED WITH WATER SHALL DRAIN WITHIN (12) HOURS OF FILLING.
17. FINISH GRADE SHALL BE SET TO ALLOW POSITIVE DRAINAGE
18. ROTOTILL 2" OF COMPOST INTO ALL PLANTED AREAS.
19. INCORPORATE PEAT INTO THE ROOT ZONE OF RHODODENDRONS, AZALEAS AND OTHER ACID LOVING PLANTS.
20. INCORPORATE 10-20-20 FERTILIZER INTO THE ROOT ZONE OF ALL NEW PLANTINGS.
21. RONSTAR, OR APPROVED EQUAL, PREEMERGENT HERBICIDE TO BE APPLIED TO ALL PLANTED AREAS PER MANUFACTURERS INSTRUCTIONS.
22. EXISTING VEGETATION TO BE SPRAYED WITH ROUNDUP, OR APPROVED EQUAL, PER MANUFACTURERS INSTRUCTIONS. SUFFICIENT TIME SHALL BE GIVEN TO ALLOW EXISTING MATERIAL TO DIE. CROWN LAWN AREAS AND GRADE TO PROVIDE POSITIVE DRAINAGE.
23. ROLL LAWN AREA TO INSURE PROPER COMPACTION TO MINIMIZE SETTLING.
24. AMEND SOIL IN LAWN AREAS WITH 80 LBS. OF DOLOMITE LIME AND 40 LBS. OF 10-20-20 SLOW RELEASE FERTILIZER OR EQUIVALENT. PROVIDE A 3" LAYER OF SANDY LOAM TOPSOIL FOR LAWN AND BED AREA.
25. SEED LAWN AREAS WITH GRASS SEED MANUFACTURER'S RECOMMENDATIONS. COVER SEED WITH FINE MULCH APPLIED WITH ROLLER OR HYDROSEED.
26. THE PROPERTY OWNER IS RESPONSIBLE FOR MAINTAINING TURF PLANTED WITHIN THE RIGHT OF WAY.
27. PLANT MATERIAL SHALL BE PLANTED W/ ROOT CROWN 1" ABOVE FINISHED GRADE TO ALLOW POSITIVE DRAINAGE AWAY FROM CROWN.
28. STAKE ALL TREES OVER 6 FT. IN HEIGHT PER DETAILS ON THIS SHEET.
29. REFER TO DETAILS FOR ADDITIONAL INFORMATION.
30. ALL PLANTING SHALL BE HAND WATERED OR IRRIGATED BY AN AUTOMATIC UNDERGROUND SPRINKLER SYSTEM.
31. ALL PLANT MATERIALS FURNISHED ARE TO BE HEALTHY, UNIFORMLY BRANCHED AND WITH WELL DEVELOPED FIBROUS ROOT SYSTEMS.
32. ALL PLANT MATERIALS FURNISHED ARE TO BE FREE FROM DEAD OR BROKEN BRANCHES, LICHENS, SCARS, BROKEN BARK OR WOUNDS. ALL PLANT MATERIALS WILL BE INSECT, WEED, AND DISEASE FREE ACCORDING TO THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF AGRICULTURE FOR NURSERY PLANT MATERIALS SOLD FOR WHOLESALE OR RETAIL. ALL PRUNING WOUNDS MUST BE WELL HEALED WITH NO EVIDENCE OF DECAY.
33. FIELD CONFIRM ALL SITE CONDITIONS, AREAS AND SIZES PRIOR TO BIDDING & CONSTRUCTION. DO NOT SCALE FROM PLANS.



A B & B Tree Planting Detail
Not To Scale — SECTION / PLAN VIEW



NOTES:

ALL GROUND COVER SHALL BE PLANTED AT EQUAL TRIANGULAR SPACING AS SPECIFIED IN PLANTING LEGEND.

GROUND COVER TO BE LOCATED ONE HALF OF SPECIFIED SPACING DISTANCE FROM ANY HARD SURFACE, UNLESS OTHERWISE SPECIFIED.

B Ground Cover Planting Detail
Not To Scale — PLAN VIEW

PLANT LEGEND

SYMBOL	BOTANICAL / COMMON NAME	SIZE	QUANTITY	TREE UNITS
TREES				
	EXISITNG TREES - RETAIN & PROTECT PER PLANS.	SEE TREE REPORT		204
	ACER TRUNC. X A. PLAT.'WARREN RED' PACIFIC SUNSET MAPLE	2" cal.	20	20
	CARPINUS CAROLIN. 'NATIVE FLAME' NATIVE FLAME AMERICAN HORNBEAM	2" cal.	19	19
	PARROTIA PERSICA 'VANESSA' VANESSA PERSIAN PARROTIA	2" cal.	18	18
	ZELKOVA SERRATA 'CITY SPRITE' CITY SPRITE ZELKOVA	2" cal.	20	20
	TOTAL TREES PLANTED		77	
	TOTAL TREE UNITS			281
GROUNDCOVER				
	ARCTOSTAPHYLOS UVA URSI / KINNIKINNICK	1 GAL.	36" O.C.	
	TURF, DROUGHT RESISTANT, SUN & SHADE MIX AND/OR LANDSCAPE PER OWNER			
STORMWATER DETENTION FACILITY				
	GRASS SEED PER CIVIL PLANS			

STREET TREE LOCATIONS TO BE ADJUSTED PER FINAL DRIVEWAY PLAN, TYP.

REQUIRED TREE DENSITY

	SITE AREA	REQUIRED TREE UNITS / ACRE DISTURBED	TOTAL REQUIRED TREE UNITS
	9.54± AC	20	191.8

TREE DENSITY SUMMARY

EXISTING TREE UNITS RETAINED	204
TREE UNITS PROPOSED TO PLANT	77
TREE UNITS PROVIDED	281

IRRIGATION NOTE

ALL LANDSCAPE AREAS SHALL BE HAND WATERED OR IRRIGATED WITH AN AUTOMATIC DRIP AND/OR SPRAY IRRIGATION SYSTEM. REFER TO CIVIL ENGINEERING PLANS FOR WATER SOURCE.

Planning Solutions, Inc.
Creating Solutions to Complex Issues
4400 NE 77th Avenue
Suite 275
VANCOUVER, WA 98662
VOICE: 360-750-9000 FAX: 360-713-6102
www.planningsolutionsinc.com

STATE OF WASHINGTON · CHRISTOPHER A. BROWN · LICENSED LANDSCAPE ARCHITECT · EXPIRES: 10/13/2025

PRELIMINARY
NOT FOR CONSTRUCTION
SUBJECT TO APPROVAL

THE LANDING AT GREEN MOUNTAIN 2

22111, 22007, 22015 NE 28th Street
Camas, Washington

DRAWN: VH | CHECKED: GB
SCALE: 1" = 50'-0" | DATE: 07.31.25
JOB #: 25-1976
ISSUED FOR: PLR
REVISIONS:
1
2
3
4
5
6
7

SHEET NAME:
PRELIMINARY LANDSCAPE PLAN

SHEET #: L1

SHEET | OF | 1005

© COPYRIGHT 2025, PLANNING SOLUTIONS, INC., NO PART OF THIS DRAWING MAY BE COPIED OR REPRODUCED WITHOUT WRITTEN PERMISSION OF PLANNING SOLUTIONS, INC.

DISCLAIMER AND LIMITATIONS: ANY WORK CONTAINED HEREIN INCLUDING BUT NOT LIMITED TO PLANS AND DOCUMENTS ARE INSTRUMENTS OF SERVICE INTENDED FOR USE SOLELY WITH RESPECT TO THIS PROJECT. ALL WORK SHALL BE CONSIDERED CONCEPTUAL AND SUBJECT TO CHANGE. THESE INSTRUMENTS OF SERVICE SHALL BE CONSIDERED A WORK IN PROGRESS WHERE UNKNOWN FACTORS EXIST AND JURISDICTIONAL REQUIREMENTS HAVE NOT BEEN VERIFIED. DUE TO THE HIGH DEGREE OF UNCERTAINTY ASSOCIATED WITH A CONCEPTUAL DESIGN, THESE INSTRUMENTS OF SERVICE SHALL NOT BE USED AS THE BASIS FOR A FINANCIAL EVALUATION OR CONSTRUCTION COST ESTIMATING. NO ASSURANCES ARE OFFERED OR IMPLIED AS TO THE OVERALL FEASIBILITY OF THE PROJECT. ALL WORK SHALL BE SUBJECT TO REVIEW AND FINAL APPROVAL BY ALL APPROPRIATE FEDERAL, STATE AND LOCAL AGENCIES AND SHALL CONTAIN THE PROFESSIONAL SEAL AND SIGNATURE OF ALL REQUIRED DESIGN PROFESSIONALS PRIOR TO ANY USE OF THESE DOCUMENTS. PLANNING SOLUTIONS, INC. AND ITS CONSULTANTS SHALL BE DEEMED THE AUTHORS AND OWNERS OF THEIR RESPECTIVE INSTRUMENTS OF SERVICE AND SHALL RETAIN ALL COMMON LAW, STATUTORY AND OTHER RESERVED RIGHTS, INCLUDING COPYRIGHTS.

PRELIMINARY TECHNICAL INFORMATION REPORT

The Landing at Green Mountain 2

City of Camas, Washington

Prepared by:
PLS Engineering
Consulting Engineers and Planners
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519
pm@plsengineering.com

Prepared for:
Pacific Lifestyle Homes
11815 NE 99th St Suite 1200
Vancouver, WA 98682

Prepared: July 2025
Revised: August 2025

TABLE OF CONTENTS

CERTIFICATE OF ENGINEER....1

SECTION A – PROJECT OVERVIEW....2

SECTION B – MINIMUM REQUIREMENTS....3

SECTION C – SOILS EVALUATION....4

SECTION D – SOURCE CONTROL....4

SECTION E – ON-SITE STORMWATER MANAGEMENT BMPS....5

SECTION F – RUNOFF TREATMENT ANALYSIS AND DESIGN....6

SECTION G - FLOW CONTROL ANALYSIS AND DESIGN....6

SECTION H – WETLAND PROTECTION....8

SECTION I – OTHER PERMITS....16

SECTION J – CONVEYANCE SYSTEMS ANALYSIS AND DESIGN....16

SECTION K – SPECIAL REPORTS AND STUDIES....16

SECTION L –OPERATIONS AND MAINTENANCE MANUAL....17

Technical Appendices:

Appendix A: Maps

- **Vicinity Map**
- **Soils Map**
- **Critical Areas Map**
- **Basin Maps**

Appendix B: Design Calculations & Modeling

Appendix C: Geotechnical Report

Appendix D: Operations and Maintenance Manual

Appendix E: Construction Stormwater Pollution Prevention Plan (SWPPP)

Appendix F: Environmental Documentation

CERTIFICATE OF ENGINEER

The Landing at Green Mountain 2

Technical Information Report

The technical information and data contained in this report was prepared under the direction and supervision of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.



This document was prepared by:

Calvin Hillman-Johnson

Section A – Project Overview

Section A.1 – Site Information

This project will comply with current City of Camas Standards from Stormwater and Erosion Control per CMC Title 14. The Final Grading / Erosion Control / Drainage Plans have been prepared by the project civil engineer, PLS Engineering, Inc. The site will be served by public sewer and water provided by the City of Camas. This project phase proposes construction of 34 single-family residential lots with associated structured, access, paved storage areas, sewer, water, and storm drain connections. Access to the site is from N 82nd Ave.

The physical address of the site is currently in two lots, the East most lot being 22111 NE 28th St, Camas 98607 pin number 173177000 and the West most lot is 22015 NE 28th Street, Camas, WA 98607, pin number 173210000. The property is located in the southwest quarter of Section 21, T2N, R3E of the Willamette Meridian. The property is bordered by NE 28th Street on the north side, 5-acre single family lots to the West, an 8.63-acre subdivision to the East, and Clark County Parks to the South. The cumulative property area contains a total of 417,959.36 square feet (9.595 acres) with 2,308 square feet (0.053 acres) of right of way dedication, resulting in 415,651 square feet (9.542 acres) of developed area. This technical information report will address the stormwater runoff associated with the construction which will take place.

The topography of the site is moderately sloped from NE to SW, with elevation ranging from 280’ to 244’. Slopes are generally between 3% and 10%, The site slopes down from the relative high points in the NE corner towards the SW property corner. The site contains a 1,900 square foot manufactured home, a 1,500 square foot manufactured home, a 2,700 square foot home, a 1,300 square foot home, and several sheds of varying size. All structures in lot 34 are to remain, all other existing impervious surfaces on-site and homes are planned to be removed. There is an existing BPA easement along with some electrical power line towers that are that support the power lines that cross the site. This easement and associated structures will remain. The remainder of the stie is filled with grass, weeds, and a variety of trees. There are wetlands mapped on Clark County Maps at the SW corner of the site. Otherwise, there are no known water courses, areas prone to flooding, floodplains, shorelines areas, water bodies, unstable slopes, landslide hazard areas, habitat, critical areas, or historic sites located on the site. Site drainage follows the slope of the land going from the NE corner to the SW corner. Site discharge will not exceed historic rates.

After construction, the site will contain approximately 137,871 square feet of landscaped area. The remainder of the site is anticipated to be covered with impervious surfaces. This will include 188,088 square feet of roof area, 18,491 square feet of sidewalk, and 73,509 square feet of concrete and asphalt for driveways and drive aisles. Site stormwater will be routed to a detention pond that will release the runoff at rates less than existing in accordance with the SWMMWW. Frontage stormwater will route the through a vault and into the same detention pond as the rest of the site. Site stormwater runoff treatment for the site’s pollution generating impervious surfaces will be accomplished with media filter treatment cartridges in a vault before entering the detention pond. An area totaling 51,394 square feet (**1.1867** acres) will bypass the vault and detention pond and instead will be treated with cartridges in manholes which will then outfall through a flow spreader along with discharge from pond.

Section B – Minimum Requirements

Section B.2 – Determination of Applicable Minimum Requirements

After site development, disturbed impervious surfaces will cover approximately 280,088.4 square feet, or 67% of the disturbed project area; projects resulting in more than 5,000 square foot of hard surface area must meet all nine Minimum Requirements of the stormwater manual. The majority of the site will discharge to a detention pond, while the remainder of the site will bypass this pond and be directly discharged through a flow spreader at the same discharge point of the pond. Water flowing off of existing structures on lot 34 will be captured and directed to the pond. These will all be required to meet Minimum Requirements #6 and #7. The stormwater system is designed to comply with all City requirements for stormwater treatment and quantity control the treatment regulation require treatment of 91% of the total runoff volume from pollution generating impervious surfaces while the quantity control regulations require that post-development discharges shall match pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

Existing hard surface	12,797.02 ft^2
New hard surface	280,088.4 ft^2
Replaced hard	12,797.02 ft^2
Native vegetation converted to lawn or landscaping	137,871 ft^2
Native vegetation converted to pasture	0 ft^2
Total land-disturbing activity	9.595 acre
Pollution-generating hard surface	92,000.4 ft^2
Pollution-generating pervious surface	0 ft^2
Total pollution-generating surfaces	92,000.4 ft^2
Total non-pollution-generating surfaces	325,959.4 ft^2

MR #1) Preparation of Stormwater Site Plans
All Stormwater System designs meet City of Camas Requirements for conveyance, quality control and quantity. See final construction documents for more details.

MR #2) Construction Stormwater Pollution Prevention
A Stormwater Pollution Prevention Plan is being included with this report and will be onsite for the duration of the project's construction.

MR #3) Source Control of Pollution
See Section D

MR #4) Preservation of Natural Drainage Systems and Outfalls
Site runoff flows to the SW corner of the site. The proposed development will capture all the existing runoff and release at rates that are in compliance with the SWMMWW. This will maintain and preserve the natural drainage systems.

MR #5) Onsite Stormwater Management
See Section E

MR #6) Runoff Treatment
See Section F

MR #7) Flow Control
See Section G

MR #8) Wetland Protection
Clark County maps show the potential for a Wetland located in the SW corner of the site. Hydroperiod protection modeling will be necessary, See Appendix F and Section H.

MR #9) Operations and Maintenance
See Appendix D

Section C – Soils Evaluation

The soils are mapped by the NRCS as Lauren gravelly loam (LgB) in the South and NE corner of the site, Lauren loam (LeB) along the East border, and McBee silt loam (MIA) along the center and West border if the site. The geotechnical soil investigation found surface soils generally consistent with that soil mapping. The geotechnical report has been included in Appendix C and a soil map is included in Appendix A.

True North Geotechnical, Inc. completed a geotechnical review of the site, dated April 2025. Infiltration testing was performed on the site and was deemed infeasible. Ground water was encountered in test pits 1-5 at depths ranging from 2 feet to 3.5 feet.

Section D – Source Control

The pollution risks involved with this project mainly include the sediment accumulation involved with construction. The Stormwater Pollution Prevention Plan is a document that notes our certain Best Management Practice's (BMP's) that will help prevent sediment laden water from leaving the site during construction. The Erosion Control Plan located in the final construction drawings will provide protection measures involved with minimizing the chance that sediment from the site could enter downstream waterways. After construction is complete, this project does not necessitate any special source control measures due to abnormal risks associated with the project. As this is a single-family home development, appropriate source control responsibilities will fall primarily on popery owner(s). The SWPPP is provided in Appendix E.

Section E – On-site Stormwater Management BMPs

Minimum Requirement 5 requires the applicant to employ On-site Stormwater Management BMPs in accordance with the following project thresholds, standards, and lists to infiltrate, disperse, and retain stormwater runoff on-site to the maximum extent feasible without causing flooding or erosion impacts. Based on section I-3.4.5 of the Stormwater Management Manuel for Western Washington, the development is within the UGA therefore Low Impact Development Performance Standards and BMP T5.13; or List #2 will apply (applicant option).

To meet Minimum Requirement 5, the applicant proposes that the entire site will comply with the LID BMPs from List #2. All requirements that will be applied to this project are noted below and shown in the final construction drawings. If certain BMP's are infeasible; feasibility criteria per the 2024 Stormwater management Manual for Western Washington are also noted.

List #2;
Lawn and Landscape areas:
BMP T5.13 Post-Construction Soil Quality and Depth:
This requirement will be met during final design and shown on final construction drawings.

Roofs:
BMPT5.30A or T5.30B Full Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMPT5.14A or BMPT5.14B Rain Gardens and Bioretention:
The soil permeability factor above groundwater is less than 0.3 inches per hour (measured by the Geotech at less than 0.06 inches per hours). Because the site soils don't accommodate infiltration, this is not a feasible BMP as part of Minimum requirement #5.

BMPT5.10C Downspout Dispersion Systems:
There is insufficient space to meet the required dispersion lengths and setbacks from the structures and the property lines.

BMP T5.10D Perforated Stub-out Connections
There is insufficient space to meet the required setback of 10' away from the structures and property lines, and infiltration rates are less than 0.3 inches per hour.

Other Hard Surfaces:
BMPT5.30A or T5.30B Full Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

BMPT5.15 Permeable Pavement:
Permeable pavement is insufficient due to soil infiltration above the groundwater table being less than 0.3 in/hr.

BMPT5.14A or BMPT5.14B Rain Gardens and Bioretention:
The soil permeability above the groundwater table is less than 0.3 inches per hour. This is not a feasible solution.

BMPT5.12 Sheet Flow Dispersion:
There is insufficient area and length to provide a 100' flow path to meet the requirements of full dispersion while still maintaining sufficient spacing to prevent overlap.

None of the List 2 requirements can be met by the project. Consequently, stormwater on the site will be treated and detained in a detention pond prior to discharge as described in Sections F and G of this report.

The following BMPs will be implemented to meet the minimum requirement 5:

- **BMP T5.13: Post-Construction Soil Quality and Depth** for lawn **and landscaped areas.**
- **BMP D.1: Detention Ponds for runoff from the site.**

Section F – Runoff Treatment Analysis and Design

Treatment for the site will be accomplished via media filter cartridges that will be placed in a vault before entering the detention pond. A small area in the SW of the site will be treated with cartridges places in catch basins as they are too low to enter the vault. The filter system will treat the pollution generating surface runoff that is conveyed to it. Runoff from the building roofs and other non-pollution generating areas will be piped to bypass the filter cartridges when possible. The cartridge units will be sized to treat all the runoff that is routed to them.

For this preliminary phase it is assumed that all of the site will be treated. The Treatment Analysis WWHM model contained in Appendix B identifies an off-line WQ flow of 0.5010 CFS. Per Table 1 below, LowDrop PhosphoSorb are designed to treat 0.019 CFS each. So, the most LowDrop PhosphoSorb cartridges that would be used for this project will be 27, all contained in a vault and the south end of the site. A small portion of the site will be treated with the same PhosphoSorb LowDrop in manholes along the southwest end of the site. The final design will evaluate sub basin flows to the vault and manholes and identify where each of the cartridges are located.

Table 1-Contech Sizing Chart

	Perlite 2 GPM/ft²			ZPG 1 GPM/ft²			PhosphoSorb 1.67 GPM/ft²		
StormFilter	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color	Flow (GPM)	Flow (CFS)	Color
LowDrop	10	0.022	Gray (GRY)	5.00	0.011	Blue (BLU)	8.35	0.019	Yellow (YLW)
18"	15	0.033	Black (BLK)	7.50	0.017	Blue (BLU)	12.53	0.028	Red (RED)
27"	22.5	0.05	Gold (GLD)	11.50	0.025	Pink (PNK)	18.79	0.042	White (WHT)

Section G - Flow Control Analysis and Design

The stormwater quantity control system for this site has been designed based on the current stormwater quantity control requirements of the City of Camas. The quantity control standards require that stormwater discharges shall match developed discharge durations to pre-developed durations for the

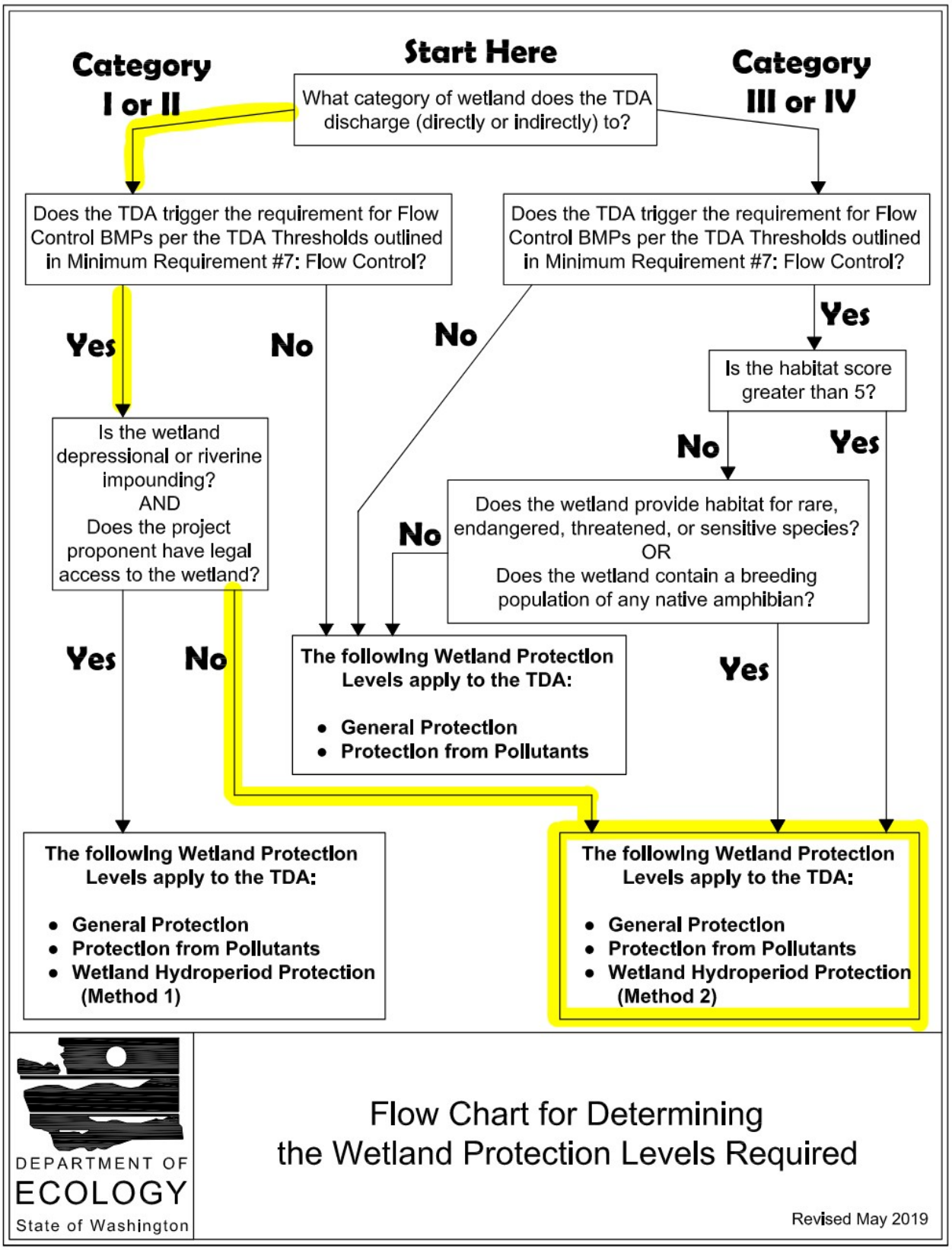
range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow.

The detention pond mentioned in section F was modelled in WWHM and successfully store and releases al of the stormwater runoff from the site without using infiltration. Modeling basins were calculated as a developed site using Soil Group 3 as the underlying soils per the geotechnical recommendation contained in Appendix C. Calculations and values can be seen in Appendix B.

The detention pond design for Basin one has a bottom area of 4,607 square feet, equivalent square footage was used for WWHM calculations. The basin has an effective depth of 5', with 3:1 slopes on all sides. It has a riser height of 4', diameter 18", notch height of 1.25', width of 1', and an orifice diameter of 4.5'. The WWHM design model in Appendix B shows that this detention pond exceeds the requirements and can be reduced in size. This preliminary TIR is showing that stormwater for the site can meet the requirements of SWMMWW. The sizes of this facility will be fine-tuned in the final design.

Infiltration does not work if the groundwater is too shallow. Consequently, groundwater depth is a significant issue for this project. The geotechnical investigation discovered ground water in all exploration except TP-6.

Section H – Wetland Protection



2024 SWMMWW I-C.2 General Wetland Protection

All wetlands (Categories I, II, III, and IV) must receive the following general protection:

1. Consult regulations issued under federal and state laws that regulate the discharge of pollutants to surface waters, including the Construction Stormwater General NPDES Permit.

   The site stormwater system has been appropriately designed and complies with federal and state laws and discharging to the wetland in the proposed manner is allowed. Refer to section B of this report for compliance with Minimum Requirements 1-9. An NPDES permit will be applied for and obtained during final engineering design.

2. Maintain the wetland buffer required by city and/or state and federal regulations

   The critical Areas Report produced by Ash Eco Solutions identified a standard buffer of 260'. The wetland buffer is located on the edge of the southwest border. No direct impact with the wetland buffer will occur.

3. Retain areas of native vegetation connecting the wetland and its buffer with nearby wetlands and other contiguous areas of native vegetation.

   The Critical Areas Report shows three wetlands next to the site. Two are directly East and neither the wetlands or the buffers touch the site and are unaffected from site development. To the Southwest is where the wetland being modeled is located. Vegetation surrounding the wetlands, and its buffer, will be avoided to the maximum extent possible.

4. Avoid compaction of soil and introduction of invasive plant or animal species in the wetland and its buffer.

   The entire wetland exists off site and will not be constructed on. Compaction and introduction of invasive species within the buffer will be avoided to the maximum extent feasible.

5. Take measures to avoid general physical impacts (e.g., littering and vegetation destruction). Examples are protecting existing buffer zones; discouraging access, especially by vehicles, by planting outside the wetland, and encouragement of stewardship and signage by landowners.

   The wetland is located offsite and physical impacts to the buffer will be avoided to the maximum extent feasible. Silt fencing will be installed along the project grading limits to discourage access to the wetland. Disturbances to the buffer have been accounted for in the critical areas report.

6. Any stormwater management practices, such as Runoff Treatment or Flow Control BMP implementation, must be done outside of the wetland buffer boundary, except limited circumstances where the wetland and/or buffer any be used for additional Runoff Treatment and/or Flow Control of stormwater (See 1-C.6 Compensatory Mitigation of Wetlands)

No stormwater management or flow control BMPs are implemented inside of a wetland buffer.

7. Discharge from a BMP or project site should be dispersed using a method to diffuse the flow before entering the wetland buffer.

   Upon exiting the detention pond, a flow spreader is used at the outflow point to partially diffuse the flow. Due to elevation constraints and site limitation, it is not possible to diffuse runoff prior to entering the wetland buffer.

8. Consider fences to restrict human access, but make sure it doesn't interfere with wildlife movement. They should be used when wildlife passage is not a major issue and the potential for intrusive impacts is high. When wildlife movement and intrusion are both issues, the circumstance will have to weighed to make a decision about fencing. Check with the local and/or state agencies to determine if fencing would be allowed.

   The entire wetland is located offsite with only a small section of the buffer onsite. Fencing is not being proposed around the wetland or buffer. Intrusive impacts to the wetland are not expected.

2024 SWMMWW I-C.3 Wetland Protection from Pollutants

All wetlands (Categories, I, II, III and IV) must receive the following protection from pollutants:

1. Provide Construction Stormwater BMPs as directed in I-3.4.2 MR2: Construction Stormwater Pollution Prevention Plan (SWPPP) to prevent sediment and other pollutants from entering the wetland.

   A Construction Stormwater BMPs as directed in Book 1, Section 1.5.2 MR #2 Construction Stormwater Pollution Prevention Plan (SWPPP) to prevent sediment and other pollutants from entering the wetland.

2. Provide Source Control BMPs as directed in I-3.5.3 MR3: Source Control of Pollution. Refer to Volume IV and local jurisdiction requirements.

   Refer to Minimum Requirement #3 in Section B of this report for the proposed Source Control BMPs.

3. Provide On-Site Stormwater Management and use LID principles as much as practicable for the site, as directed in I-3.5.4 MR5: On-Site Stormwater Management. LID principles and practices will help meet other wetland hydroperiod protection criteria and provide additional habitat.

   Refer to Minimum Requirement #5 and Section E of this report for the proposed stormwater management BMPs. LID principles were incorporated into the design to the extent feasible.

4. Provide Runoff Treatment for I-3.4.6 MR6: Runoff Treatment to treat runoff prior to entering the wetland and its buffer.

   The storm water will be treated in a vault prior to entering any wetland or its buffer.

2024 SWMMWW I-C.4 Wetland Hydroperiod Protection

The intent of the Wetland Hydroperiod Protection is to maintain the wetland's annual fluctuations in water depth and it's timing as closely as possible (Methods 1 and 2) that are dependent on the wetland category and whether the project has legal access to the wetland.

According to Figure 1.4 (Minimum Requirement #8 Flow Chart) of the 2024 Stormwater Management Manual for Western Washington, Method 2 shall be used for this project.

Criteria for Method 2:

The project proponent must ensure both of the following criteria are met to comply with method 2 of the Wetland Hydroperiod Protection.

> Criteria 1: Mean Daily Total Discharge Volumes from the Site. The total volume of water into the wetland on a daily basis should not be more than 20% higher or lower than the pre-project volumes.
>
> Criteria 2: Mean Monthly Total Discharge Volumes from the Site. The total volume flow of water into the wetland on a monthly basis should not be more than 15% higher or lower than the pro-project volumes.

The Western Washing hydrology model (WWHM) was used to complete the Method 2 modeling.

There are three wetlands associated with this site. Two are category III wetland located fully offsite to the west and will not be affected by the development of this site. The last wetland is a category II wetland located southeast of site with a habitat score of 8. Development will impact the discharge area and discharge volumes to the existing wetland. Wetland hydroperiod protection method 2 will be applied as it is a category 2 wetland.

Off-site Wetland A Category II Method 2 Hydroperiod Protection Analysis:

Per I-C.5 Wetland Hydroperiod Protection; Method 2

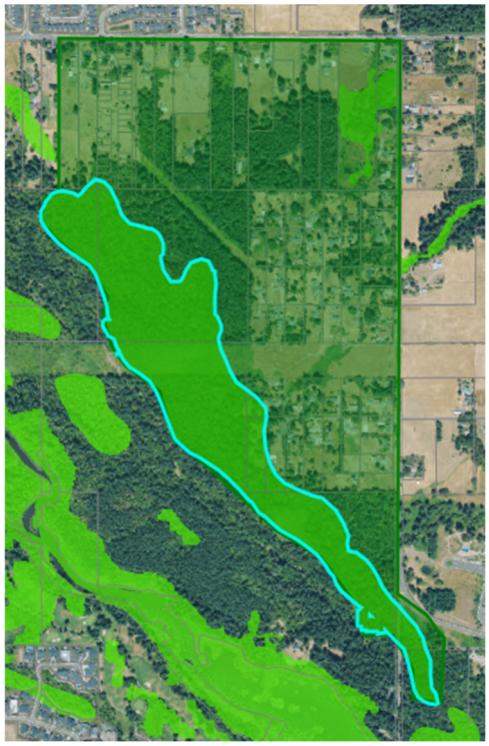
Pre-Project Scenario:

Step 1: Identify existing impervious and pervious surfaces that discharge to the wetland and use the model elements to represent these land areas.

Due to the large contributing basin of the on-site Category II wetland the Clark County GIS software was used to evaluate the existing contours and existing drainage infrastructure to assess the approximate contributing discharge basin that provides hydrology to the wetland both on and off-site. The approximate total area that contributed to the wetland was determined to be 11,106,680 square feet (254.974). The contributing area is shown below.

Area Information	
Sq. Feet:	11,347,443.66
Sq. Yards:	1,260,827.07
Sq. Miles:	0.41
Acres:	260.50
Sq. Meters:	1,054,212.01
Sq. Kilometers:	1.05
Hectares:	105.42

Perimeter Information	
Feet:	16,457.85
Yards:	5,485.95
Miles:	3.12
Meters:	5,016.35
Kilometers:	5.02



After the basin boundary was determined the existing pervious and impervious areas offsite were determined with the use of google arial images, Clark County GIS, and scaled maps with Bluebeam software. The on and off-site pervious and impervious areas are detailed below.

Onsite Pre-Project Areas

Basin	Surface Cover	Area (AC)
1	Forest	8.4083
2	Forest	1.1867

t

Off-site Pre-Project Area

Surface Cover	Area (AC)
Roof	8.983
Road	4.561
Driveway	4.685
Forest	117.672
Fields	119.073
Total	254.974

To represent the pervious and impervious land area in WWHM, lateral flow basin elements were used. For all lawn, field and forested land areas pervious later basins were used. For all roads, roofs and driveways impervious later basin elements were used.

Step 2: Identify the wetland buffer area and use the lateral flow soil basin to represent the wetland buffer.

To determine the area of the wetland buffer, a 260' moderate LUI buffer was measured using Bluebeam, the area was modeled in WWHM with the later flow soil basin.

The Wetland Buffer area was determined to be 136.745 acres.

The determined 260' moderate LUI buffer expands onto the project site. Of the 9.595 acres of onsite area, only 1.416 acres were determined as part of the wetland buffer.

Step 3: Connect the model elements to the wetland buffer ensuring that impervious land areas are connected to surface flows and that for any other model elements all flows are connected.

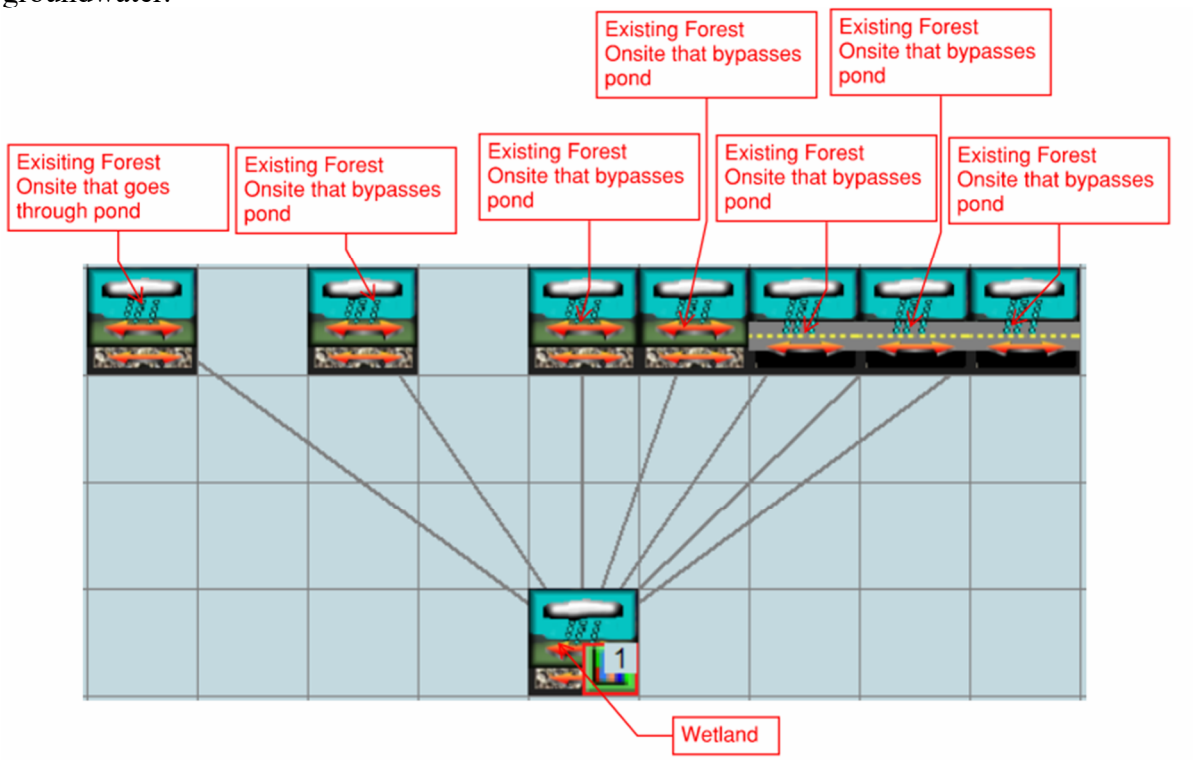
The land use areas determined in steps one and two were associated to the proper lateral basins. The onsite lateral basin and all off-site lateral basins elements were individually connected to the lateral basin representing the wetland buffer.

Step 4: Set the wetland buffer element as the most downstream element:

The later basin representing the wetland buffer is set as the downstream basin, where all other basins are connected to discharge to the wetland basin.

Step 5: Set the POC at the outflow of the wetland buffer element including surface runoff, interflow and groundwater.

Ex Wetland lateral basin element attached to POC 1 including surface runoff, interflow and groundwater.



Post-project Simulation:

Step 1: Identify anticipated post-project impervious and pervious surfaces that discharge to the wetland and use the model elements to represent these land areas.

Of the 9.595 acres of on site, predeveloped land cover, both in and outside of the buffer range, all 9.595 acres will be routed through the wetland buffer. All off-site areas will remain the same post-Project.

Onsite Post-Project Area

Basin	Surface Cover	Area (AC)
1	Lawn	2.6095
1	Road	1.2737
1	Roof	3.8738
1	Driveway	0.2663
1	Sidewalk	0.3849

Onsite Post-Project Area Bypass Pond

Basin	Surface Cover	Area (AC)
2	Lawn	0.5556
2	Road	0.1108
2	Roof	0.4441
2	Driveway	0.0367
2	Sidewalk	0.0396

On-Site Post-Project Area

Surface Cover	Area (AC)
Roof	8.983
Road	4.561
Driveway	4.685
Forest	117.672
Fields	119.073
Total	254.974

Step 2: Identify any Flow Control BMPs and use the appropriate model elements to represent these facilities

The majority of the flow exiting the site will be discharged form a detention pond with a small amount bypassing the pond and leaving through the same flow spreader.

Step 3: Identify the wetland buffer area and use the lateral flow soil basin to represent the wetland buffer.

The wetland buffer area will stay the same 260' LUI buffer.

Step 4: Connect the model elements to the wetland buffer ensuring that impervious land areas are connected to surface flows and that for any other model elements all flows are connected.

Post-project lateral basins are connected to the wetland elements. All basins used are pervious lateral flow basins connected via surface flow, interflow and groundwater.

Step 5: Connect any flow control BMPS elements to the wetland buffer ensuring that surface flows are connected to surface water and any infiltration is connected to ground water.

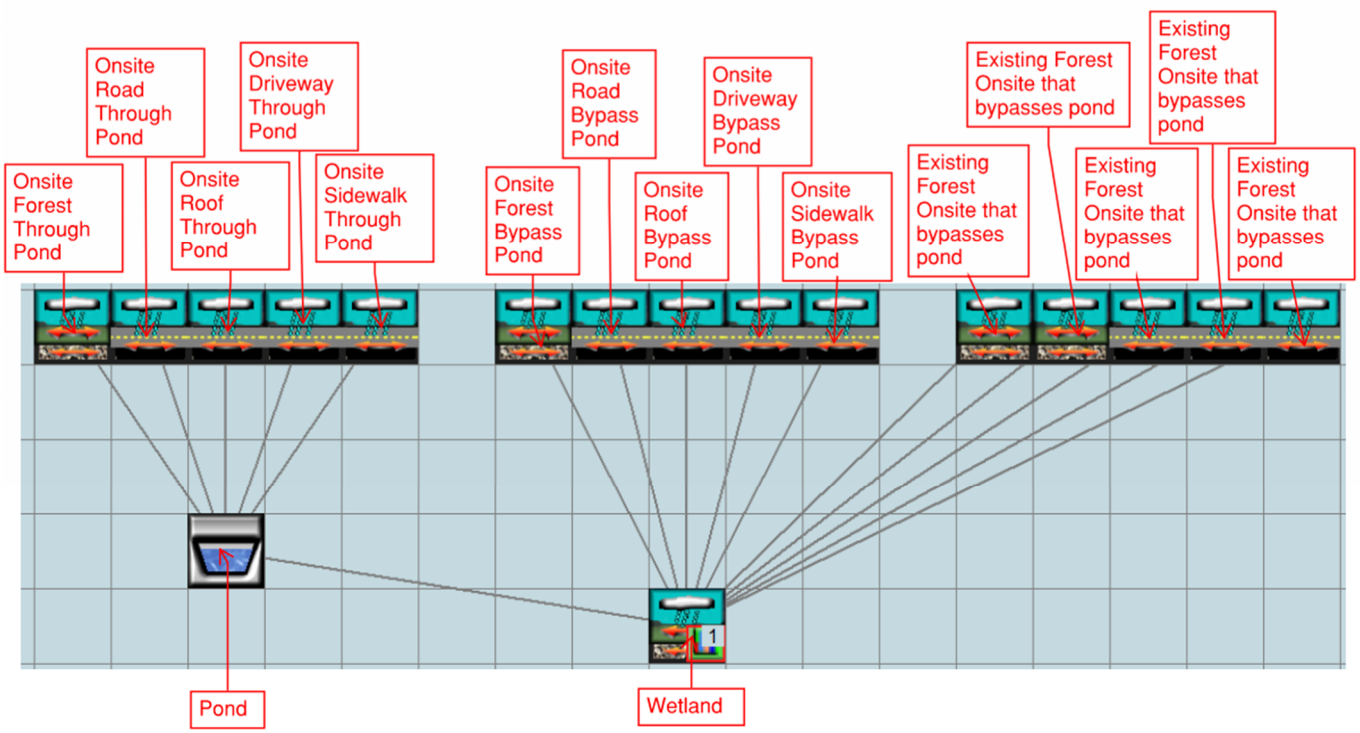
The detention pond is connected to the onsite lateral basins and connected to the wetland out of outlet one and into surface flow.

Step 6: Set the wetland buffer element to the most downstream element.

All lateral basins are set to connect to the wetland element.

Step 7: Set the POC at the outflow of the wetland buffer element including surface runoff, interflow and groundwater.

POC 1 is connected to the wetland element set to be the outflow including surface runoff, interflow, and groundwater.



Both scenarios were run, and then POC 1 was analyzed via the Wetland Input Volumes analysis. The model passed all 365 days of criteria 1 and passed all 12 months of criteria 2.

WWHM Reports can be found in Appendix B.

The model was run and the results were analyzed. The system passed all 365 days of Criterion 1 and passed all 12 months of Criterion 2. The full WWHM report is attached.

Section I – Other Permits

The project will be required to obtain Final Decision issued by Hearing Examiner, civil engineering plan approval, and NPDES construction stormwater permit.

Section J – Conveyance Systems Analysis and Design

Preliminary calculations were done in HydroCAD and a 12" storm pipe for the bypass section and a 15" storm pipe for the rest of the site will be able to convey all water.

Section K – Special Reports and Studies

A Geotechnical Report for the site was prepared by True North, Inc. and is included in Appendix C. A Critical Areas report is included in Appendix F. No other special studies are anticipated to be needed.

Section L –Operations and Maintenance Manual

The stormwater facility located on-site will be maintained by the site owner. An Operations and Maintenance Manual is included as Appendix D of this report.

APPENDIX A

Maps

The Landing at Green Mountain 2



6/30/2025

1:4,523

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.17 km

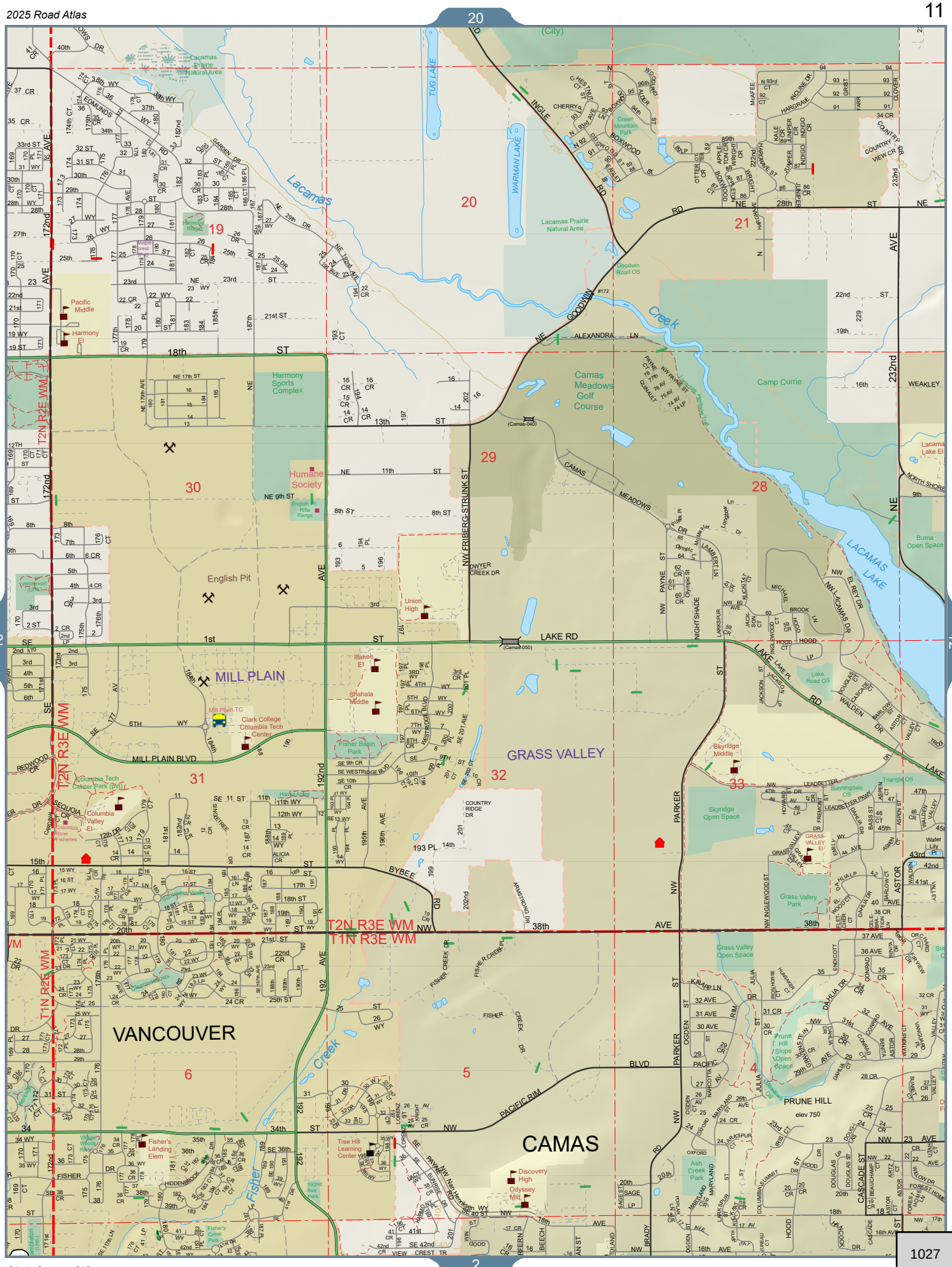
Taxlots Public

Critical Aquifer Recharge Area

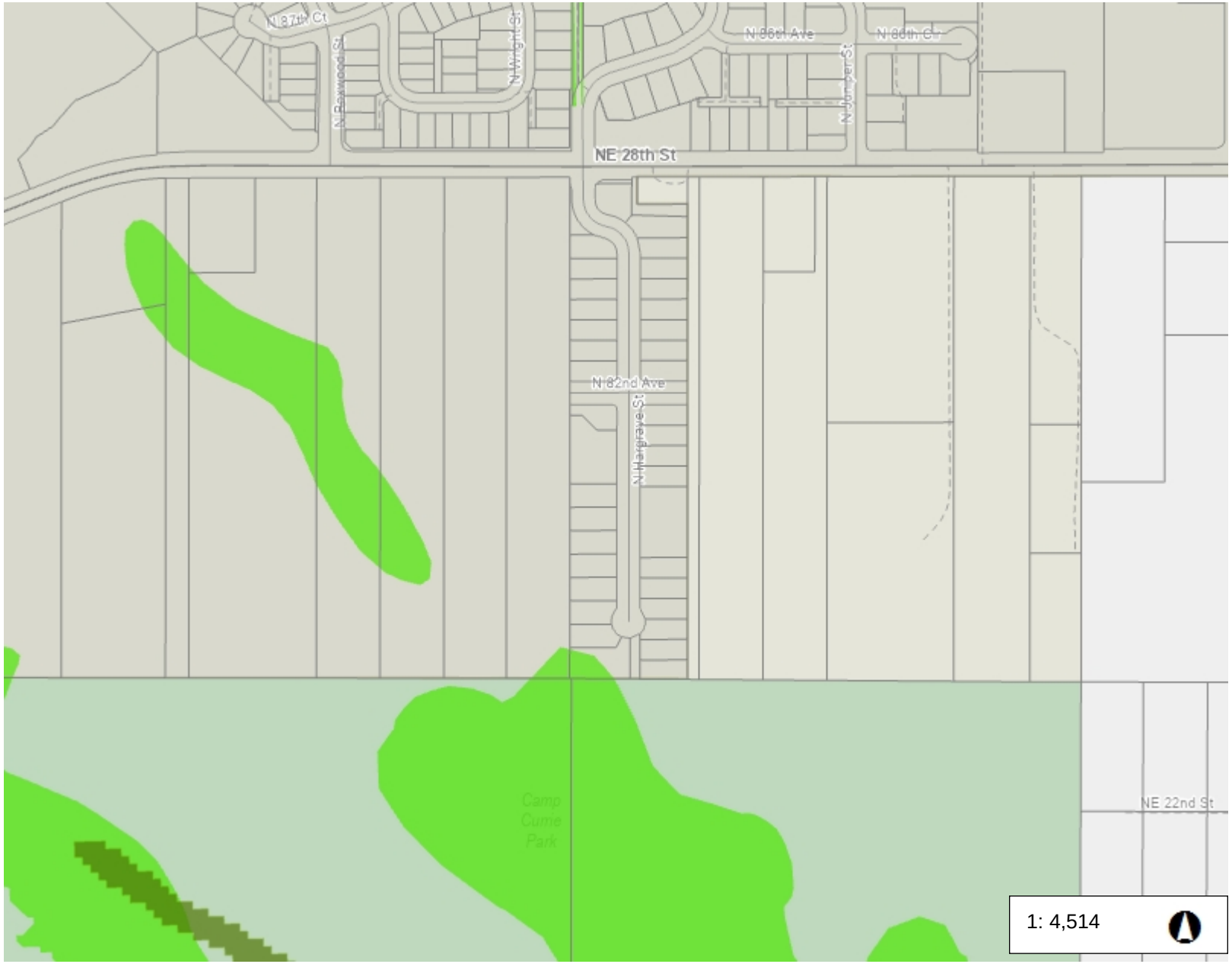
Category 2 Recharge Areas

Light_Gray_Canvas_Base

County of Clark, Oregon Metro, Bureau of Land Management, State of Oregon, State of Oregon DOT, State of Oregon GEO, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA, Clark County WA


20
10
12
2
VANCOUVER
CAMAS
GRASS VALLEY
MILL PLAIN
PRUNE HILL
elev 750
T2N R2E WM
T2N R3E WM
T1N R2E WM
T1N R3E WM
Lacamas Creek
Fisher Creek
TUG LAKE
WARMAN LAKE
LACAMAS LAKE
Camas Meadows Golf Course
Camp Currie
Harmony Sports Complex
Humane Society
English Pit
Lacamas Prairie Natural Area
Green Mountain Park
Goodwin Road OS
Buma Open Space
Lake Road OS
Skyridge Open Space
Grass Valley Park
Grass Valley Open Space
Prune Hill Slope Open Space
Ash Creek Park
Fisher Basin Park
Columbia Tech Center Park (PVT)
Fisher's Landing Elem
Union High
Skyridge Middle
Shahala Middle
Discovery High
Odyssey Mid
Pacific Middle
Harmony El
Illahee El
Clark College Columbia Tech Center
Mill Plain TC
Columbia Valley El
Lacamas Lake El
Tree Hill Learning Center
Sunningdale OS
Triangle OS
Water Lily Pl
Trail
Lacamas Heritage Trail
NW FRIBERG-STRUNK ST
LAKE RD
MILL PLAIN BLVD
BYBEE RD
PACIFIC RIM BLVD
NW PARKER ST
NW 38th AVE
NW 232nd ST
NE 28th ST
NE 18th ST
NE 13th ST
NE 8th ST
NE 1st ST
SE 1st ST
SE 192nd AVE
NW 172nd AVE
NW 23rd AVE
NW 9th AVE
NW LACAMAS DR
NW EL REY DR
NW NIGHTSHADE
NW GOODWIN
NW ALEXANDRA LN
NW CAMAS MEADOWS
NW PAYNE ST
NW LAKE RD
NW 6th AVE
NW 15th AVE
NW 16th AVE
NW 20th AVE
NW 21st AVE
NW 24th AVE
NW 25th AVE
NW 26th AVE
NW 27th AVE
NW 29th AVE
NW 30th AVE
NW 31 AVE
NW 32 AVE
NW 36 AVE
NW 37 AVE
NW 38th AVE
NW 42nd AVE
NW 43rd AVE
NW 45th AVE
NW 47th AVE
NW 232nd ST
NW 229th ST
NW 222nd ST
NW 202nd ST
NW 201st AVE
NW 200th AVE
NW 198th AVE
NW 196th AVE
NW 195th AVE
NW 192nd AVE
NW 191st AVE
NW 187th AVE
NW 186th AVE
NW 184th AVE
NW 183rd AVE
NW 181st AVE
NW 179th AVE
NW 178th AVE
NW 176th AVE
NW 175th AVE
NW 173rd AVE
NW 172nd AVE
NW 170th AVE
NW 169th AVE
NW 167th AVE
NW 166th AVE
NW 165th AVE
NW 164th AVE
NW 163rd AVE
NW 162nd AVE
NW 161st AVE
NW 160th AVE
NW 159th AVE
NW 158th AVE
NW 157th AVE
NW 156th AVE
NW 155th AVE
NW 154th AVE
NW 153rd AVE
NW 152nd AVE
NW 151st AVE
NW 150th AVE
NW 149th AVE
NW 148th AVE
NW 147th AVE
NW 146th AVE
NW 145th AVE
NW 144th AVE
NW 143rd AVE
NW 142nd AVE
NW 141st AVE
NW 140th AVE
NW 139th AVE
NW 138th AVE
NW 137th AVE
NW 136th AVE
NW 135th AVE
NW 134th AVE
NW 133rd AVE
NW 132nd AVE
NW 131st AVE
NW 130th AVE
NW 129th AVE
NW 128th AVE
NW 127th AVE
NW 126th AVE
NW 125th AVE
NW 124th AVE
NW 123rd AVE
NW 122nd AVE
NW 121st AVE
NW 120th AVE
NW 119th AVE
NW 118th AVE
NW 117th AVE
NW 116th AVE
NW 115th AVE
NW 114th AVE
NW 113th AVE
NW 112th AVE
NW 111th AVE
NW 110th AVE
NW 109th AVE
NW 108th AVE
NW 107th AVE
NW 106th AVE
NW 105th AVE
NW 104th AVE
NW 103rd AVE
NW 102nd AVE
NW 101st AVE
NW 100th AVE
NW 99th AVE
NW 98th AVE
NW 97th AVE
NW 96th AVE
NW 95th AVE
NW 94th AVE
NW 93rd AVE
NW 92nd AVE
NW 91st AVE
NW 90th AVE
NW 89th AVE
NW 88th AVE
NW 87th AVE
NW 86th AVE
NW 85th AVE
NW 84th AVE
NW 83rd AVE
NW 82nd AVE
NW 81st AVE
NW 80th AVE
NW 79th AVE
NW 78th AVE
NW 77th AVE
NW 76th AVE
NW 75th AVE
NW 74th AVE
NW 73rd AVE
NW 72nd AVE
NW 71st AVE
NW 70th AVE
NW 69th AVE
NW 68th AVE
NW 67th AVE
NW 66th AVE
NW 65th AVE
NW 64th AVE
NW 63rd AVE
NW 62nd AVE
NW 61st AVE
NW 60th AVE
NW 59th AVE
NW 58th AVE
NW 57th AVE
NW 56th AVE
NW 55th AVE
NW 54th AVE
NW 53rd AVE
NW 52nd AVE
NW 51st AVE
NW 50th AVE
NW 49th AVE
NW 48th AVE
NW 47th AVE
NW 46th AVE
NW 45th AVE
NW 44th AVE
NW 43rd AVE
NW 42nd AVE
NW 41st AVE
NW 40th AVE
NW 39th AVE
NW 38th AVE
NW 37th AVE
NW 36th AVE
NW 35th AVE
NW 34th AVE
NW 33rd AVE
NW 32nd AVE
NW 31st AVE
NW 30th AVE
NW 29th AVE
NW 28th AVE
NW 27th AVE
NW 26th AVE
NW 25th AVE
NW 24th AVE
NW 23rd AVE
NW 22nd AVE
NW 21st AVE
NW 20th AVE
NW 19th AVE
NW 18th AVE
NW 17th AVE
NW 16th AVE
NW 15th AVE
NW 14th AVE
NW 13th AVE
NW 12th AVE
NW 11th AVE
NW 10th AVE
NW 9th AVE
NW 8th AVE
NW 7th AVE
NW 6th AVE
NW 5th AVE
NW 4th AVE
NW 3rd AVE
NW 2nd AVE
NW 1st AVE

Landing at Green Mountain 2





Legend

- Taxlots
- Severe Erosion Hazard Areas
- Steep Slopes and Landslide H
  - Areas of Historic or Active Landslid
  - Areas of Potential Instability
  - Areas of Older Landslide Debris
  - Slopes > 15%
  - Slopes > 25%
- Potential Wetlands Presence

Notes:

1: 4,514

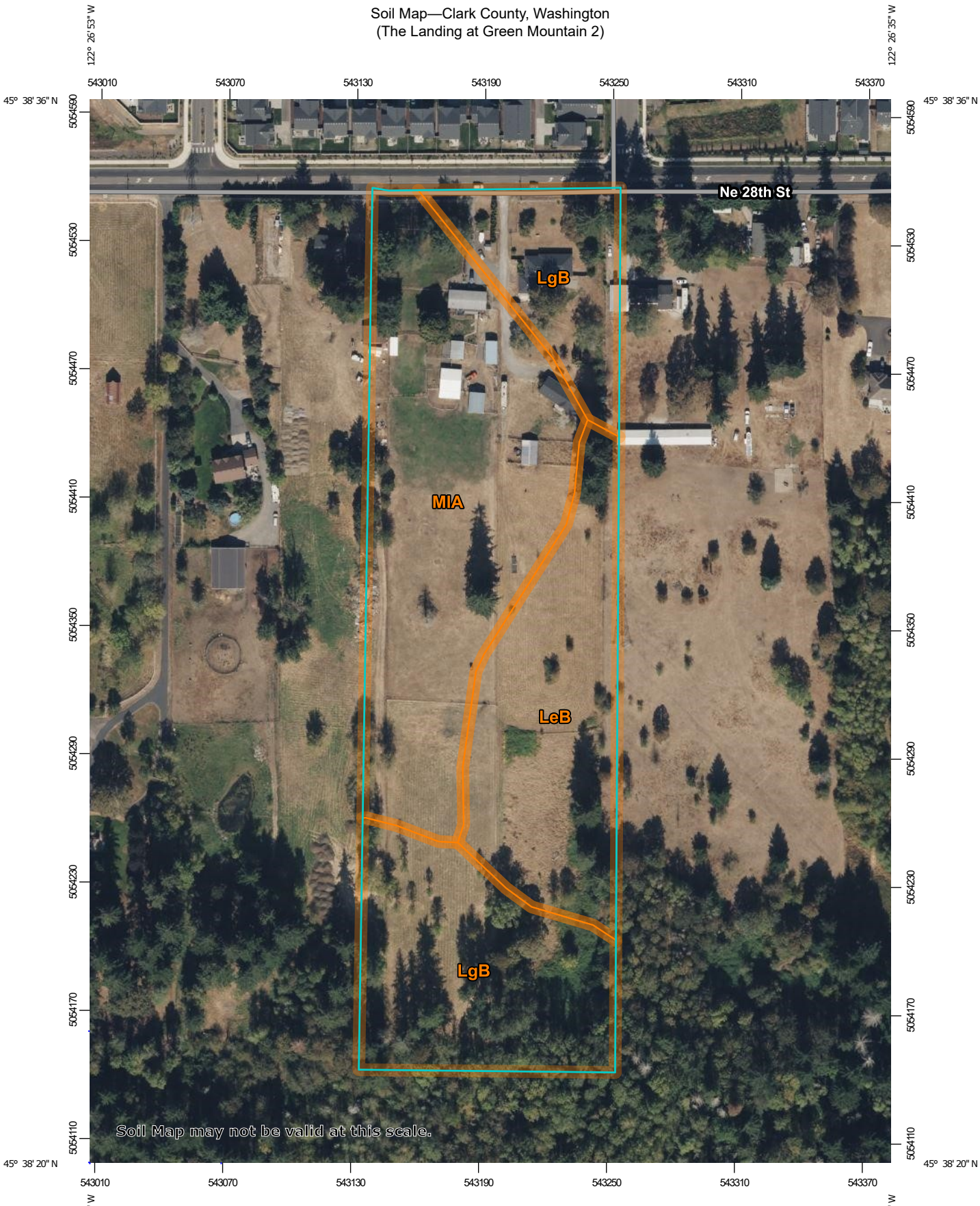
752.3 0 376.17 752.3 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Taxlot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.

1028

Soil Map—Clark County, Washington
(The Landing at Green Mountain 2)



Map Scale: 1:2,420 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County, Washington
Survey Area Data: Version 22, Aug 26, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 26, 2022—Oct 11, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
LeB	Lauren loam, 0 to 8 percent slopes	2.9	24.0%
LgB	Lauren gravelly loam, 0 to 8 percent slopes	4.2	34.4%
MlA	McBee silt loam, coarse variant, 0 to 3 percent slopes	5.0	41.6%
Totals for Area of Interest		**12.1**	**100.0%**

APPENDIX B

Design Calculations and Modeling

WWHM2012

PROJECT REPORT

General Model Information

WWHM2012 Project Name: Hyroperiod Protection Final
Site Name:
Site Address:
City:
Report Date: 6/27/2025
Gage: Lacamas
Data Start: 1948/10/01
Data End: 2008/09/30
Timestep: 15 Minute
Precip Scale: 1.300
Version Date: 2023/01/27
Version: 4.2.19

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Predeveloped Forest Onsite

Bypass: No

GroundWater: No

Pervious Land Use	acre
SG4, Forest, Mod	8.4083

Predeveloped Field Onsite

Bypass: No

GroundWater: No

Pervious Land Use	acre
SG4, Forest, Mod	1.1867

Predeveloped Roads Offsite

Bypass:	No
Impervious Land Use	acre
ROADS FLAT	3.973

Predeveloped Roofs Offsite

Bypass:	No
Impervious Land Use	acre
ROOF TOPS FLAT	8.983

Predeveloped Driveway Offsite

Bypass:	No
Impervious Land Use	acre
DRIVEWAYS FLAT	4.685

Predeveloped Field Offsite

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Field, Mod	102.329

Predeveloped Forest Offsite

Bypass: No

GroundWater: No

Pervious Land Use	acre
SG4, Forest, Mod	117.672

Wetland

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Forest, Mod	136.745

Mitigated Land Use

Mitigated Lawn Onsite

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Mod	2.6095

Mitigated Road Onsite Bypass

Bypass:	No
Impervious Land Use	acre
ROADS FLAT	0.1108

Mitigated Roof Onsite Bypass

Bypass:	No
Impervious Land Use	acre
ROOF TOPS FLAT	0.4441

Mitigated Driveway Onsite Bypass

Bypass:	No
Impervious Land Use	acre
DRIVEWAYS FLAT	0.0367

Mitigated Sidewalk Onsite Bypass

Bypass:	No
Impervious Land Use	acre
SIDEWALKS FLAT	0.0396

Mitigated Lawn Onsite Bypass

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Mod	.5556

Mitigated Road Onsite

Bypass:	No
Impervious Land Use	acre
ROADS FLAT	1.2737

Mitigated Roof Onsite

Bypass:	No
Impervious Land Use	acre
ROOF TOPS FLAT	3.8738

Mitigated Driveway Onsite

Bypass:	No
Impervious Land Use	acre
DRIVEWAYS FLAT	0.2663

Mitigated Sidewalk Onsite

Bypass:	No
Impervious Land Use	acre
SIDEWALKS FLAT	0.3849

Wetland

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Forest, Mod	136.745

Mitigated Forest Offsite

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Forest, Mod	117.672

Mitigated Field Offsite

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Field, Mod	102.329

Mitigated Roads Offsite

Bypass:	No
Impervious Land Use	acre
ROADS FLAT	3.973

Mitigated Roofs Offsite

Bypass:	No
Impervious Land Use	acre
ROOF TOPS FLAT	8.983

Mitigated Driveway Offsite

Bypass:	No
Impervious Land Use	acre
DRIVEWAYS FLAT	4.685

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length: 100.00 ft.
Bottom Width: 46.00 ft.
Depth: 5 ft.
Volume at riser head: 0.6120 acre-feet.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 3 To 1
Side slope 4: 3 To 1
Discharge Structure
Riser Height: 4 ft.
Riser Diameter: 18 in.
Notch Type: Rectangular
Notch Width: 0.250 ft.
Notch Height: 1.250 ft.
Orifice 1 Diameter: 4.500 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2
Wetland

Pond Hydraulic Table

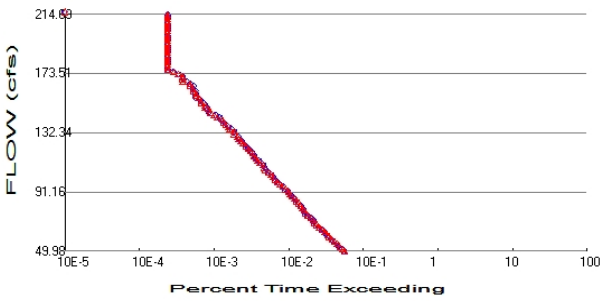
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.105	0.000	0.000	0.000
0.0556	0.106	0.005	0.129	0.000
0.1111	0.107	0.011	0.183	0.000
0.1667	0.109	0.017	0.224	0.000
0.2222	0.110	0.024	0.259	0.000
0.2778	0.111	0.030	0.289	0.000
0.3333	0.112	0.036	0.317	0.000
0.3889	0.113	0.042	0.342	0.000
0.4444	0.114	0.048	0.366	0.000
0.5000	0.115	0.055	0.388	0.000
0.5556	0.117	0.061	0.409	0.000
0.6111	0.118	0.068	0.429	0.000
0.6667	0.119	0.075	0.448	0.000
0.7222	0.120	0.081	0.467	0.000
0.7778	0.121	0.088	0.484	0.000
0.8333	0.122	0.095	0.501	0.000
0.8889	0.124	0.102	0.518	0.000
0.9444	0.125	0.108	0.534	0.000
1.0000	0.126	0.115	0.549	0.000
1.0556	0.127	0.123	0.564	0.000
1.1111	0.129	0.130	0.579	0.000
1.1667	0.130	0.137	0.593	0.000
1.2222	0.131	0.144	0.607	0.000
1.2778	0.132	0.151	0.621	0.000
1.3333	0.133	0.159	0.634	0.000
1.3889	0.135	0.166	0.647	0.000
1.4444	0.136	0.174	0.660	0.000
1.5000	0.137	0.182	0.673	0.000
1.5556	0.138	0.189	0.685	0.000
1.6111	0.140	0.197	0.697	0.000
1.6667	0.141	0.205	0.709	0.000
1.7222	0.142	0.213	0.721	0.000

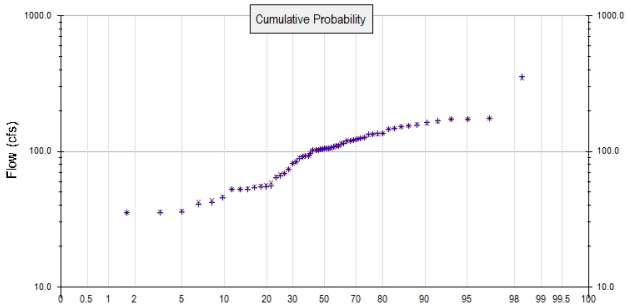
1.7778	0.144	0.221	0.732	0.000
1.8333	0.145	0.229	0.744	0.000
1.8889	0.146	0.237	0.755	0.000
1.9444	0.147	0.245	0.766	0.000
2.0000	0.149	0.253	0.777	0.000
2.0556	0.150	0.261	0.787	0.000
2.1111	0.151	0.270	0.798	0.000
2.1667	0.153	0.278	0.808	0.000
2.2222	0.154	0.287	0.819	0.000
2.2778	0.155	0.296	0.829	0.000
2.3333	0.157	0.304	0.839	0.000
2.3889	0.158	0.313	0.849	0.000
2.4444	0.159	0.322	0.859	0.000
2.5000	0.161	0.331	0.868	0.000
2.5556	0.162	0.340	0.878	0.000
2.6111	0.163	0.349	0.888	0.000
2.6667	0.165	0.358	0.897	0.000
2.7222	0.166	0.367	0.906	0.000
2.7778	0.167	0.376	0.919	0.000
2.8333	0.169	0.386	0.944	0.000
2.8889	0.170	0.395	0.975	0.000
2.9444	0.172	0.405	1.011	0.000
3.0000	0.173	0.414	1.050	0.000
3.0556	0.174	0.424	1.092	0.000
3.1111	0.176	0.434	1.136	0.000
3.1667	0.177	0.444	1.183	0.000
3.2222	0.179	0.453	1.231	0.000
3.2778	0.180	0.463	1.280	0.000
3.3333	0.181	0.473	1.330	0.000
3.3889	0.183	0.484	1.382	0.000
3.4444	0.184	0.494	1.434	0.000
3.5000	0.186	0.504	1.487	0.000
3.5556	0.187	0.515	1.541	0.000
3.6111	0.189	0.525	1.594	0.000
3.6667	0.190	0.536	1.648	0.000
3.7222	0.191	0.546	1.703	0.000
3.7778	0.193	0.557	1.762	0.000
3.8333	0.194	0.568	1.826	0.000
3.8889	0.196	0.578	1.893	0.000
3.9444	0.197	0.589	1.960	0.000
4.0000	0.199	0.600	2.029	0.000
4.0556	0.200	0.612	2.245	0.000
4.1111	0.202	0.623	2.632	0.000
4.1667	0.203	0.634	3.126	0.000
4.2222	0.205	0.645	3.696	0.000
4.2778	0.206	0.657	4.316	0.000
4.3333	0.208	0.668	4.957	0.000
4.3889	0.209	0.680	5.591	0.000
4.4444	0.211	0.692	6.192	0.000
4.5000	0.212	0.703	6.735	0.000
4.5556	0.214	0.715	7.201	0.000
4.6111	0.215	0.727	7.579	0.000
4.6667	0.217	0.739	7.872	0.000
4.7222	0.219	0.751	8.099	0.000
4.7778	0.220	0.764	8.381	0.000
4.8333	0.222	0.776	8.608	0.000
4.8889	0.223	0.788	8.827	0.000
4.9444	0.225	0.801	9.039	0.000

5.0000	0.226	0.813	9.246	0.000
5.0556	0.228	0.826	9.447	0.000

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 366.341
Total Impervious Area: 17.641

Mitigated Landuse Totals for POC #1
Total Pervious Area: 359.9111
Total Impervious Area: 24.0709

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	99.968257
5 year	148.509224
10 year	174.079819
25 year	199.662705
50 year	214.685902
100 year	226.947761

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	100.417804
5 year	146.702267
10 year	170.810932
25 year	194.781315
50 year	208.796013
100 year	220.203905

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	73.793	73.973
1950	96.285	96.009
1951	133.163	131.478
1952	90.692	92.482
1953	110.173	110.073
1954	145.010	144.934
1955	83.578	83.404
1956	154.855	155.326
1957	123.759	123.609
1958	113.514	115.535

1959	52.328	52.576
1960	54.685	55.083
1961	135.301	134.284
1962	110.540	110.278
1963	114.123	113.893
1964	102.298	101.692
1965	102.336	102.156
1966	120.966	120.372
1967	104.394	105.468
1968	124.718	124.181
1969	101.761	101.989
1970	353.736	347.942
1971	63.950	64.770
1972	92.127	91.632
1973	103.310	103.480
1974	147.070	147.861
1975	81.860	81.793
1976	119.690	118.725
1977	7.551	9.664
1978	167.966	166.747
1979	132.922	133.736
1980	68.871	68.567
1981	152.835	151.499
1982	106.676	105.730
1983	173.627	171.710
1984	55.403	55.538
1985	45.346	45.910
1986	52.294	52.859
1987	92.530	92.830
1988	35.322	35.991
1989	40.799	42.392
1990	42.053	43.591
1991	105.326	104.920
1992	119.963	120.101
1993	136.548	136.604
1994	104.525	104.030
1995	88.158	89.712
1996	171.717	174.820
1997	175.318	173.992
1998	155.712	157.779
1999	107.933	107.418
2000	52.321	52.106
2001	35.592	36.092
2002	162.355	160.578
2003	126.797	126.162
2004	35.118	35.381
2005	54.588	56.399
2006	105.794	105.211
2007	53.612	58.625
2008	66.236	67.620

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	353.7360	347.9420
2	175.3180	174.8200
3	173.6270	173.9920
4	171.7170	171.7100

5	167.9660	166.7470
6	162.3550	160.5780
7	155.7120	157.7790
8	154.8550	155.3260
9	152.8350	151.4990
10	147.0700	147.8610
11	145.0100	144.9340
12	136.5480	136.6040
13	135.3010	134.2840
14	133.1630	133.7360
15	132.9220	131.4780
16	126.7970	126.1620
17	124.7180	124.1810
18	123.7590	123.6090
19	120.9660	120.3720
20	119.9630	120.1010
21	119.6900	118.7250
22	114.1230	115.5350
23	113.5140	113.8930
24	110.5400	110.2780
25	110.1730	110.0730
26	107.9330	107.4180
27	106.6760	105.7300
28	105.7940	105.4680
29	105.3260	105.2110
30	104.5250	104.9200
31	104.3940	104.0300
32	103.3100	103.4800
33	102.3360	102.1560
34	102.2980	101.9890
35	101.7610	101.6920
36	96.2846	96.0091
37	92.5303	92.8297
38	92.1272	92.4818
39	90.6916	91.6320
40	88.1584	89.7122
41	83.5779	83.4038
42	81.8601	81.7930
43	73.7934	73.9729
44	68.8713	68.5665
45	66.2358	67.6195
46	63.9500	64.7695
47	55.4029	58.6251
48	54.6849	56.3989
49	54.5880	55.5378
50	53.6121	55.0833
51	52.3281	52.8594
52	52.3206	52.5764
53	52.2937	52.1056
54	45.3463	45.9104
55	42.0533	43.5906
56	40.7989	42.3919
57	35.5918	36.0924
58	35.3216	35.9914
59	35.1177	35.3810
60	7.5508	9.6637

Duration Flows

The Duration Matching Failed

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
49.9841	1153	1185	102	Fail
51.6478	1073	1108	103	Fail
53.3114	984	1022	103	Fail
54.9751	918	940	102	Fail
56.6387	839	867	103	Fail
58.3024	780	804	103	Fail
59.9661	718	741	103	Fail
61.6297	678	694	102	Fail
63.2934	628	639	101	Fail
64.9570	582	594	102	Fail
66.6207	529	541	102	Fail
68.2843	494	502	101	Fail
69.9480	463	467	100	Pass
71.6116	444	445	100	Pass
73.2753	411	419	101	Fail
74.9389	371	378	101	Fail
76.6026	350	358	102	Fail
78.2663	333	336	100	Pass
79.9299	320	319	99	Pass
81.5936	304	304	100	Pass
83.2572	286	290	101	Fail
84.9209	264	267	101	Fail
86.5845	247	250	101	Fail
88.2482	229	230	100	Pass
89.9118	218	219	100	Pass
91.5755	205	208	101	Fail
93.2391	188	191	101	Fail
94.9028	176	174	98	Pass
96.5664	159	159	100	Pass
98.2301	147	147	100	Pass
99.8938	137	137	100	Pass
101.5574	129	130	100	Pass
103.2211	122	123	100	Pass
104.8847	110	113	102	Pass
106.5484	106	102	96	Pass
108.2120	99	99	100	Pass
109.8757	96	95	98	Pass
111.5393	89	87	97	Pass
113.2030	84	80	95	Pass
114.8666	75	76	101	Pass
116.5303	73	72	98	Pass
118.1940	68	70	102	Pass
119.8576	65	64	98	Pass
121.5213	59	60	101	Pass
123.1849	56	56	100	Pass
124.8486	51	51	100	Pass
126.5122	49	48	97	Pass
128.1759	45	45	100	Pass
129.8395	44	43	97	Pass
131.5032	41	39	95	Pass
133.1668	39	39	100	Pass
134.8305	36	34	94	Pass
136.4942	33	33	100	Pass
138.1578	30	30	100	Pass

139.8215	28	28	100	Pass
141.4851	26	27	103	Pass
143.1488	25	23	92	Pass
144.8124	22	21	95	Pass
146.4761	18	19	105	Pass
148.1397	17	18	105	Pass
149.8034	17	16	94	Pass
151.4670	16	16	100	Pass
153.1307	15	14	93	Pass
154.7943	14	14	100	Pass
156.4580	12	13	108	Pass
158.1217	12	12	100	Pass
159.7853	12	12	100	Pass
161.4490	12	11	91	Pass
163.1126	11	11	100	Pass
164.7763	11	10	90	Pass
166.4399	10	10	100	Pass
168.1036	9	8	88	Pass
169.7672	8	8	100	Pass
171.4309	8	8	100	Pass
173.0945	7	7	100	Pass
174.7582	6	6	100	Pass
176.4219	5	5	100	Pass
178.0855	5	5	100	Pass
179.7492	5	5	100	Pass
181.4128	5	5	100	Pass
183.0765	5	5	100	Pass
184.7401	5	5	100	Pass
186.4038	5	5	100	Pass
188.0674	5	5	100	Pass
189.7311	5	5	100	Pass
191.3947	5	5	100	Pass
193.0584	5	5	100	Pass
194.7221	5	5	100	Pass
196.3857	5	5	100	Pass
198.0494	5	5	100	Pass
199.7130	5	5	100	Pass
201.3767	5	5	100	Pass
203.0403	5	5	100	Pass
204.7040	5	5	100	Pass
206.3676	5	5	100	Pass
208.0313	5	5	100	Pass
209.6949	5	5	100	Pass
211.3586	5	5	100	Pass
213.0222	5	5	100	Pass
214.6859	5	5	100	Pass

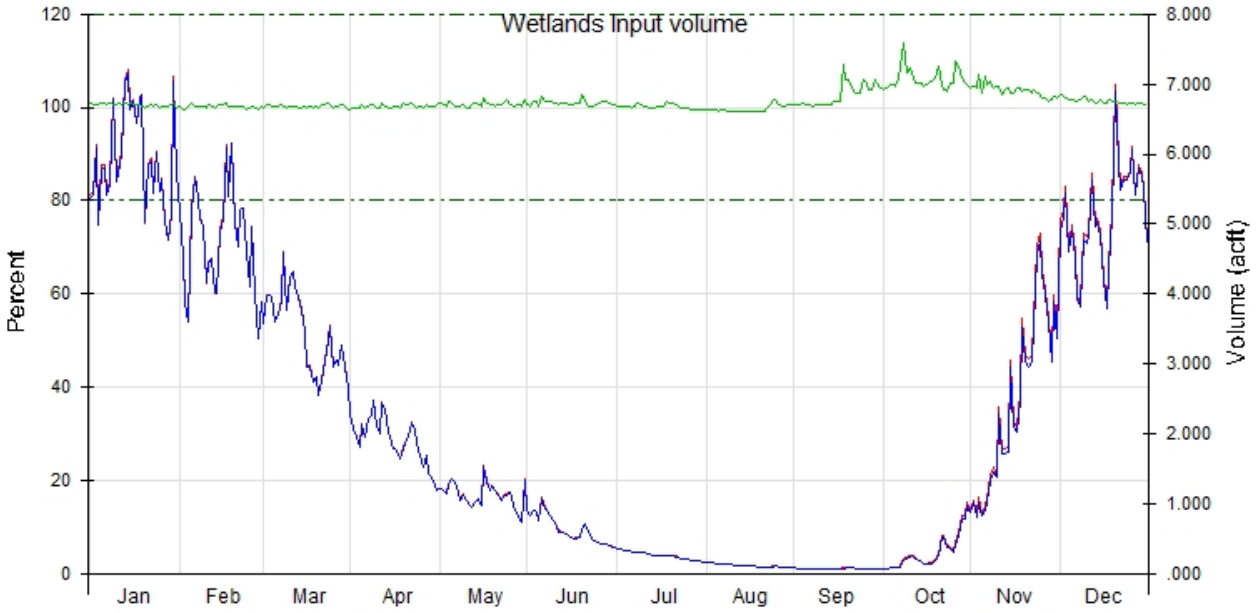
The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	1.1689 acre-feet
On-line facility target flow:	0.811 cfs.
Adjusted for 15 min:	0.811 cfs.
Off-line facility target flow:	0.501 cfs.
Adjusted for 15 min:	0.501 cfs.

Wetland Input Volumes



- Percent - Predeveloped - Mitigated

Wetlands Input Volume for POC 1
Average Annual Volume (acft)
Series 1: 501 POC 1 Predeveloped flow
Series 2: 801 POC 1 Mitigated flow

Month	Series 1	Series 2	Percent	Pass/Fail
Jan	182.1821	183.1683	100.5	Pass
Feb	136.8450	137.0983	100.2	Pass
Mar	107.1081	107.3392	100.2	Pass
Apr	57.8388	57.9557	100.2	Pass
May	34.8609	35.0896	100.7	Pass
Jun	19.2150	19.4069	101.0	Pass
Jul	8.2820	8.2970	100.2	Pass
Aug	3.6806	3.6659	99.6	Pass
Sep	2.0826	2.1358	102.6	Pass
Oct	8.6746	9.2000	106.1	Pass
Nov	71.7522	74.0875	103.3	Pass
Dec	156.4850	158.5522	101.3	Pass

Day	Predevel	Mitigated	Percent	Pass/Fail
Jan1	5.3794	5.4250	100.8	Pass
2	5.4103	5.4504	100.7	Pass
3	6.0881	6.1247	100.6	Pass
4	4.9976	5.0217	100.5	Pass
5	5.7807	5.8377	101.0	Pass
6	5.7860	5.8336	100.8	Pass
7	5.4273	5.4662	100.7	Pass
8	5.5653	5.6112	100.8	Pass
9	6.7647	6.8104	100.7	Pass
10	5.6059	5.6289	100.4	Pass
11	5.6996	5.7535	100.9	Pass
12	6.0217	6.0549	100.6	Pass
13	7.0109	7.0718	100.9	Pass
14	7.1635	7.1955	100.4	Pass

15	6.6440	6.7033	100.9	Pass
16	6.7579	6.7875	100.4	Pass
17	6.4319	6.4585	100.4	Pass
18	6.7751	6.8115	100.5	Pass
19	6.8400	6.8444	100.1	Pass
20	5.0286	5.0149	99.7	Pass
21	5.8445	5.8566	100.2	Pass
22	5.8951	5.9379	100.7	Pass
23	5.4432	5.4582	100.3	Pass
24	6.0038	6.0389	100.6	Pass
25	5.4725	5.4690	99.9	Pass
26	5.6405	5.6580	100.3	Pass
27	5.0521	5.0629	100.2	Pass
28	4.7620	4.7690	100.1	Pass
29	5.1227	5.1490	100.5	Pass
30	7.0500	7.1174	101.0	Pass
31	5.7417	5.7364	99.9	Pass
Feb1	5.1693	5.1776	100.2	Pass
2	4.5441	4.5245	99.6	Pass
3	3.8881	3.8738	99.6	Pass
4	3.6051	3.6108	100.2	Pass
5	5.1720	5.2246	101.0	Pass
6	5.6604	5.6761	100.3	Pass
7	5.5779	5.5916	100.2	Pass
8	5.0850	5.0982	100.3	Pass
9	4.9568	4.9610	100.1	Pass
10	4.1685	4.1598	99.8	Pass
11	4.4296	4.4570	100.6	Pass
12	4.5008	4.5137	100.3	Pass
13	4.0192	4.0107	99.8	Pass
14	4.0060	4.0189	100.3	Pass
15	4.8989	4.9242	100.5	Pass
16	5.0662	5.1034	100.7	Pass
17	6.0852	6.1322	100.8	Pass
18	5.4022	5.4090	100.1	Pass
19	6.1500	6.1645	100.2	Pass
20	5.0169	5.0248	100.2	Pass
21	4.6726	4.6785	100.1	Pass
22	5.2019	5.2108	100.2	Pass
23	5.2129	5.2269	100.3	Pass
24	4.6128	4.5961	99.6	Pass
25	4.1060	4.0989	99.8	Pass
26	4.9568	4.9677	100.2	Pass
27	4.0379	4.0308	99.8	Pass
28	3.3684	3.3519	99.5	Pass
29	3.8874	3.8984	100.3	Pass
Mar1	3.5832	3.5826	100.0	Pass
2	3.9576	3.9826	100.6	Pass
3	3.9785	3.9947	100.4	Pass
4	3.9592	3.9710	100.3	Pass
5	3.5912	3.5938	100.1	Pass
6	3.6975	3.7068	100.2	Pass
7	3.9023	3.9313	100.7	Pass
8	4.5916	4.6076	100.3	Pass
9	3.7620	3.7566	99.9	Pass
10	4.2325	4.2461	100.3	Pass
11	4.3110	4.3224	100.3	Pass
12	4.1006	4.1063	100.1	Pass

13	3.9515	3.9487	99.9	Pass
14	3.7816	3.7734	99.8	Pass
15	3.4592	3.4608	100.0	Pass
16	2.9584	2.9541	99.9	Pass
17	2.9609	2.9689	100.3	Pass
18	2.7419	2.7408	100.0	Pass
19	2.8099	2.8122	100.1	Pass
20	2.5492	2.5458	99.9	Pass
21	2.7540	2.7671	100.5	Pass
22	3.0213	3.0408	100.6	Pass
23	3.1672	3.1911	100.8	Pass
24	3.5343	3.5533	100.5	Pass
25	2.9595	2.9578	99.9	Pass
26	3.0548	3.0642	100.3	Pass
27	2.9831	2.9844	100.0	Pass
28	3.2561	3.2721	100.5	Pass
29	2.9652	2.9692	100.1	Pass
30	2.6453	2.6360	99.6	Pass
31	2.2876	2.2786	99.6	Pass
Apr1	2.0692	2.0629	99.7	Pass
2	1.9649	1.9652	100.0	Pass
3	1.8204	1.8188	99.9	Pass
4	2.1245	2.1346	100.5	Pass
5	1.9606	1.9589	99.9	Pass
6	2.2064	2.2119	100.2	Pass
7	2.2598	2.2757	100.7	Pass
8	2.4744	2.4870	100.5	Pass
9	2.1156	2.1095	99.7	Pass
10	1.9991	1.9948	99.8	Pass
11	2.4348	2.4547	100.8	Pass
12	2.3514	2.3560	100.2	Pass
13	2.0174	2.0169	100.0	Pass
14	1.8818	1.8797	99.9	Pass
15	1.7852	1.7859	100.0	Pass
16	1.7695	1.7716	100.1	Pass
17	1.6434	1.6423	99.9	Pass
18	1.7894	1.8043	100.8	Pass
19	1.8614	1.8723	100.6	Pass
20	1.9467	1.9561	100.5	Pass
21	2.1403	2.1622	101.0	Pass
22	2.0794	2.0841	100.2	Pass
23	1.8900	1.8869	99.8	Pass
24	1.6896	1.6904	100.0	Pass
25	1.5321	1.5305	99.9	Pass
26	1.6815	1.6939	100.7	Pass
27	1.4325	1.4331	100.0	Pass
28	1.3722	1.3774	100.4	Pass
29	1.2575	1.2599	100.2	Pass
30	1.2014	1.2090	100.6	Pass
May1	1.2146	1.2246	100.8	Pass
2	1.1862	1.1935	100.6	Pass
3	1.1403	1.1442	100.3	Pass
4	1.2608	1.2762	101.2	Pass
5	1.3560	1.3666	100.8	Pass
6	1.3018	1.3026	100.1	Pass
7	1.1592	1.1600	100.1	Pass
8	1.0527	1.0552	100.2	Pass
9	1.1291	1.1357	100.6	Pass

10	1.0513	1.0516	100.0	Pass
11	0.9724	0.9710	99.9	Pass
12	0.9579	0.9633	100.6	Pass
13	1.0182	1.0289	101.1	Pass
14	1.0681	1.0752	100.7	Pass
15	0.9652	0.9668	100.2	Pass
16	1.5273	1.5570	101.9	Pass
17	1.3116	1.3230	100.9	Pass
18	1.1937	1.2022	100.7	Pass
19	1.2655	1.2726	100.6	Pass
20	1.1797	1.1816	100.2	Pass
21	1.1265	1.1324	100.5	Pass
22	1.0482	1.0539	100.5	Pass
23	1.0993	1.1101	101.0	Pass
24	1.1176	1.1340	101.5	Pass
25	1.1664	1.1737	100.6	Pass
26	1.0068	1.0103	100.3	Pass
27	0.8921	0.8952	100.3	Pass
28	0.8355	0.8398	100.5	Pass
29	0.7311	0.7330	100.3	Pass
30	1.3243	1.3463	101.7	Pass
31	0.9151	0.9207	100.6	Pass
Jun1	0.8352	0.8360	100.1	Pass
2	0.8980	0.9099	101.3	Pass
3	0.8776	0.8875	101.1	Pass
4	0.7588	0.7615	100.4	Pass
5	1.0747	1.1018	102.5	Pass
6	0.9273	0.9406	101.4	Pass
7	0.9061	0.9179	101.3	Pass
8	0.8265	0.8358	101.1	Pass
9	0.7657	0.7719	100.8	Pass
10	0.6821	0.6883	100.9	Pass
11	0.6039	0.6075	100.6	Pass
12	0.5828	0.5889	101.0	Pass
13	0.5729	0.5788	101.0	Pass
14	0.5470	0.5508	100.7	Pass
15	0.5175	0.5205	100.6	Pass
16	0.4933	0.4958	100.5	Pass
17	0.5068	0.5114	100.9	Pass
18	0.5154	0.5198	100.8	Pass
19	0.6086	0.6254	102.7	Pass
20	0.7013	0.7128	101.6	Pass
21	0.6082	0.6100	100.3	Pass
22	0.5214	0.5216	100.0	Pass
23	0.4674	0.4676	100.0	Pass
24	0.4425	0.4451	100.6	Pass
25	0.4254	0.4290	100.8	Pass
26	0.4223	0.4280	101.4	Pass
27	0.4155	0.4203	101.1	Pass
28	0.4052	0.4087	100.9	Pass
29	0.3905	0.3932	100.7	Pass
30	0.3792	0.3816	100.6	Pass
Jul1	0.3634	0.3648	100.4	Pass
2	0.3508	0.3517	100.3	Pass
3	0.3397	0.3403	100.2	Pass
4	0.3309	0.3312	100.1	Pass
5	0.3221	0.3223	100.0	Pass
6	0.3141	0.3141	100.0	Pass

7	0.3094	0.3098	100.1	Pass
8	0.3161	0.3189	100.9	Pass
9	0.3107	0.3123	100.5	Pass
10	0.2981	0.2988	100.2	Pass
11	0.2864	0.2865	100.0	Pass
12	0.2765	0.2763	99.9	Pass
13	0.2680	0.2676	99.9	Pass
14	0.2611	0.2607	99.8	Pass
15	0.2609	0.2614	100.2	Pass
16	0.2576	0.2582	100.2	Pass
17	0.2492	0.2493	100.1	Pass
18	0.2518	0.2546	101.1	Pass
19	0.2498	0.2523	101.0	Pass
20	0.2588	0.2609	100.8	Pass
21	0.2471	0.2485	100.6	Pass
22	0.2307	0.2308	100.0	Pass
23	0.2177	0.2173	99.8	Pass
24	0.2082	0.2076	99.7	Pass
25	0.2012	0.2005	99.7	Pass
26	0.1946	0.1939	99.6	Pass
27	0.1891	0.1883	99.6	Pass
28	0.1845	0.1837	99.6	Pass
29	0.1797	0.1790	99.6	Pass
30	0.1745	0.1737	99.5	Pass
31	0.1694	0.1685	99.5	Pass
Aug1	0.1646	0.1636	99.4	Pass
2	0.1601	0.1591	99.4	Pass
3	0.1556	0.1546	99.4	Pass
4	0.1512	0.1502	99.3	Pass
5	0.1471	0.1460	99.3	Pass
6	0.1436	0.1427	99.4	Pass
7	0.1402	0.1393	99.4	Pass
8	0.1360	0.1351	99.3	Pass
9	0.1319	0.1309	99.2	Pass
10	0.1280	0.1270	99.2	Pass
11	0.1243	0.1233	99.2	Pass
12	0.1208	0.1198	99.2	Pass
13	0.1174	0.1163	99.1	Pass
14	0.1152	0.1143	99.2	Pass
15	0.1126	0.1118	99.2	Pass
16	0.1090	0.1081	99.2	Pass
17	0.1055	0.1046	99.1	Pass
18	0.1030	0.1021	99.1	Pass
19	0.1021	0.1014	99.2	Pass
20	0.0989	0.0981	99.2	Pass
21	0.0956	0.0948	99.2	Pass
22	0.0958	0.0957	99.8	Pass
23	0.0975	0.0980	100.6	Pass
24	0.1032	0.1050	101.7	Pass
25	0.1058	0.1072	101.3	Pass
26	0.0995	0.1003	100.7	Pass
27	0.0922	0.0926	100.4	Pass
28	0.0874	0.0877	100.3	Pass
29	0.0850	0.0854	100.6	Pass
30	0.0820	0.0824	100.5	Pass
31	0.0813	0.0818	100.5	Pass
Sep1	0.0793	0.0797	100.5	Pass
2	0.0767	0.0770	100.4	Pass

3	0.0758	0.0764	100.8	Pass
4	0.0743	0.0748	100.7	Pass
5	0.0718	0.0721	100.5	Pass
6	0.0694	0.0696	100.3	Pass
7	0.0674	0.0675	100.2	Pass
8	0.0663	0.0666	100.4	Pass
9	0.0655	0.0659	100.6	Pass
10	0.0645	0.0649	100.7	Pass
11	0.0626	0.0629	100.5	Pass
12	0.0611	0.0614	100.5	Pass
13	0.0606	0.0610	100.7	Pass
14	0.0623	0.0631	101.2	Pass
15	0.0612	0.0620	101.2	Pass
16	0.0601	0.0608	101.3	Pass
17	0.0771	0.0842	109.3	Pass
18	0.0772	0.0817	105.8	Pass
19	0.0829	0.0877	105.8	Pass
20	0.0846	0.0882	104.2	Pass
21	0.0756	0.0780	103.2	Pass
22	0.0689	0.0709	103.0	Pass
23	0.0651	0.0670	103.0	Pass
24	0.0673	0.0712	105.8	Pass
25	0.0688	0.0723	105.1	Pass
26	0.0642	0.0666	103.7	Pass
27	0.0608	0.0630	103.6	Pass
28	0.0648	0.0687	106.0	Pass
29	0.0653	0.0686	105.2	Pass
30	0.0710	0.0739	104.0	Pass
Oct1	0.0697	0.0723	103.7	Pass
2	0.0700	0.0728	104.1	Pass
3	0.0719	0.0751	104.4	Pass
4	0.0809	0.0848	104.8	Pass
5	0.0838	0.0876	104.5	Pass
6	0.0857	0.0906	105.8	Pass
7	0.1017	0.1107	108.8	Pass
8	0.1816	0.2070	114.0	Pass
9	0.2217	0.2381	107.4	Pass
10	0.2321	0.2521	108.6	Pass
11	0.2510	0.2695	107.4	Pass
12	0.2208	0.2321	105.1	Pass
13	0.1870	0.1970	105.4	Pass
14	0.1657	0.1742	105.1	Pass
15	0.1398	0.1462	104.5	Pass
16	0.1342	0.1409	105.0	Pass
17	0.1507	0.1593	105.7	Pass
18	0.1449	0.1531	105.7	Pass
19	0.1778	0.1887	106.1	Pass
20	0.2522	0.2746	108.9	Pass
21	0.5139	0.5388	104.8	Pass
22	0.5222	0.5416	103.7	Pass
23	0.3902	0.4034	103.4	Pass
24	0.3543	0.3727	105.2	Pass
25	0.3110	0.3275	105.3	Pass
26	0.4016	0.4412	109.9	Pass
27	0.5361	0.5838	108.9	Pass
28	0.7916	0.8408	106.2	Pass
29	0.7891	0.8308	105.3	Pass
30	0.9707	1.0191	105.0	Pass

31	0.8877	0.9234	104.0	Pass
Nov1	1.0117	1.0564	104.4	Pass
2	0.8106	0.8454	104.3	Pass
3	1.0136	1.0839	106.9	Pass
4	0.8212	0.8479	103.3	Pass
5	0.9151	0.9763	106.7	Pass
6	1.0168	1.0664	104.9	Pass
7	1.3261	1.4006	105.6	Pass
8	1.4560	1.5140	104.0	Pass
9	1.3748	1.4357	104.4	Pass
10	2.2895	2.3912	104.4	Pass
11	1.7205	1.7702	102.9	Pass
12	1.7168	1.7845	103.9	Pass
13	1.7392	1.8106	104.1	Pass
14	2.9469	3.0411	103.2	Pass
15	2.0944	2.1611	103.2	Pass
16	2.0167	2.0981	104.0	Pass
17	2.4844	2.5912	104.3	Pass
18	3.5358	3.6586	103.5	Pass
19	3.0193	3.1288	103.6	Pass
20	2.9534	3.0653	103.8	Pass
21	3.0196	3.1148	103.2	Pass
22	3.4992	3.6272	103.7	Pass
23	4.5699	4.7110	103.1	Pass
24	4.7522	4.8737	102.6	Pass
25	4.2831	4.3650	101.9	Pass
26	3.9813	4.0660	102.1	Pass
27	3.5992	3.6484	101.4	Pass
28	3.0248	3.0692	101.5	Pass
29	3.8788	3.9737	102.4	Pass
30	3.3611	3.4261	101.9	Pass
Dec1	4.9128	5.0463	102.7	Pass
2	5.0746	5.1993	102.5	Pass
3	5.4338	5.5362	101.9	Pass
4	4.6047	4.6805	101.6	Pass
5	4.9144	4.9974	101.7	Pass
6	4.5146	4.5794	101.4	Pass
7	3.9281	3.9768	101.2	Pass
8	3.8234	3.8899	101.7	Pass
9	4.7679	4.8749	102.2	Pass
10	4.7274	4.8255	102.1	Pass
11	4.8363	4.9005	101.3	Pass
12	5.6419	5.7247	101.5	Pass
13	4.9588	5.0079	101.0	Pass
14	5.0380	5.0912	101.1	Pass
15	4.8381	4.9148	101.6	Pass
16	4.2070	4.2393	100.8	Pass
17	3.7895	3.8221	100.9	Pass
18	4.3385	4.4142	101.7	Pass
19	5.1035	5.1715	101.3	Pass
20	6.8860	6.9864	101.5	Pass
21	5.8747	5.9338	101.0	Pass
22	5.4783	5.5356	101.0	Pass
23	5.6331	5.6866	101.0	Pass
24	5.6301	5.6547	100.4	Pass
25	5.7145	5.7755	101.1	Pass
26	6.0543	6.1109	100.9	Pass
27	5.4042	5.4349	100.6	Pass

28	5.7946	5.8465	100.9	Pass
29	5.6717	5.7179	100.8	Pass
30	5.5212	5.5460	100.4	Pass
31	4.7207	4.7492	100.6	Pass

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1	☐	1372.38			☐	0.00			
Total Volume Infiltrated		1372.38	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

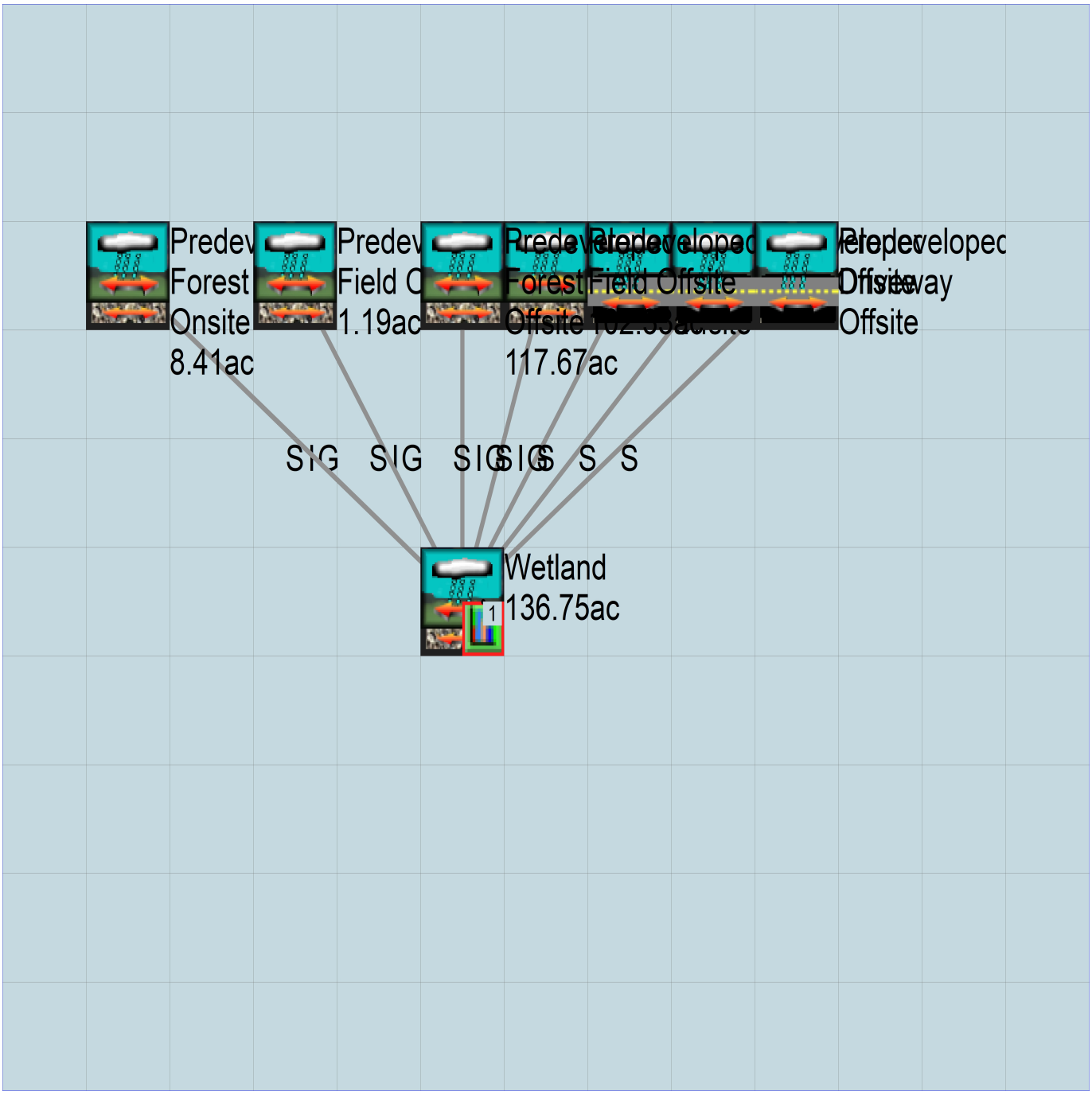
No PERLND changes have been made.

IMPLND Changes

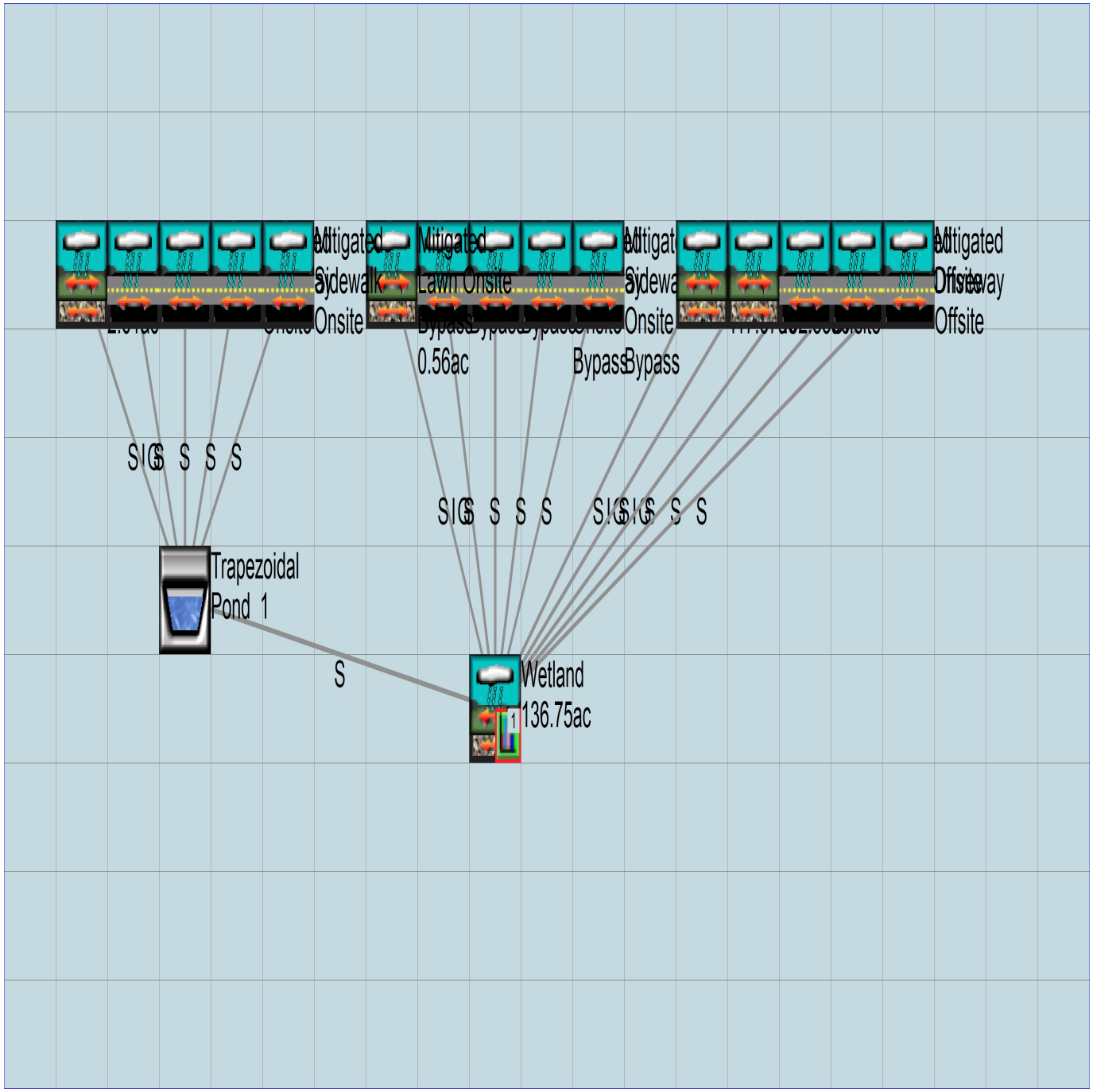
No IMPLND changes have been made.

Appendix

Predeveloped Schematic



Mitigated Schematic



Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Hyroperiod Protection Final.wdm
MESSU       25   PreHyroperiod Protection Final.MES
            27   PreHyroperiod Protection Final.L61
            28   PreHyroperiod Protection Final.L62
            30   POCHyroperiod Protection Final1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      47
      PERLND      48
      IMPLND      28
      IMPLND      29
      IMPLND      30
      PERLND      54
      PERLND      55
      PERLND      56
      COPY       501
      COPY         1
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Wetland                    MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out             ***
   47     SG4, Forest, Mod        1    1    1    1   27    0
   48     SG4, Forest, Mod        1    1    1    1   27    0
   54     SG4, Field, Mod         1    1    1    1   27    0
   55     SG4, Forest, Mod        1    1    1    1   27    0
   56     SG4, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***
```

```
ACTIVITY
  <PLS > ************ Active Sections ******************************
  # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
 47         0    0    1    0    0    0    0    0    0    0    0    0
 48         0    0    1    0    0    0    0    0    0    0    0    0
 54         0    0    1    0    0    0    0    0    0    0    0    0
 55         0    0    1    0    0    0    0    0    0    0    0    0
 56         0    0    1    0    0    0    0    0    0    0    0    0
END ACTIVITY

PRINT-INFO
  <PLS > ***************** Print-flags **************************** PIVL  PYR
  # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
 47         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 48         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 54         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 55         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 56         0    0    4    0    0    0    0    0    0    0    0    0    1    9
END PRINT-INFO

PWAT-PARM1
  <PLS >  PWATER variable monthly parameter value flags  ***
  # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
 47         0    0    0    0    0    0    0    0    0    0    0
 48         0    0    0    0    0    0    0    0    0    0    0
 54         0    0    0    0    0    0    0    0    0    0    0
 55         0    0    0    0    0    0    0    0    0    0    0
 56         0    0    0    0    0    0    0    0    0    0    0
END PWAT-PARM1

PWAT-PARM2
  <PLS >      PWATER input info: Part 2          ***
  # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
 47              0         6      0.04       400       0.1         0      0.96
 48              0         6      0.04       400       0.1         0      0.96
 54              0         6      0.03       400       0.1         0      0.96
 55              0         6      0.04       400       0.1         0      0.96
 56              0         6      0.04       400       0.1         0      0.96
END PWAT-PARM2

PWAT-PARM3
  <PLS >      PWATER input info: Part 3          ***
  # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
 47              0         0         3         2         0         0         0
 48              0         0         3         2         0         0         0
 54              0         0         3         2         0         0         0
 55              0         0         3         2         0         0         0
 56              0         0         3         2         0         0         0
END PWAT-PARM3
PWAT-PARM4
  <PLS >     PWATER input info: Part 4                              ***
  # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
 47            0.2       0.4      0.35         2       0.4       0.7
 48            0.2       0.4      0.35         2       0.4       0.7
 54           0.15       0.4       0.3         2       0.4       0.4
 55            0.2       0.4      0.35         2       0.4       0.7
 56            0.2       0.4      0.35         2       0.4       0.7
END PWAT-PARM4

PWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
  # -  # ***  CEPS      SURS       UZS      IFWS       LZS       AGWS      GWVS
 47              0         0         0         0       2.5          1         0
 48              0         0         0         0       2.5          1         0
 54              0         0         0         0       2.5          1         0
 55              0         0         0         0       2.5          1         0
 56              0         0         0         0       2.5          1         0
END PWAT-STATE1
```

```
END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                    in  out           ***
   28      ROADS/FLAT             1    1    1   27    0
   29      ROOF TOPS/FLAT         1    1    1   27    0
   30      DRIVEWAYS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
   28         0    0    1    0    0    0
   29         0    0    1    0    0    0
   30         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
   28         0    0    4    0    0    0    1    9
   29         0    0    4    0    0    0    1    9
   30         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
   28         0    0    0    0    0
   29         0    0    0    0    0
   30         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
   28          400      0.01       0.1        0.1
   29          400      0.01       0.1        0.1
   30          400      0.01       0.1        0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
   28             0         0
   29             0         0
   30             0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
   28             0         0
   29             0         0
   30             0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Predeveloped Roads Offsite***
IMPLND  28                    0.0291     PERLND  56     50
Predeveloped Forest Onsite***
PERLND  47                    0.0615     PERLND  56     30
```

```
PERLND  47                      0.0615     PERLND  56     34
PERLND  47                      0.0615     PERLND  56     38
Predeveloped Field Onsite***
PERLND  48                      0.0087     PERLND  56     30
PERLND  48                      0.0087     PERLND  56     34
PERLND  48                      0.0087     PERLND  56     38
Predeveloped Roofs Offsite***
IMPLND  29                      0.0657     PERLND  56     50
Predeveloped Driveway Offsite***
IMPLND  30                      0.0343     PERLND  56     50
Predeveloped Field Offsite***
PERLND  54                      0.7483     PERLND  56     30
PERLND  54                      0.7483     PERLND  56     34
PERLND  54                      0.7483     PERLND  56     38
Predeveloped Forest Offsite***
PERLND  55                      0.8605     PERLND  56     30
PERLND  55                      0.8605     PERLND  56     34
PERLND  55                      0.8605     PERLND  56     38
Wetland***
PERLND  56                    136.745      COPY   501     12
PERLND  56                    136.745      COPY   501     13
PERLND  56                    136.745      COPY   501     14

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<-----------------><---> User T-series  Engl Metr LKFG            ***
                                      in  out                               ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                 ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><--------->      ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                    ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
```

```
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       14
PERLND     PWATER AGWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   14

  MASS-LINK       30
PERLND     PWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   30

  MASS-LINK       34
PERLND     PWATER IFWO                     PERLND         EXTNL  IFWLI
  END MASS-LINK   34

  MASS-LINK       38
PERLND     PWATER AGWO                     PERLND         EXTNL  AGWLI
  END MASS-LINK   38

  MASS-LINK       50
IMPLND     IWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   50


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   Hyroperiod Protection Final.wdm
MESSU       25   MitHyroperiod Protection Final.MES
            27   MitHyroperiod Protection Final.L61
            28   MitHyroperiod Protection Final.L62
            30   POCHyroperiod Protection Final1.dat
END FILES

OPN SEQUENCE
    INGRP               INDELT 00:15
      PERLND      49
      IMPLND      17
      IMPLND      18
      IMPLND      19
      IMPLND      20
      PERLND      50
      IMPLND      21
      IMPLND      22
      IMPLND      23
      IMPLND      24
      PERLND      52
      PERLND      53
      IMPLND      25
      IMPLND      26
      IMPLND      27
      RCHRES       1
      PERLND      51
      COPY        501
      COPY          1
      DISPLY        1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Wetland                    MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1          1    1
  501          1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
```

```
                                          in  out           ***
 49     SG4, Lawn, Mod          1    1    1    1   27    0
 50     SG4, Lawn, Mod          1    1    1    1   27    0
 52     SG4, Forest, Mod        1    1    1    1   27    0
 53     SG4, Field, Mod         1    1    1    1   27    0
 51     SG4, Forest, Mod        1    1    1    1   27    0
END GEN-INFO
*** Section PWATER***

ACTIVITY
  <PLS > ************ Active Sections ******************************
  # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
 49         0    0    1    0    0    0    0    0    0    0    0    0
 50         0    0    1    0    0    0    0    0    0    0    0    0
 52         0    0    1    0    0    0    0    0    0    0    0    0
 53         0    0    1    0    0    0    0    0    0    0    0    0
 51         0    0    1    0    0    0    0    0    0    0    0    0
END ACTIVITY

PRINT-INFO
  <PLS > ***************** Print-flags ***************************** PIVL  PYR
  # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
 49         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 50         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 52         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 53         0    0    4    0    0    0    0    0    0    0    0    0    1    9
 51         0    0    4    0    0    0    0    0    0    0    0    0    1    9
END PRINT-INFO

PWAT-PARM1
  <PLS >  PWATER variable monthly parameter value flags  ***
  # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
 49         0    0    0    0    0    0    0    0    0    0    0
 50         0    0    0    0    0    0    0    0    0    0    0
 52         0    0    0    0    0    0    0    0    0    0    0
 53         0    0    0    0    0    0    0    0    0    0    0
 51         0    0    0    0    0    0    0    0    0    0    0
END PWAT-PARM1

PWAT-PARM2
  <PLS >      PWATER input info: Part 2         ***
  # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
 49              0         6      0.02       400       0.1         0      0.96
 50              0         6      0.02       400       0.1         0      0.96
 52              0         6      0.04       400       0.1         0      0.96
 53              0         6      0.03       400       0.1         0      0.96
 51              0         6      0.04       400       0.1         0      0.96
END PWAT-PARM2

PWAT-PARM3
  <PLS >      PWATER input info: Part 3         ***
  # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
 49              0         0         3         2         0         0         0
 50              0         0         3         2         0         0         0
 52              0         0         3         2         0         0         0
 53              0         0         3         2         0         0         0
 51              0         0         3         2         0         0         0
END PWAT-PARM3
PWAT-PARM4
  <PLS >     PWATER input info: Part 4                              ***
  # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
 49            0.1       0.2      0.25         2       0.4      0.25
 50            0.1       0.2      0.25         2       0.4      0.25
 52            0.2       0.4      0.35         2       0.4       0.7
 53           0.15       0.4       0.3         2       0.4       0.4
 51            0.2       0.4      0.35         2       0.4       0.7
END PWAT-PARM4

PWAT-STATE1
  <PLS > *** Initial conditions at start of simulation
```

```
            ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS       IFWS       LZS       AGWS       GWVS
   49             0         0         0          0       2.5          1          0
   50             0         0         0          0       2.5          1          0
   52             0         0         0          0       2.5          1          0
   53             0         0         0          0       2.5          1          0
   51             0         0         0          0       2.5          1          0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out            ***
   17      ROADS/FLAT             1    1    1   27    0
   18      ROOF TOPS/FLAT         1    1    1   27    0
   19      DRIVEWAYS/FLAT         1    1    1   27    0
   20      SIDEWALKS/FLAT         1    1    1   27    0
   21      ROADS/FLAT             1    1    1   27    0
   22      ROOF TOPS/FLAT         1    1    1   27    0
   23      DRIVEWAYS/FLAT         1    1    1   27    0
   24      SIDEWALKS/FLAT         1    1    1   27    0
   25      ROADS/FLAT             1    1    1   27    0
   26      ROOF TOPS/FLAT         1    1    1   27    0
   27      DRIVEWAYS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    ***
   17          0    0    1    0    0    0
   18          0    0    1    0    0    0
   19          0    0    1    0    0    0
   20          0    0    1    0    0    0
   21          0    0    1    0    0    0
   22          0    0    1    0    0    0
   23          0    0    1    0    0    0
   24          0    0    1    0    0    0
   25          0    0    1    0    0    0
   26          0    0    1    0    0    0
   27          0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL     *********
   17          0    0    4    0    0    0    1    9
   18          0    0    4    0    0    0    1    9
   19          0    0    4    0    0    0    1    9
   20          0    0    4    0    0    0    1    9
   21          0    0    4    0    0    0    1    9
   22          0    0    4    0    0    0    1    9
   23          0    0    4    0    0    0    1    9
   24          0    0    4    0    0    0    1    9
   25          0    0    4    0    0    0    1    9
   26          0    0    4    0    0    0    1    9
   27          0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
   17          0    0    0    0    0
   18          0    0    0    0    0
   19          0    0    0    0    0
   20          0    0    0    0    0
   21          0    0    0    0    0
```

```
   22         0    0    0    0    0
   23         0    0    0    0    0
   24         0    0    0    0    0
   25         0    0    0    0    0
   26         0    0    0    0    0
   27         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
   17            400      0.01       0.1       0.1
   18            400      0.01       0.1       0.1
   19            400      0.01       0.1       0.1
   20            400      0.01       0.1       0.1
   21            400      0.01       0.1       0.1
   22            400      0.01       0.1       0.1
   23            400      0.01       0.1       0.1
   24            400      0.01       0.1       0.1
   25            400      0.01       0.1       0.1
   26            400      0.01       0.1       0.1
   27            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
   17              0         0
   18              0         0
   19              0         0
   20              0         0
   21              0         0
   22              0         0
   23              0         0
   24              0         0
   25              0         0
   26              0         0
   27              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
   17              0         0
   18              0         0
   19              0         0
   20              0         0
   21              0         0
   22              0         0
   23              0         0
   24              0         0
   25              0         0
   26              0         0
   27              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                <--Area-->     <-Target->   MBLK   ***
<Name>   #                <-factor->     <Name>   #   Tbl#   ***
Mitigated Lawn Onsite***
PERLND  49                    2.6095     RCHRES   1      2
PERLND  49                    2.6095     RCHRES   1      3
PERLND  49                    2.6095     RCHRES   1      4
Mitigated Road Onsite Bypass***
IMPLND  17                    0.0008     PERLND  51     50
Mitigated Roof Onsite Bypass***
IMPLND  18                    0.0032     PERLND  51     50
Mitigated Roofs Offsite***
```

```
IMPLND  26                      0.0657     PERLND  51     50
Mitigated Driveway Onsite Bypass***
IMPLND  19                      0.0003     PERLND  51     50
Mitigated Lawn Onsite Bypass***
PERLND  50                      0.0041     PERLND  51     30
PERLND  50                      0.0041     PERLND  51     34
PERLND  50                      0.0041     PERLND  51     38
Mitigated Sidewalk Onsite Bypass***
IMPLND  20                      0.0003     PERLND  51     50
Mitigated Road Onsite***
IMPLND  21                      1.2737     RCHRES   1      5
Mitigated Forest Offsite***
PERLND  52                      0.8605     PERLND  51     30
PERLND  52                      0.8605     PERLND  51     34
PERLND  52                      0.8605     PERLND  51     38
Mitigated Roof Onsite***
IMPLND  22                      3.8738     RCHRES   1      5
Mitigated Field Offsite***
PERLND  53                      0.7483     PERLND  51     30
PERLND  53                      0.7483     PERLND  51     34
PERLND  53                      0.7483     PERLND  51     38
Mitigated Driveway Onsite***
IMPLND  23                      0.2663     RCHRES   1      5
Mitigated Sidewalk Onsite***
IMPLND  24                      0.3849     RCHRES   1      5
Mitigated Roads Offsite***
IMPLND  25                      0.0291     PERLND  51     50
Mitigated Driveway Offsite***
IMPLND  27                      0.0343     PERLND  51     50
Wetland***
PERLND  51                    136.745      COPY   501     12
PERLND  51                    136.745      COPY   501     13
PERLND  51                    136.745      COPY   501     14

******Routing******
RCHRES   1                       .0073     PERLND  51     60
RCHRES   1                                 COPY     1     16
IMPLND  17                      0.1108     COPY     1     15
IMPLND  18                      0.4441     COPY     1     15
IMPLND  19                      0.0367     COPY     1     15
IMPLND  20                      0.0396     COPY     1     15
PERLND  50                      0.5556     COPY     1     12
PERLND  50                      0.5556     COPY     1     13
PERLND  50                      0.5556     COPY     1     14
PERLND  52                    117.672      COPY     1     12
PERLND  52                    117.672      COPY     1     13
PERLND  52                    117.672      COPY     1     14
PERLND  53                    102.329      COPY     1     12
PERLND  53                    102.329      COPY     1     13
PERLND  53                    102.329      COPY     1     14
IMPLND  25                      3.973      COPY     1     15
IMPLND  26                      8.983      COPY     1     15
IMPLND  27                      4.685      COPY     1     15
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<----------------><---> User T-series  Engl Metr LKFG             ***
```

```
                                          in  out                                 ***
    1     Trapezoidal Pond-005    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                       ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
           FG FG FG FG  possible  exit  *** possible  exit      possible  exit
            *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0       2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1             1      0.02       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                          ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1           0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.105601  0.000000  0.000000
  0.055556  0.106721  0.005898  0.129523
  0.111111  0.107846  0.011858  0.183173
  0.166667  0.108976  0.017881  0.224341
  0.222222  0.110111  0.023967  0.259046
  0.277778  0.111251  0.030116  0.289623
  0.333333  0.112397  0.036328  0.317266
  0.388889  0.113547  0.042604  0.342686
  0.444444  0.114703  0.048945  0.366347
  0.500000  0.115863  0.055349  0.388570
  0.555556  0.117029  0.061818  0.409588
  0.611111  0.118200  0.068353  0.429580
  0.666667  0.119376  0.074952  0.448681
  0.722222  0.120557  0.081617  0.467002
  0.777778  0.121743  0.088347  0.484631
  0.833333  0.122934  0.095144  0.501641
  0.888889  0.124130  0.102007  0.518093
  0.944444  0.125332  0.108936  0.534038
  1.000000  0.126538  0.115932  0.549520
  1.055556  0.127750  0.122996  0.564578
  1.111111  0.128966  0.130127  0.579245
  1.166667  0.130188  0.137326  0.593550
  1.222222  0.131415  0.144593  0.607518
  1.277778  0.132647  0.151928  0.621171
```

```
  1.333333  0.133884  0.159331  0.634531
  1.388889  0.135127  0.166804  0.647616
  1.444444  0.136374  0.174345  0.660441
  1.500000  0.137626  0.181957  0.673022
  1.555556  0.138884  0.189637  0.685372
  1.611111  0.140146  0.197388  0.697504
  1.666667  0.141414  0.205209  0.709428
  1.722222  0.142687  0.213101  0.721155
  1.777778  0.143965  0.221064  0.732694
  1.833333  0.145248  0.229097  0.744054
  1.888889  0.146536  0.237202  0.755243
  1.944444  0.147829  0.245379  0.766269
  2.000000  0.149128  0.253628  0.777139
  2.055556  0.150431  0.261949  0.787859
  2.111111  0.151740  0.270343  0.798435
  2.166667  0.153053  0.278809  0.808872
  2.222222  0.154372  0.287349  0.819177
  2.277778  0.155696  0.295962  0.829353
  2.333333  0.157025  0.304648  0.839406
  2.388889  0.158359  0.313409  0.849340
  2.444444  0.159698  0.322244  0.859160
  2.500000  0.161042  0.331153  0.868868
  2.555556  0.162392  0.340138  0.878469
  2.611111  0.163746  0.349197  0.887966
  2.666667  0.165106  0.358332  0.897363
  2.722222  0.166470  0.367542  0.906662
  2.777778  0.167840  0.376829  0.919700
  2.833333  0.169215  0.386191  0.944674
  2.888889  0.170595  0.395631  0.975899
  2.944444  0.171980  0.405147  1.011547
  3.000000  0.173370  0.414740  1.050656
  3.055556  0.174765  0.424410  1.092588
  3.111111  0.176166  0.434158  1.136869
  3.166667  0.177571  0.443984  1.183127
  3.222222  0.178982  0.453888  1.231054
  3.277778  0.180397  0.463871  1.280392
  3.333333  0.181818  0.473933  1.330913
  3.388889  0.183244  0.484073  1.382417
  3.444444  0.184675  0.494293  1.434725
  3.500000  0.186111  0.504593  1.487674
  3.555556  0.187552  0.514972  1.541116
  3.611111  0.188999  0.525432  1.594913
  3.666667  0.190450  0.535972  1.648938
  3.722222  0.191906  0.546593  1.703070
  3.777778  0.193368  0.557295  1.762017
  3.833333  0.194835  0.568079  1.826861
  3.888889  0.196306  0.578944  1.893130
  3.944444  0.197783  0.589891  1.960789
  4.000000  0.199265  0.600920  2.029804
  4.055556  0.200752  0.612032  2.245681
  4.111111  0.202245  0.623226  2.632769
  4.166667  0.203742  0.634503  3.126736
  4.222222  0.205244  0.645864  3.696865
  4.277778  0.206752  0.657308  4.316161
  4.333333  0.208264  0.668837  4.957200
  4.388889  0.209782  0.680449  5.591911
  4.444444  0.211305  0.692146  6.192887
  4.500000  0.212833  0.703928  6.735564
  4.555556  0.214366  0.715794  7.200999
  4.611111  0.215904  0.727746  7.579117
  4.666667  0.217447  0.739784  7.872357
  4.722222  0.218996  0.751907  8.099668
  4.777778  0.220549  0.764117  8.381765
  4.833333  0.222107  0.776413  8.608088
  4.888889  0.223671  0.788795  8.827173
  4.944444  0.225240  0.801265  9.039685
  5.000000  0.226814  0.813822  9.246196
  END FTABLE  1
END FTABLES
```

```
EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3           PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3           IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8           PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8           IMPLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8           RCHRES   1     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK        2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    2

  MASS-LINK        3
PERLND     PWATER IFWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    3

  MASS-LINK        4
PERLND     PWATER AGWO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    4

  MASS-LINK        5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK    5

  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13

  MASS-LINK       14
PERLND     PWATER AGWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   14

  MASS-LINK       15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   15

  MASS-LINK       16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK   16

  MASS-LINK       30
PERLND     PWATER SURO                     PERLND         EXTNL  SURLI
  END MASS-LINK   30

  MASS-LINK       34
PERLND     PWATER IFWO                     PERLND         EXTNL  IFWLI
  END MASS-LINK   34

  MASS-LINK       38
PERLND     PWATER AGWO                     PERLND         EXTNL  AGWLI
  END MASS-LINK   38

  MASS-LINK       50
```

```
IMPLND     IWATER SURO                    PERLND         EXTNL  SURLI
  END MASS-LINK   50

  MASS-LINK       60
RCHRES     ROFLOW            12.00000    PERLND         EXTNL  SURLI
  END MASS-LINK   60


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

Legal Notice

This program and accompanying documentation are provided 'as-is' without warranty of any kind. The entire risk regarding the performance and results of this program is assumed by End User. Clear Creek Solutions Inc. and the governmental licensee or sublicensees disclaim all warranties, either expressed or implied, including but not limited to implied warranties of program and accompanying documentation. In no event shall Clear Creek Solutions Inc. be liable for any damages whatsoever (including without limitation to damages for loss of business profits, loss of business information, business interruption, and the like) arising out of the use of, or inability to use this program even if Clear Creek Solutions Inc. or their authorized representatives have been advised of the possibility of such damages. Software Copyright © by : Clear Creek Solutions, Inc. 2005-2025; All Rights Reserved.

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

APPENDIX C

Geotechnical Report

TRUE NORTH
GEOTECHNICAL

Pacific Lifestyle Homes
Geotechnical Engineering Evaluation

Landing at Green Mountain Phase 2
22111, 22015, & 22007 NE 28th St
Camas, Washington

True North Project No. 24-0431-2

April 2025 (revised June 2025)

April 18, 2025 (revised June 17, 2025)

Pacific Lifestyle Homes (PLH)
11815 NE 99th Street, Suite 1200
Vancouver, WA 98682
Attn: Nick Edwards
Email: nicke@buildplh.com

Subject: Geotechnical Engineering Evaluation
Landing at Green Mountain Phase 2
22111, 22015, & 22007 NE 28th St
Camas, Clark County, Washington
Clark County Parcel Nos. 173169000, 173210000, & 173177000
True North Project # 24-0431-2

True North Geotechnical Services (True North) is pleased to submit our finalized Geotechnical Engineering Evaluation for the project noted above. This report was prepared in accordance with "True North Geotechnical - General Services Agreement (GSA) P24-0431-2" dated March 19, 2025, which was authorized by Samantha Zimmer with PLH on March 24, 2025. This report is intended to build off our conclusions summarized in our previously issued report, "Preliminary Geotechnical Engineering Evaluation – Landing at Green Mountain Phase 2", dated January 30, 2025. This report summarizes the entirety of our work accomplished and provides our geotechnical recommendations for development of the property with the proposed Landing at Green Mountain Phase 2 development.

PROJECT UNDERSTANDING

Our current understanding of the project is based on the information provided to True North by Pacific Lifestyle Homes (PLH). We have been provided the following document related to the proposed project:

- **A one-page sketch, untitled, undated, unsigned**. This pre-application drawing shows the layout of the proposed development, including 57 single-family lots, a network of 2-lane local streets, and the proposed stormwater facility. The proposed development is overlain on the site's existing conditions and includes an existing Bonneville Power Administration (BPA) transmission line easement.

Briefly, we understand that the subdivision will be developed with 57 single-family residential lots with concrete driveways. The remainder of the property will be developed with asphalt paved roads, associated utilities, landscape/hardscape, and stormwater management facilities. It is our understanding that the existing residence within the central property will remain, as will approximately an acre of pasture at the south of the residence.

We understand this project is in the preliminary planning stages. As such, we have not been provided any structural drawings or foundation loads other than an indication that the single-family residences will be 1- or 2-story buildings. Preliminarily, we have assumed that maximum building loads will on the order of be 4 kips per linear foot for continuous wall footings, 25 kips per isolated column footing, and 150 psf for floor slabs on grade. As the site is generally flat, or gently sloped, we anticipate cuts and fills no greater than 2 to 4 feet, with the exception of utility trenches, and assuming the proposed new residences are not planned to have basements. Finally, we have assumed that the proposed development will be constructed in accordance with the provisions of the 2021 International Building Code (IBC) as well as any jurisdictional code requirements.

SCOPE OF SERVICES

The purpose of our services was to explore the site surface and subsurface conditions in order to provide preliminary geotechnical recommendations for the proposed development. The following describes our specific scope of services:

- **Geologic Map Review**: We reviewed relevant available geologic maps of the site for information regarding geologic conditions and hazards at or near the site.
- **Subsurface Explorations**: We excavated 2 additional test pits (TP-5 and TP-6), to depths ranging between 8 to 9.5 feet below existing ground surface (bgs) across the existing lot to the far east, at the locations shown on Figure 2. This is in addition to our previously completed work, where we excavated a total of 4 test pits (TP-1 through TP-4) at the locations shown on Figure 2. Soil samples were collected from the major strata encountered in each test pit.
- **Infiltration Testing:** We previously performed infiltration testing at the location of the proposed stormwater detention facility, at a depth determined by the Geotechnical Engineer in the field. Infiltration testing was attempted at the location of IT-1 at a depth of 5.5 feet in the silty sand with gravel layer.
- **Laboratory Testing:** All samples were returned to our office and select samples were subjected to additional laboratory testing, that included: in-situ moisture content and fines content testing.
- **Engineering Analyses:** All data collected during the subsurface exploration, literature research, and laboratory testing was evaluated and used to develop geotechnical design and construction recommendations.
- **Geotechnical Engineering Evaluation:** This document summarizes our geotechnical services, and includes:
  - A site vicinity map and site plan showing the approximate locations of our explorations.
  - A discussion of subsurface conditions encountered including pertinent soil and rock properties as well as the encountered groundwater conditions.
  - Geotechnical related recommendations for foundation design including allowable bearing capacity and estimated settlements.
  - Seismic design parameters in accordance with ASCE 7-16.

- Structural fill recommendations, including an evaluation of whether the in-situ soils can be used as structural fill.
- Floor slab support recommendations.
- General retaining wall design parameter recommendations, including earth pressures, backfill, and drainage.
- Flexible and rigid pavement design recommendations.
- General comments regarding site grading and drainage.
- Discussions on other geotechnical issues that may impact the project.

SITE CONDITIONS

Surface Description

The proposed development is a combined 14.74-acre lot, located at 22111, 22015, and 22007 NE 28th Street, Camas, Clark County, Washington; Clark County Parcel numbers 173177000, 173210000, and 173169000, respectively. The site is bound to the north by NE 28th Street, to the west by a similarly rural single-family residence, and to the east by Phase 1 of the Landing at Green Mountain development, also owned by PLH. The parcel to the south is maintained as an open park space by Clark County Parks.

As mentioned above, the combined property of interest consists of three separate lots, all currently developed with single family residences and all associated utilities. Generally, all existing development is located within the northern portion of the parcels, closer to NE 28th Street. The central and eastern lots have gravel driveways and several outbuildings south of the residences; the western lot has an asphalt-paved driveway and does not have any additional structures. It is our understanding that the existing single-family residence and outbuildings on the central lot will remain, in addition to approximately an acre of pasture south of the outbuildings. We understand that the remaining structures on the east and west parcels are currently planned to be demolished to make way for the new development.

The central and eastern lots are generally maintained as fenced pasture, with some mature evergreen and deciduous trees surrounding the existing residences, along the fence lines, and concentrated at the southern extents of the lots. The northern quarter of the western lot is generally used as storage for fence debris and associated equipment for a fencing contractor operating out of the property, in addition to the existing residence. The central half of the western lot is partially within a wetlands area mapped by the National Wetlands Inventory (NWI), and as such, there is extensive standing water across the ground surface of the central half of this lot. The vegetation in this area is characteristic of wetland plants and mostly consists of dense, tall reeds and mature aspen trees. The southern extent of the western lot is heavily forested with mature evergreen and deciduous trees and low undergrowth.

In terms of topography, the northeastern corner of the property is located at approximately 280 feet AMSL (above median sea level), and the site descends at a gentle 0 to 10 percent gradient to the

southwestern corner of the property, which is located at 222 feet AMSL. Overall, the slope descending from northeast to southwest across the development area is very gentle and consistent, with very few areas that may be considered locally flatter and/or steeper.

Geologic Setting

The map area lies on the eastern margin of the Portland Basin, which is part of the Puget-Willamette Lowland that separates the Cascade Range from the Oregon Coast Range. Since the late Eocene era, the Cascade Range has been the locus of an episodically active volcanic arc associated with underthrusting of oceanic lithosphere beneath the North American continent along the Cascadia Subduction Zone.

The underlying geologic unit at the subject property is mapped by the Washington Geologic Information Portal as "QTc – Quaternary-Tertiary continental sedimentary rocks and deposits – conglomerate with sandy and silty facies. Quaternary-Miocene pebble, cobble, and boulder gravel. Pleistocene-Pliocene gravel, sand, silt, and clay; deposits of the ancestral Columbia River."

According to the USDA Soil Survey, there are a number of surficial soils mapped at the site. Within the eastern lot, there are three mapped soils, which include: Lauren gravelly loam (LgB), 0 to 8 percent slopes, Lauren loam (LeB), 0 to 8 percent slopes, and McBee silt loam (MlA), coarse variant, 0 to 3 percent slopes. The Lauren series is considered to be well drained, with moderately high to high permeability, while the McBee series is a poorly drained, hydric soil, which have shallow depths to the water table and experience regular or extended flooding or ponding.

Subsurface Conditions

On December 16, 2024, we visited the site to excavate four exploratory test pits (TP-1 through TP-4), as part of our preliminary evaluation of the site. On March 21, 2025 we returned to excavate two additional test pits (TP-5 and TP-6). In all, we excavated a total of 6 test pits to depths ranging between 4.5 and 10 feet below existing ground surface (bgs) across the proposed development area. Soil samples were collected from the major strata encountered in each test pit and at the bottom of the infiltration test location, and were returned to our office for examination and index testing. See Figure 2 - Site & Exploration Plan for the locations of our explorations. Descriptions of field and lab procedures and the exploration logs are included in Appendix A. The following is a highly generalized description of the subsurface units encountered:

Native SILT

At the ground surface of all explorations, we encountered various soft, fine-grained soils, ranging from silt with varying amounts of clay at TP-1, TP-3 TP-4, TP-5 and TP-6 to highly organic clay at TP-2. These soft surficial soils extended to depths ranging between 1 to 5 feet bgs. Laboratory tests conducted on soil samples retrieved from this layer returned moisture contents ranging from 24 to 39 percent.

Native Sandy CLAY and Silty CLAY with Sand

Underlying the surficial silt at TP-2, TP-4 and TP-5, we encountered soft to medium stiff Sandy CLAY, which extended to depths of about 5 and 6.5 feet bgs, respectively. Laboratory testing conducted on samples retrieved from this layer returned a moisture content of 31 to 36 percent, and a fines content of 52 to 68 percent.

Native Silty SAND and GRAVEL

Underlying the sandy clay at TP-2 and TP-5 and the surficial silt at TP-1, TP- 3 and TP-6, we encountered dense Silty SAND and dense Silty GRAVEL, extending to depths of 8.5 and 7.5 feet bgs, respectively. Laboratory testing conducted on samples retrieved from this layer returned moisture contents ranging from 29 to 45 percent, and fines content ranging between 30 to 56 percent.

Weathered BEDROCK

Underlying the Silty SAND in and the Silty GRAVEL TP-3, TP-5 and TP-6, and underlying the Silty CLAY in TP-2, we encountered very dense Clayey SAND and GRAVEL with Clay, which we interpreted to be weathered bedrock. This layer extended to the termination depths of both explorations. Laboratory testing conducted on samples retrieved from this layer returned moisture contents ranging from 33 to 54 percent.

Groundwater

Groundwater was encountered in all our explorations except TP-6 at depths ranging from about 2 to 3.5 feet bgs. TP-1, TP-2, TP-4, TP-5 were excavated within or very near to the mapped hydric soils in the west and central areas of the site, TP-3 was excavated in non-hydric soils. Data published on Clark County MapsOnline indicates that overall, groundwater at the site is located between 0 to 20 feet bgs, which corresponds to the groundwater conditions observed during our explorations.

Depending on the time of year of construction, it may be possible that groundwater could be an issue during shallow foundation construction.Utility trenches may encounter perched water during construction, requiring the use of shoring and dewatering methods. Due to the shallow groundwater and hydric soils across the site, infiltration of stormwater is likely not feasible. Groundwater elevations can fluctuate depending on the time of year of construction and changes in land use.

Geologic Hazards Review

The following provides a geologic hazards review for the subject site in accordance with CCC 40.430. The geologic hazard review is based on our site reconnaissance and explorations, as well as a review of publicly available published literature and maps.

Mapped Hazards: As a part of our due diligence, we reviewed the Clark County Property Information Center - MapsOnline website (https://gis.clark.wa.gov/gis/property) for information on geologic

hazards present at this property. No geologic hazards are mapped on this property. The site is mapped as having an NEHRP site class C and very low liquefaction susceptibility. We address the applicable sections of CCC 40.430 below:

Liquefaction: As stated above, the area to be developed is mapped as having a very low liquefaction susceptibility. This corresponds to the conditions observed in our explorations where dense soils with a significant coarse material percentage (eg, sand, gravel, cobbles, or boulders) were encountered at relatively shallow depths ranging between 4.5 and 7 feet bgs. Dense, large-grained soils below the water table (encountered at 5 feet bgs at the shallowest) have a very low potential for liquefaction.

Ground Motion Amplification: In accordance with ASCE 7-16, we recommend a Site Class C (dense soil and soft rock soil profile with an average N-value greater than 50) for this site when considering the average of the upper 100 feet of bearing material beneath the foundations. This recommendation is based on the results of our subsurface investigation as well as our understanding of the local geology.

Inputting our recommended Site Class as well as the site latitude and longitude into the ACSE 7 website (ASCE 7 Hazard Tool), we obtained the seismic design parameters shown in Table 1 below. Note that the values for F_a and F_v in Table 2 were obtained from ASCE's Supplement 3 dated November 5, 2021 and issued for ASCE 7-16 to correct some seismic design issues in the original publication.

Table 1. 2021 IBC (ASCE 7-16, Supplement 3) Seismic Design Parameters

Location	Short Period	1-Second
Maximum Credible Earthquake Spectral Acceleration	S_s = 0.794 g	S_1 = 0.350 g
Site Class	C	
Site Coefficient	F_a = 1.2	F_v= 1.5
Adjusted Spectral Acceleration	S_{MS} = 0.953 g	S_{M1} = 0.525 g*
Design Spectral Response Acceleration Parameters	S_{DS} = 0.635 g	S_{D1} = 0.350 g
MCE_G Peak Ground Acceleration	MCE_G PGA = 0.355 g	
Site Amplification Factor at PGA	F_{PGA} = 1.2	
Site Modified Peak Ground Acceleration	PGA_M = 0.427 g	

g – acceleration due to gravity, * See note below.

The return interval for the ground motions reported in the table above is 2 percent probability of exceedance in 50 years.

Infiltration Testing

We attempted infiltration testing at the location of the proposed infiltration facility, at a depth of approximately 5.5 feet bgs. No reliable data was collected over the course of the test, due to the presence of surface water and potential shallow groundwater.

Based on this and the presence of shallow groundwater at most of our other explorations, as well as the presence of hydric soil indicators across the site, it is our opinion that infiltration is not a feasible method of stormwater management at this site.

CONCLUSIONS AND RECOMMENDATIONS

Geotechnical Design and Construction Considerations

Based on the results of our Preliminary Geotechnical Engineering Evaluation, development of the site with the proposed development is feasible provided the recommendations in this report are included in the project design and implemented during construction. Again, this is a preliminary geotechnical investigation meant to create a “broad brush” understanding of the subsurface conditions across the site. We recommend lot-specific geotechnical explorations and recommendations if more detailed information is required/recommended.

The primary geotechnical concerns associated with the project are:

1. **Presence of soft surficial soils.** As noted above, we encountered variable depths of soft surficial soils across the site, ranging in thickness from 1 to 5 feet below existing ground surface (bgs). During mass grading we expect much of the surficial soils will be removed from the site or stockpiled for later use in landscape areas. Once the subgrade has been approved by True North, mass grading may begin using suitable onsite material or imported structural/engineered fill. We expect that foundations will generally bear on properly placed and compacted structural/engineer fill.

2. **Presence of shallow groundwater and surficial water.** As stated above, we encountered groundwater at nearly all test pit locations over the course of our explorations. TP-1, TP-2, TP-4, and TP-5 were excavated within or very near to mapped hydric soils, and TP-2 was excavated just north of mapped NWI wetlands area, in a location with an excess of surficial water. It is also possible that the standing water at the ground surface may be an issue for mass grading and shallow foundation construction, and the contractor may need to take steps to dewater much of the western lot before beginning grading activities, depending on the time of year.

   Additionally, utility trenches and other embedded structure excavations will likely encounter groundwater during development of the site. The contractor will need to be prepared for this condition.

As discussed previously, based on this and the presence of shallow groundwater at most of our explorations, as well as the presence of hydric soil indicators across the site, it is our opinion that infiltration is not a feasible method of stormwater management at this site.

In summary, provided the recommendations in this report are adhered to, we do not foresee any major issues that would preclude the proposed development. The above-mentioned factors are listed to draw the attention of the reader to the issues to address during design and construction.

Moisture Sensitive Soils/Weather Related Concerns

The fine-grained soils at this site are considered moisture sensitive. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

Given the depth of the soft surficial soils encountered across this site, the contractor may need to consider the construction of temporary haul roads depending on the time of year construction takes place. True North can provide more detailed wet weather recommendations if needed. Stormwater should not be allowed to collect on prepared subgrades.

Site Preparation

Site preparation will include clearing, grubbing, etc. to remove the soft upper organic soils to expose the underlying, native, medium-stiff sandy/silty clay. Once the stripping has been approved we recommend proofrolling the site with a fully loaded, tandem axle dump truck to identify any excessively soft spots under the observation of the Geotechnical Engineer during various phases of construction to ensure proper fill placement. Areas not able to be adequately proofrolled (or where not practical) will be evaluated by the Geotechnical Engineer using a ½-inch diameter steel probe rod. Any soft spots identified should be over excavated to expose firm and unyielding soils and replaced with compacted structural fill.

Any utilities present beneath the proposed construction will need to be located and rerouted as necessary and any abandoned pipes or utility conduits should be removed to inhibit the potential for subsurface erosion. Utility trench excavations should be backfilled with properly compacted structural fill in accordance with the structural fill recommendations in this report.

It should be noted that, due to the soft surficial soils observed in the west of the site, construction traffic on these upper soils may have a difficult time moving around on site. We recommend consideration be given to constructing haul roads depending on site conditions at the time of construction.

Subgrade Verification

Following site preparation as described above and compaction of the exposed subgrade prior to placing aggregate base for the foundations, building pad, or pavement section, the exposed subgrade should be evaluated. Subgrades should be evaluated by qualified True North personnel using a steel foundation probe or proofrolling. Unsuitable areas identified during the evaluation should be re-compacted or be excavated and replaced with imported granular structural fill.

Excavations

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document and subsequent updates were issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

Depending on the time of year, and the depth of the excavation, groundwater may be encountered at shallow depths. If groundwater is encountered during excavation, the soils encountered in our subsurface explorations should be classified as Type C soil according to the most recent OSHA regulations. If groundwater is not encountered or dewatering is accomplished in advance of excavation, the soils may be classified as Type B soil. In our opinion, excavations should be safely sloped or shored.

If groundwater is encountered during excavation, positive groundwater control will be required, including the possibility of wells extending below the depth of excavation. Groundwater levels will be lowest in the dry season, and construction during that time will minimize groundwater control problems. The groundwater conditions at the time of construction and the contractor’s ability to control these conditions will control the degree of inclination of temporary slopes. In our opinion, temporary excavation slopes can be constructed as steep as 1.5H:1V, if groundwater levels are maintained at least 2 feet below the bottom of the excavation. Slopes should be flattened if significant seepage or running soils are encountered.

If slopes of this inclination, or flatter, cannot be constructed, or if excavations greater than four feet in depth are required, temporary shoring may be necessary. This shoring would help protect against slope or excavation collapse and would provide protection to workmen in the excavation.

We are providing this information solely as a service to our client. True North does not assume responsibility for construction site safety or the contractor's compliance with local, state, and federal safety or other regulations.

Construction Dewatering

The results of our subsurface investigations indicate that the groundwater seepage at the site is located some 1 to 5 feet below the ground surface, and will fluctuate in response to seasonal precipitation. Excavations that extend below the groundwater level may result in caving, heaving, or running soils, especially if excavations extend into the sandy clay soils encountered in our explorations. The contractor should consider the use of a network of ditches and sumps, into which water can flow to be pumped out of the excavation.

The depth and dewatering time will need to be determined at the time of construction and adjusted depending on site conditions. Unprotected working should not be allowed near temporary un-shored excavations until groundwater levels have been stabilized and shoring, such as trench shields or bracing, has been installed.

Structural Fill

Structural fill should be granular, free of organics or other deleterious materials, have a maximum particle size less than 3 inches, be relatively well graded, and have a liquid limit less than 45 and plasticity index less than 25. In our professional opinion, we anticipate the surficial fine-grained soils stripped from this site may be used only in landscape areas. These soils are moisture sensitive and could be difficult (depending on time of year of construction) to properly moisture condition and place. As such, the contractor will need to account for the need to import material to raise site grades. We recommend crushed rock structural fill be placed beneath footings, slabs, or other structural elements to allow for uniform load distribution, to provide protection from the elements, and to create a clean working surface.

We recommend all structural fill be moisture conditioned to within 3 percentage points below and 2 percentage points above optimum moisture as determined by ASTM D1557 (modified proctor). If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying.

Fill should be placed in relatively uniform horizontal lifts on the prepared subgrade which has been stripped of deleterious materials (i.e. topsoil and fill) and approved by the Geotechnical Engineer or his representative. Each loose lift should be about 1-foot thick. The type of compaction equipment used will ultimately determine the maximum lift thickness. Structural fill should be compacted to at

least 95 percent of modified proctor maximum dry density as determined by ASTM D1557. Each lift of compacted engineered fill should be tested by a representative of the Geotechnical Engineer prior to placement of subsequent lifts.

Utility Trench Backfill

Trench backfill for the utility pipe base and pipe zone should consist of well-graded granular material with a maximum particle size of ¾ inch and less than 8 percent by weight passing the U.S. Standard No. 200 Sieve. The material should be free of roots, organic matter, and other unsuitable materials.

Trench backfill should be compacted to at least 90 percent of the maximum dry density at depths greater than 4 feet below finished grade and to 95 percent of the maximum dry density within 4 feet of finished grade. Compaction is based on ASTM D1557/AASHTO T-180, the modified proctor test, or as recommended by the pipe manufacturer.

Foundation Recommendations

Once the site has been properly prepared as discussed above, the planned construction can be supported on a conventional shallow foundation system. All foundations should bear on native, undisturbed, medium stiff silty/sandy clay, or atop compacted granular crushed rock structural fill placed atop the approved subgrade soils. Spread footings for building columns and continuous footings for bearing walls supported on the above-mentioned materials can be designed for an allowable soil bearing pressure of 2,000 psf based on dead load plus design live load and can be increased by one-third when including short-term wind or seismic loads. The above allowable soil bearing pressures can be increased by one-third when including short-term wind or seismic loads. Construction shall be accomplished in accordance with the 2021 International Building Code (IBC).

Lateral frictional resistance between the base of footings and the subgrade can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.33 for concrete foundations bearing directly on the subgrade soils described above or on compacted structural fill placed atop that strata. In addition, lateral loads may be resisted by passive earth pressures based on an equivalent fluid pressure of 250 pounds per cubic foot (pcf) for footings poured “neat” against the above-mentioned soil/rock strata. These are ultimate values—we recommend a factor of safety of 1.5 be applied to the equivalent fluid pressure, which is appropriate due to the amount of movement required to develop full passive resistance.

Exterior footings and foundations in unheated areas should be located at a depth of at least 18 inches below the final exterior grade to provide adequate frost protection. If the construction takes place during the winter months and the foundation soils will likely be subjected to freezing temperatures after foundation construction, then the foundation soils should be adequately protected from freezing. Otherwise, interior foundations can be located at nominal depths compatible with architectural and structural considerations.

The foundation excavations should be observed by a representative of the Geotechnical Engineer prior to steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Unsuitable soil zones encountered at the bottom of the foundation excavations should be removed and replaced with properly compacted structural fill as directed by the Geotechnical Engineer.

The fine-grained soils at this site are moisture sensitive. As such, they should be kept to as close to their in-situ moisture content. This should be accomplished during construction by covering the soil subgrade the same day it is exposed with crushed rock structural fill. Surface run-off water should be drained away from the excavations and not be allowed to pond.

Based on the known subsurface conditions we anticipate that properly designed and constructed foundations supported on the above-mentioned materials could experience maximum total settlement on the order of 1-inch and differential settlement on the order of 1/2-inch over 30 horizontal feet.

Granular Pads: Granular pads should be used if unsuitable foundation conditions are encountered at the proposed foundation subgrade elevations. Granular pads should extend 6 inches horizontally beyond the margins of the footings for each foot of the pad thickness or to the depth of firm, undisturbed native soil. The granular pads should be a minimum of 6 inches thick, however if embedded structures are encountered in the foundation areas, the embedded structure should be removed down to a minimum 24-inches below the base of footing, and granular pads should be thickened accordingly.

The granular pads should consist of ¾-inch minus crushed rock that is fairly well graded between coarse and fine, contains no organic matter or other deleterious materials, and has less than 5 percent passing the U.S. Standard No. 200 Sieve. The imported crushed rock should be compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D 698.

Retaining Walls

We were not provided any construction drawings that would indicate if site retaining walls are necessary to complete the grading of the site. True North is available to provide a separate retaining wall design for any planned walls. We provide the following recommendations for use by the Structural Engineer in the event additional stem walls or other concrete structural walls are required for the homes.

The foundations for the proposed walls should be designed in accordance with foundation recommendations above. Lateral earth pressures on walls, which are not restrained at the top, may be calculated on the basis of an “active” equivalent fluid pressure of 40 pcf for level backfill, and 60 pcf for sloping backfill with a maximum 2H:1V slope. Lateral earth pressures on walls that are restrained from yielding at the top (i.e. stem walls) may be calculated on the basis of an “at-rest”

equivalent fluid pressure of 60 pcf for level backfill, and 90 pcf for sloping backfill with a maximum 2H:1V slope. The stated equivalent fluid pressures do not include surcharges, such as foundation, vehicle, equipment, etc., behind walls, hydrostatic pressure buildup, or earthquake loading.

For seismic loading on retaining walls with level backfill, new research indicates that the seismic load is to be applied at 1/3 H of the wall instead of 2/3 H, where H is the height of the wall. We recommend that a Mononobe-Okabe earthquake thrust per linear foot of 4.8 psf* H^2 be applied at 1/3 H, where H is the height of the wall measured in feet. For a maximum 2H:1V slope we recommend 6.6 psf*H^2. This assumes a combination of soil and granular backfill retained by the walls within the active wedge.

All backfill for retaining walls should be select granular material, such as sand or crushed rock with a maximum particle size between ¾ and 1 ½ inches, having less than 5 percent material passing the No. 200 sieve. Because of their silt content, the native soils do not meet this requirement, and it will be necessary to import material to the project for wall backfill. Silty soils can be used for the last 18 to 24 inches of backfill, thus acting as a seal to the granular backfill. All backfill behind retaining walls should be moisture conditioned to within ± 2 percent of optimum moisture content and compacted to a minimum of 90 percent of the material's maximum dry density as determined in accordance with ASTM D1557. Fill materials should be placed in layers that, when compacted, do not exceed about 8 inches. Care in the placement and compaction of fill behind retaining walls must be taken in order to ensure that undue lateral loads are not placed on the walls. An adequate subsurface drain system will need to be installed behind retaining walls to prevent hydrostatic buildup.

Slab-on-grade Floors

Support for lightly loaded floor slabs can be obtained on the undisturbed native soil or on engineered structural fill. A minimum 4-inch-thick layer of imported granular material should be placed and compacted over the prepared subgrade to assist as a capillary break and provide uniform load distribution.

A subgrade modulus of 150 pounds per cubic inch may be used to design floor slabs. Imported granular material should be crushed rock or crushed gravel and sand that is well-graded between coarse and fine, contain no deleterious materials, have a maximum particle size of 1½ inches, and have less than 5% by weight passing the U.S. Standard No. 200 Sieve. The imported granular material may be placed in one lift and should be compacted until well-keyed, about 95% of the maximum dry density as determined by ASTM D1557 (AASHTO T-180).

Pavement Recommendations

The following pavement recommendations are presented as preliminary for your consideration. We assume the roads which are to run through the development connecting N 82nd Avenue to the east and NE 28th Street to the north are classified by the City of Camas as “Local Streets”. These roads serve to distribute traffic from collectors and provide direct access for abutting properties. The City of Camas street construction details specify a minimum pavement thickness of 4 inches overlying

2 inches of crushed rock top course overlying 9 inches of crushed rock base course.

Below, we performed a preliminary analysis of the minimum design pavement section for the road noted above based on assumed traffic loading which includes residential traffic, through trips, and regular and miscellaneous heavy-vehicle traffic. The Civil Engineer for the project may have more traffic and project design data available than is presently known as well as more information regarding the County classification of the road noted above and may wish to modify and/or refine our pavement section thickness recommendations. We are available, upon request, to provide a more detailed pavement design if more definitive traffic information is available.

For analysis of the asphaltic concrete pavement section thickness design recommendations, we have assumed the following design parameters: a design life of approximately 20 years, a Terminal Serviceability Index (P_t) of 2 (i.e. poor condition), and a Regional Factor (R) of 3. We assumed an average of 1,184 trips of a passenger car in and out of the neighborhood per day (684 trips generated by residents and 500 miscellaneous through trips). We also assumed miscellaneous heavier traffic such as garbage trucks, school buses, and delivery vans/trucks. This assumed traffic loading results in 388 equivalent 18,000 pound equivalent single axle loads per day (ESALs). Additionally, we used an assumed CBR value of 3 for the existing medium stiff fine grained clayey soils. These parameters result in a required Structural Number of 3.03 for the new road. Based on these parameters, find that the standard pavement section consisting of 4 inches of Asphalt Concrete over 11 inches of aggregate base is anticipated to be sufficient for the local streets within the planned new subdivision and meets the City of Camas Engineering Standards for a two-lane Local Street, as outlined in the City of Camas Design Standards, Standard Detail ST2. Again, we are available to modify our recommendation if provided with more detailed pavement design traffic loadings and/or route classification.

We recommend the subgrade be proofrolled with a fully loaded tandem axle dump truck dump truck to confirm adequate subgrade conditions. It is possible that there will be areas that are observed to yield that will require correction prior to pavement construction (i.e. ripping wet subgrade soils with the teeth of a dozer to dry them out, and/or re-compacting soils that are soft).

We recommend the placement of a woven geotextile fabric (Mirafi HP270 or equivalent) over the native soil subgrade after it has been prepared and approved, to reduce the risk of contaminating the base course with the native fine-grained soil. Asphalt pavement base course material should consist of a well-graded 1½-inch or ¾-inch-minus crushed rock having less than 5 percent material passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the State of Washington, Standard Specifications for Highway Construction. Base course material should be moisture conditioned to within ± 2 percent of optimum moisture content, and compacted to a minimum of 95 percent of the material's maximum dry density as determined in accordance with ASTM D1557 (Modified Proctor). Fill materials should be placed in layers that, when compacted, do not exceed about 8 inches. Asphaltic

concrete material should be compacted to at least 91 percent of the material's theoretical maximum density as determined in accordance ASTM D2041 (Rice Specific Gravity).

In order to achieve the assumed 20 year design life, pavement requires regular maintenance to protect the underlying subgrade from being damaged. The primary concern is subgrade saturation which can cause it to weaken. Proper site drainage should be maintained to protect pavement areas. In addition, cracks that develop in the pavement should be sealed on a regular basis.

Drainage: Permanent, properly installed drainage is also an essential aspect of pavement design and construction. All paved areas should have positive drainage to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as around stormwater catch basins. Effective means to prevent saturation of the base course including installing weep holes in the sidewalls to catch basins.

Geotextile Separation Fabric: A geotextile separation fabric will be required at the interface of the native soil and imported subgrade material beneath the proposed roadways. The separation fabric should meet the specificiation provided in WSS 9-33.2(1) – Geotextile Properties (Table 3) for soil separation. The geotextile should be installed in conformance with the specifications provided in WSS 2-12 – Construction Geosynthetic.

Stabilization Material: In the case of unsuitable or unstable pavement subgrade conditions, stabilization material consisting of pit- or quarry-run rock or crushed rock should be placed below the above-described pavement sections. The material should have a maximum particle size of 6-inches and less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve, have at least two mechanically fractured faces, and be free or organic matter or other deleterious material. Material meeting the specification provided in WSS 9-27.3(6) – Stone is generally acceptable for use. Stabilization material should be placed in lifts between 12 and 18 inches thick and compacted to a firm condition with a smooth-drum roller without using vibratory action.

Drainage and Groundwater Considerations

The Contractor should be made responsible for temporary drainage of surface water and groundwater as necessary during construction to prevent standing water and/or erosion at the site.

As a matter of good construction practice, we recommend that perimeter drains be installed for all buildings. Perimeter drains should consist of perforated drainpipe embedded in a zone of free draining fill that is wrapped in a non-woven geotextile filter. The pipe should be connected to a tightline drainpipe leading to storm drain facilities. Foundation and crawl space drainage should be sloped to drain to a sump or low point drain outlet. Water should not be allowed to pond within crawl spaces. Roof drains should be connected to a tightline drainpipe leading to storm drain outlet facilities.

Water should not be allowed to collect in the foundation excavations or on prepared subgrades for the foundations/slabs/roadway during construction. Positive site drainage should be maintained throughout construction activities. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, groundwater, or surface runoff.

The site grading plan should be developed to provide rapid drainage of surface water away from the building areas and to inhibit infiltration of surface water around the perimeter of the buildings and beneath the floor slabs. The grades should be sloped away from the building area. We anticipate stormwater will be routed to a stormwater management system to be constructed as part of this development.

Soil Erosion

Site-specific erosion control measures should be implemented to address the maintenance of slopes or exposed areas. This may include silt fence, bio-filter bags, straw wattles, or other suitable methods. During construction, all exposed areas should be well compacted and protected from erosion. Temporary slopes or exposed areas may be covered with straw, crushed aggregate, or rip in localized areas to minimize erosion.

CONSTRUCTION OBSERVATIONS

Satisfactory earthwork performance depends on the quality of construction. Sufficient monitoring of the contractor's activities is a key part ensuring that work is completed in accordance with the construction drawings and specifications. We recommend that True North observe that the subsurface conditions observed during our site investigation are consistent with those encountered during construction, and that foundation subgrades are suitable for placement of structural fill, rebar, or concrete for the new structures. True North cannot accept any responsibility for any conditions that deviate from those described in this report, nor for the performance of the foundations if not engaged to also provide construction observation for this project.

The City of Camas will require a final letter of geotechnical compliance before they finalize a permit. If such a letter is required, a representative from True North MUST observe foundation subgrades PRIOR to concrete being poured for the foundation. If True North does not perform this observation, we cannot provide a final letter of geotechnical compliance, and a permit will not be eligible for final sign-off. It is the owner's responsibility to ensure that True North be notified in a timely manner (i.e., at least 48 hours prior to the required observation) of the need for our services during construction.

LIMITATIONS

This report was prepared for the exclusive use of Pacific Lifestyle Homes and members of the design team for specific application to the Landing at Green Mountain Phase 2 development located at the address noted above. It should be made available to prospective contractors for information on the factual data only, and not as a warranty of subsurface conditions such as those interpreted

from the explorations and presented in the discussions of the subsurface conditions included in this report.

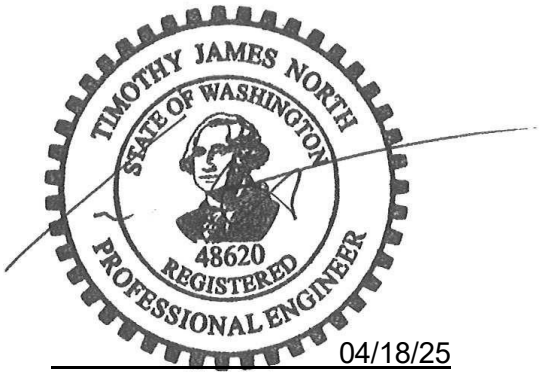
The recommendations contained in this report are based on information derived through subsurface sampling. No matter how effective subsurface sampling may be, variations between exploration location and the presence of unsuitable materials are possible and cannot be determined until exposed during construction. Accordingly, True North's recommendations can be finalized only through True North's observation of the project's earthwork construction. True North accepts no responsibility or liability for any party's reliance on True North's preliminary recommendations.

Within the limitations of the scope, schedule and budget, the analyses, conclusions, and recommendations presented in this report were prepared in accordance with generally accepted professional geotechnical engineering principles and practice in this area at the time this report was prepared. We make no warranty, either express or implied.

CLOSING

We appreciate the opportunity to be of service to you. If you have any questions, or if we can be of further assistance to you, please contact us at (360) 984-6584.

Respectfully Submitted,



04/18/25

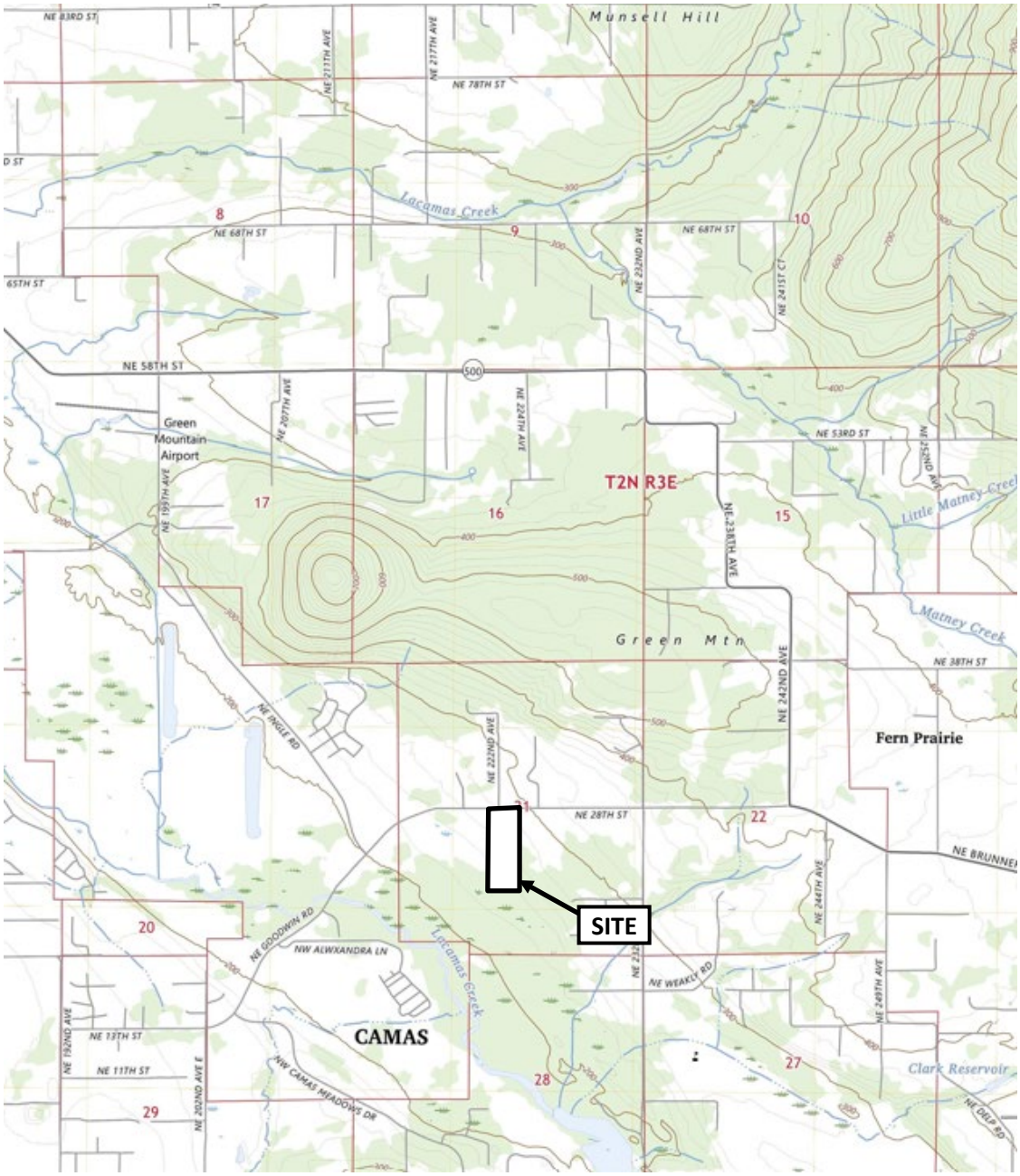
Timothy J. North, P.E.
Principal Geotechnical Engineer

Reviewed By:

Lauren Shepherd, E.I.T.
Staff Geotechnical Engineer

Attachment: Figure 1 – Site Vicinity
Figure 2 – Site Layout and Explorations
Figure 3 – Site Photographs
Appendix A – Field Exploration Methods, Lab Testing Procedures, Exploration Logs

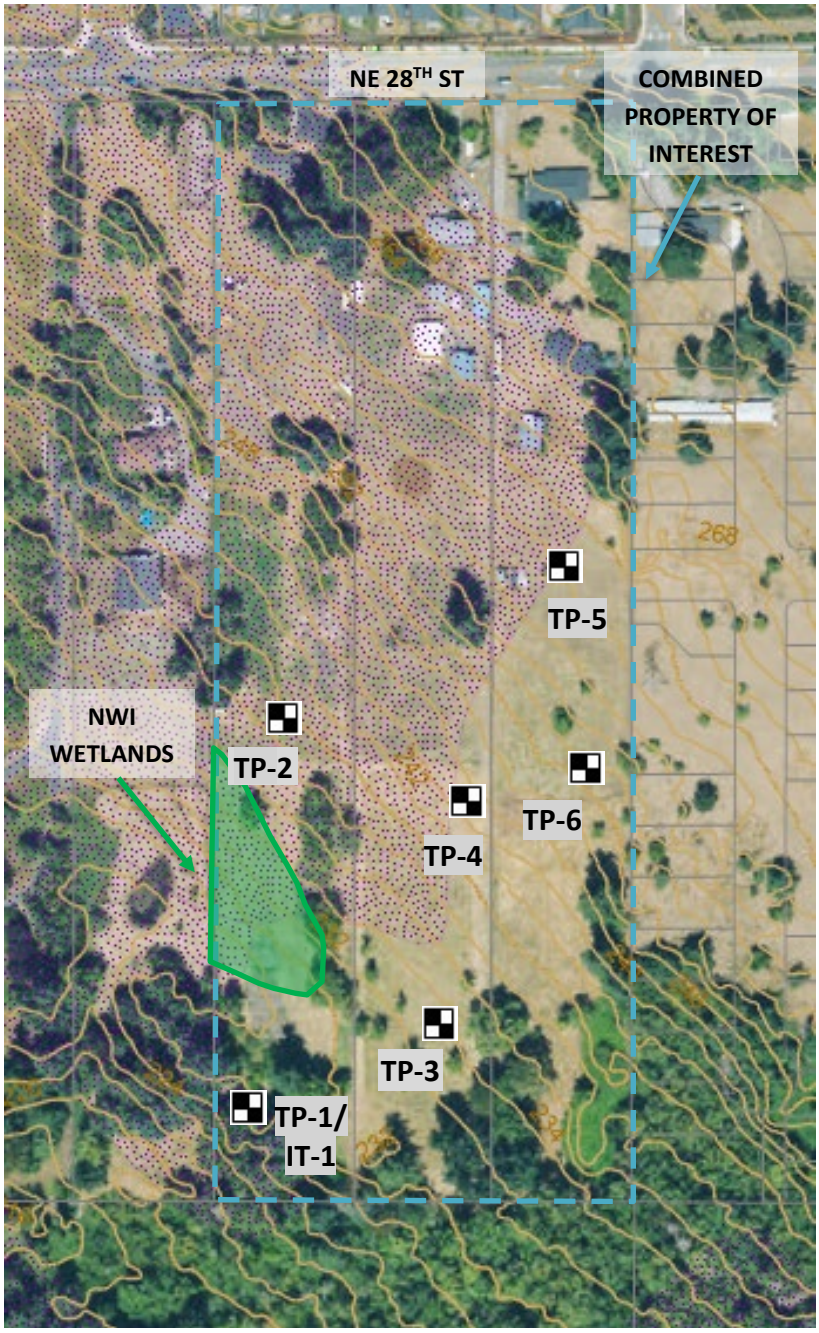
FIGURES



Not to Scale

Source: "Topographic Map of the Lacamas Creek Quadrangle, 7.5 minute series" 2023, United States Geological Survey (USGS).

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 1 – Vicinity Map



Scale:
1" ≈ 200'

TP-1 Approximate Exploratory Test Pit Locations, December 16, 2024, and March 21, 2025.

Note: Purple shading indicates hydric soils.

Source: Aerial & Topo – Clark County MapsOnline, accessed January 6, 2025.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	March 2025	Figure 2 – Site & Exploration Plan



Photo 1. From the approximate location of TP-2, looking south at the location of TP-1



Photo 2. From the approximate location of TP-2, looking east across the combined properties

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3A – Site Photographs (1 of 4)



Photo 3. From the approximate center of the eastern lot, looking southwest



Photo 4. From the approximate center of the center lot, looking north at the existing structures on the lots.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3B – Site Photographs (2 of 4)



Photo 1. TP-6 in progress, looking northwest



Photo 2. TP-6 in progress, looking west

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3C – Site Photographs (3 of 4)



Photo 3. TP-5 in progress, looking southeast



Photo 4. Existing structures on the eastern lot, looking north.

TRUE NORTH GEOTECHNICAL	Pacific Lifestyle Homes Landing at Green Mountain Ph 2 Camas, Washington	Project # 24-0431-2
219 West 4th Street Vancouver, WA 98660 360-984-6584	April 2025	Figure 3D – Site Photographs (4 of 4)

APPENDIX A

Field Exploration Procedures
Laboratory Testing Procedures
Test Pit Logs

FIELD EXPLORATION PROCEDURES

General

We excavated a total of 26test pits (TP-1 and TP-6) to depths ranging between 8 and 10 feet below existing ground surface (bgs) across the proposed development area. The excavations were advanced utilizing a Link-Belt 80 X3 with a 30-inch wide toothed bucket subcontracted from Thompson Brothers Excavating. Soil samples were collected from the major strata encountered in each test pit and at the bottom of each infiltration test pit location The approximate exploration locations are shown in Figure 2.

Soil Sampling

Representative grab samples of the soil observed in the explorations were obtained from the sidewalls or spoils. Samples obtained in the exploration were sealed in airtight, plastic bags to retain moisture and returned to our laboratory for additional examination and testing. The test explorations were loosely backfilled.

Pocket Penetrometer Testing

The undrained shear strength of fine-grained soil (silt and clay) was estimated with a pocket penetrometer applied to the sidewalls of the test pits. A pocket penetrometer is a hand-held device that indicates undrained compressive strength in tons per square foot. The test method is approximate and applicable only to fine-grained soil.

Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, peculiar odors, and other distinguishing characteristics of the soil samples were noted. The terminology used is described in the key and glossary that follow.

Summary Exploration Logs

Results from the explorations are shown in the summary exploration logs. The left-hand portion of a log provides our interpretation of the soil encountered, sample depths, and groundwater information. The right-hand, graphic portion of a log shows the results of pocket penetrometer and laboratory testing. Soil descriptions and interfaces between soil types shown in summary logs are interpretive, and actual transitions may be gradual.

LABORATORY TESTING PROCEDURES

Soil samples obtained during field explorations are examined in our laboratory, and representative samples may be selected for further testing.

Visual-Manual Classification

Soil samples are classified in general accordance with guidelines presented in ASTM D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). The physical characteristics of the samples are noted and the field classifications are modified, where necessary, in accordance with ASTM terminology, though certain terminology that incorporates

current local engineering practice may be used. The term which best described the major portion of the sample is used to describe the soil type.'

Natural Moisture Content

Natural moisture content is determined in general accordance with guidelines presented in ASTM D2216, Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass. The natural moisture content is the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of solid particles.

Fines Content

Fines content testing is performed in general accordance with guidelines presented in ASTM D1140, *Standard Test Methods for Determining the Amount of Material Finer than 75-µm (No.200) Sieve in Soils by Washing*. The fines content is the fraction of soil that passes the U.S. Standard Number 200 Sieve. This sieve differentiates fines (silt and clay) from sand and gravel. Soil material that remains on the Number 200 sieve is sand. Material that passes the sieve is fines. The test is used to refine soil type.

TRUE NORTH
GEOTECHNICAL
219 West 4th Street, Vancouver, WA
360-984-6584 - info@tnorthgeo.com

TABLE A1
Key to Exploration Logs - Terminology and Symbols

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTION
			GRAPHIC	GROUP	
Coarse Grained Soils: More Than 50% Material Retained on No. 200 Sieve	Gravel and Gravelly Soils: More Than 50% Coarse Fraction Retained on No. 4 Sieve	Clean Gravels (Little or No Fines)		GW	Well-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
				GP	Poorly-graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		Gravels with Fines (Significant Percentage of FIne)		GM	Silty Gravels, Gravel-Sand-Silt Mixtures
				GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sand and Sandy Soils: More Than 50% Coarse Fraction Passing No. 4 Sieve	Clean Sands (Little or No Fines)		SW	Well-graded Sands, Gravelly Sands, Little or No Fines
				SP	Poorly-graded Sands, Gravelly Sands, Little or No Fines
		Sands with Fines (Significant Percentage of FIne)		SM	Silty Sands, Sand-Silt Mixtures
				SC	Clayey Sands, Sand-Clay Mixtures
Fine Grained Soils: More Than 50% Material Passing No. 200 Sieve	Silts and Clays	Liquid Limit Less than 50 percent		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty-Clayey Fine Sands, Clayey Silts
				CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays
				OL	Organic Silts and Organic Silty Clays of Low Plasticity
	Silts and Clays	Liquid Limit Greater than 50 percent		MH	Inorganic Silts Micaceous or Diatomaceous Fine Sand or Silty Soils
				CH	Inorganic Clays of High Plasticity, Fat Clays
				OH	Organic Clays of Medium to High Plasticity, Organic Silts
Topsoil				TS	Topsoil, Humus, Duff or Peat (PT) Layers
Fill				F	Highly Variable Constituents
Bedrock				BR	Basalt, Sandstone, Shale, etc.

Relative Density of Coarse-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50+

▼	Observed Groundwater Elevation

Consistency of Fine-Grained Soils	
Relative Density	**N - Blows per Foot**
Very Soft	0 - 2
Soft	2 - 4
Medium Stiff	4 -8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	30 - 50
Very Hard	50+

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-1

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0431-2
Latitude	: 45.63994	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.44693	Logged By	: LS	Project	: Landing at Green Mountain - Phase II
Ground Elevation	: 224 (ft)	Reviewed By	: TJN	Location	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 8 ft BGL	Date	: 12/16/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			CL-ML	Soft, dark brown, SILTY CLAY; rooted to 1 foot bgs; very moist.			0.5	
2	S1				24		0.75	
3							1.75	
▼ 4			CL-ML	As above, but soft to medium stiff, dark brown with red mottling, wet.				
5			SM	Medium dense, gray brown, SILTY SAND WITH GRAVEL; decreasing fines content with depth; wet.				
	S2				31	41		Infiltration testing attempted at 5.5 feet bgs
6	S3				33	30		
7								
	S4				31	36		
				Terminated due to refusal on boulders. Groundwater first encountered at 3.5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

1129

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-2

UTM	: 10T	**Excavator**	: Link-Belt	**Job Number**	: 24-0431-2
Latitude	: 45.64119	**Excavator Supplier**	: Thompson Brothers Excavating	**Client**	: Pacific Lifestyle Homes
Longitude	: -122.44682	**Logged By**	: LS	**Project**	: Landing at Green Mountain - Phase II
Ground Elevation	: 240 (ft)	**Reviewed By**	: TJN	**Location**	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 8 ft BGL	**Date**	: 12/16/2024	**Loc Comment**	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1	S1		OL	Soft, gray, ORGANIC CLAY; wet.	39		0.5	
2 (▼)			SC	Soft to medium stiff, gray brown with red mottling, SANDY CLAY; wet.			0.5	
3							2.5	
4	S2				36	52		
5			SM	Medium dense, brown with red mottling, SILTY SAND; increasingly coarse with depth; wet.			3.75	
6	S3				33	33		
7								
	S4				32			
				Terminated due to refusal on boulders. Groundwater first encountered at 2 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-3

UTM	: 10T	**Excavator**	: Link-Belt	**Job Number**	: 24-0431-2
Latitude	: 45.64000	**Excavator Supplier**	: Thompson Brothers Excavating	**Client**	: Pacific Lifestyle Homes
Longitude	: -122.44616	**Logged By**	: LS	**Project**	: Landing at Green Mountain - Phase II
Ground Elevation	: 234 (ft)	**Reviewed By**	: TJN	**Location**	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 10 ft BGL	**Date**	: 12/16/2024	**Loc Comment**	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Soft, dark brown, SILT, some clay; very moist.				
2			CL-ML	Soft, brown with red mottling, SILTY CLAY WITH SAND; wet.			0.5	
	S1				27		0.5	
▼								
3	S2		SC	Soft to medium stiff, brown with red mottling, SANDY CLAY WITH GRAVEL; wet.	32	56	1.0	
4							3.0	
5								
6								
7			SP	Medium dense, gray with red mottling, POORLY GRADED SAND; increasingly coarse with depth; wet.				
8	S3				37			
9								
	S4				37			
				Groundwater first encountered at 2.5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-4

UTM	: 10T	Excavator	: Link-Belt	Job Number	: 24-0431-2
Latitude	: 45.64097	Excavator Supplier	: Thompson Brothers Excavating	Client	: Pacific Lifestyle Homes
Longitude	: -122.44581	Logged By	: LS	Project	: Landing at Green Mountain - Phase II
Ground Elevation	: 246 (ft)	Reviewed By	: TJN	Location	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 9 ft BGL	Date	: 12/16/2024	Loc Comment	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Soft, dark brown, SILT, some clay; very moist.			0.5	
2				Soft to medium stiff, brown, SILTY CLAY; wet to very moist.			0.5	
3	S1		CL-ML		31	55	1.75	
4							2.25	
5	S2		SP	Gray-brown, POORLY GRADED SAND WITH GRAVEL; medium sized gravel; medium to coarse grained sand; wet.	33			
6								
7								
8	S3				46			
				Groundwater first encountered at 3.5 feet bgs. Test pit backfilled with excavated soils and tamped to grade.				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-5

UTM	: 10T	**Excavator**	: Link-Belt	**Job Number**	: 24-0431-2
Latitude	: 45.64172	**Excavator Supplier**	: Thompson Brothers Excavating	**Client**	: Pacific Lifestyle Homes
Longitude	: -122.44533	**Logged By**	: LS	**Project**	: Landing at Green Mountain - Phase II
Ground Elevation	: 253.58 (ft)	**Reviewed By**	: TJN	**Location**	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 9.5 ft BGL	**Date**	: 03/21/2025	**Loc Comment**	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Soft, dark brown, SILT; heavily rooted to 0.5 feet bgs; moist.				
2			SC	Soft to medium stiff, brown with gray and red mottling, Sandy CLAY; moist to wet.				
3 ▼	S1				35	68		
4								
5								
6								
7	S2		SM	Dense, brown with gray and red mottling, Silty SAND with cobbles and boulders; boulders up to 14 inches in diameter; moist to wet.	29	47		
8								
9	S3		GP-GC	Very dense, yellow brown, GRAVEL with Clay (weathered bedrock); moist to wet.	41			
				TP-5 Terminated at 9.5ft (Groundwater encountered at 3 feet bgs. Test pit backfilled with excavated soils and tamped to grade.)				

TRUE NORTH

True North Geotechnical

219 W. 4th Street Vancouver, WA 98660

Phone: (360) 984-6584

Geotechnical Log - Test Pit

TP-6

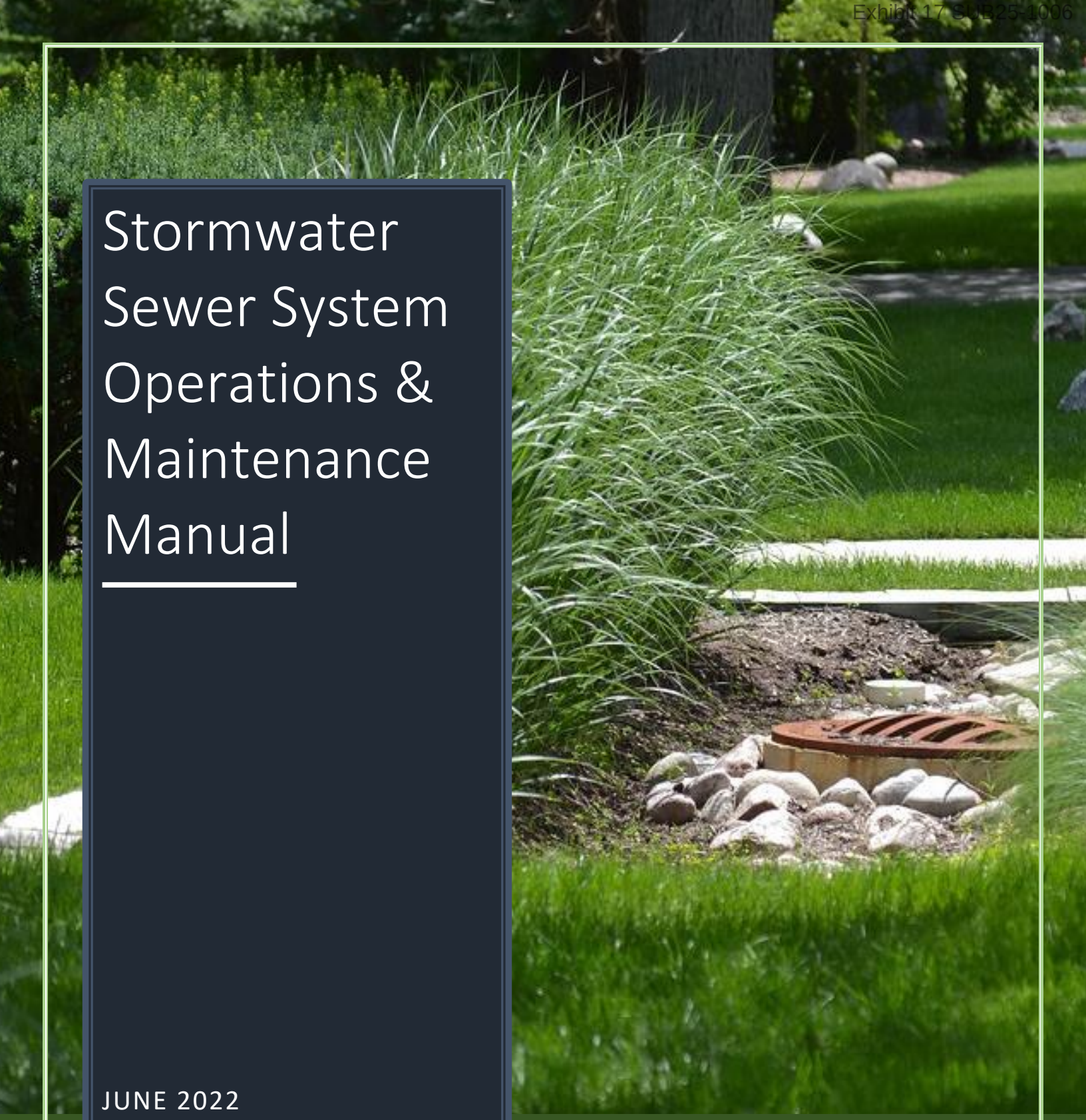
UTM	: 10T	**Excavator**	: Link-Belt	**Job Number**	: 24-0431-2
Latitude	: 45.64090	**Excavator Supplier**	: Thompson Brothers Excavating	**Client**	: Pacific Lifestyle Homes
Longitude	: -122.44529	**Logged By**	: LS	**Project**	: Landing at Green Mountain - Phase II
Ground Elevation	: 245.31 (ft)	**Reviewed By**	: TJN	**Location**	: 22007 NE 28th St, Camas, WA 98607, USA
Total Depth	: 8 ft BGL	**Date**	: 03/21/2025	**Loc Comment**	:

Depth (ft)	Sample No.	Graphic Log	USCS Symbol	Soil Description	Water Content (%)	Fines Content (%)	Pocket Pen (TSF)	Notes
1			ML	Soft, dark brown, SILT; heavily rooted to 0.75 feet bgs; moist.				
2			GM	Dense, gray brown, Silty GRAVEL; slightly moist to moist.				
3	S1				45			
4								
5								
6	S2				36	49		
7								
	S3		SC	Very dense, yellow gray, Clayey SAND with cobbles and boulders (weathered bedrock); moist to dry.	54			

TP-6 refusal at 8ft (Refusal at 8 feet bgs due to practical equipment failure. Groundwater not encountered. Test pit backfilled with excavated soils and tamped to grade.)

APPENDIX D

Operations and Maintenance Manual



Stormwater Sewer System Operations & Maintenance Manual

JUNE 2022

City of Camas
Stormwater Division | Public Works

City of Camas WASHINGTON

Page left blank intentionally

Table of Contents

Introduction 5
Background 5
Purpose 5
Manual Layout 6
Emergent Treatment Technologies 6
Mosquito Control 6
Material Disposal and Spills 6
Vegetated Facilities 8
Biofiltration Swale 8
Wet Biofiltration Swale 9
Filter Strip 10
Detention Pond 11
Wet Pond 12
Infiltration Facility 13
Rain Garden 14
Bioretention 16
Conveyance Ditch 17
Stormwater Structures 18
Catch Basin 18
Field/Ditch Inlet 19
Manhole 21
Debris Barrier 23
Sediment Trap 24
Energy Dissipater 26
Discharge Point 27
Oil/Water Separators 28
Flow Control Structures/Flow Restrictors 29
Storm Sewer Pipe 30
Closed Detention System 31

Drywell 32
Pond Leveler System 33
Dispersion Trench 34
Special Facilities 35
Manufactured Media Filter 35
Permeable Pavement 36
Modular Wetland 37
Tree Box Filter 38
Miscellaneous Items 39
Fences, Gates and Water Quality Signs 39
Access Roads and Easements 41
Pavement Sweeping 42
Repair/Replacement Activities 43
Minor Culvert Repair (Not in a Stream) 43
Major Culvert Repair (at a Stream Crossing) 43
Vegetation Management 44
Integrated Pest Management (IPM) Principles 44
Plants and Groundcover 45
References 46

Introduction

Background

All public and privately owned, roads, parking lots, residential developments, commercial or industrial developments, or school facilities have various components that make up a storm system. These components consist of conveyance pipes, catch basins, manholes, roadside ditches, stormwater facilities (such as bioswales, detention ponds, wet ponds, treatment filters, etc.), landscaping and any other structure that collects, conveys, controls, and/or treats stormwater. Regardless of the component, all storm systems eventually discharge into 'waters of the state' which are streams, rivers, lakes, and wetlands.

Under the Federal Clean Water Act (FCWA) and in compliance with the Department of Ecology's NPDES Phase II Permit, 'waters of the state' are to be protected from contamination. This in turn protects threatened and endangered species under the Federal Endangered Species Act (FESA).

One way to protect 'waters of the state' is to provide the proper maintenance of all storm system components. It is the responsibility of the City of Camas (City) to ensure that all components of the public storm system be properly maintained and operated. The City is responsible for those components that are located within the City's right-of-way, such as the conveyance pipes, manholes, catch basins, roadside ditches, and stormwater facilities. A large part of the stormwater facilities in the City are privately owned and maintained by the property owners. These property owners include, but are not limited to, Homeowners Associations (HOAs), school district, businesses, and commercial/industrial site owners.

Purpose

This manual is intended to help, both public and private stormwater facility maintenance operators, meet the requirements of City Municipal Code 14.02.090 for proper maintenance and operation of the various storm system components. Proper maintenance will help to assure that:

- Stormwater facilities operate as they were designed;
- Storm systems are cleaned of the pollutants that they trap, such as sediment and oils, so that storm systems are not overwhelmed and become pollutant sources;
- Pollutant sources are removed, or minimized, prior to entering the storm system.

Along with keeping a site from flooding, properly maintained storm system can help reduce surface water and groundwater pollution. Most sites have some type of stormwater control component designed to limit the environmental and flooding damage caused by stormwater runoff. These components require more labor intensive maintenance than a system of pipes and catch basins.

Manual Layout

This manual is broken out into various best management practice (BMP) maintenance components. For each BMP maintenance component, this manual will:

- Briefly describe the component type, e.g. facility or activity.
- Describes potential maintenance issues and/or problems.
- Describes conditions when maintenance is required.
- Minimum performance standards and suggested maintenance methods.

Additional information may be found in other manuals, such as the Washington Department of Ecology's *Stormwater Management Manual for Western Washington (SWMMWW), Vols. V*, and Ecology's LID manual.

Inspection of a stormwater facility will determine if conditions require a maintenance action. The maintenance standard is not the required condition at all times. Exceeding a condition, between inspections and/or maintenance, does not automatically constitute a violation of these standards. The inspection and maintenance schedules should be adjusted to minimize the length of time that a facility is in a condition that requires maintenance.

Emergent Treatment Technologies

Some stormwater treatment facilities are designed and installed with emerging technologies that are not standard at the time of their installation. If not found in this manual, a treatment facility may be an emerging technology approved by Washington Department of Ecology; the maintenance standards can be found at Emerging Stormwater Treatment Technologies.

Mosquito Control

Mosquitoes are annoying and sometimes pose a serious risk to public health. They can transmit diseases such as West Nile Virus and equine encephalitis. Above-ground stormwater facilities should be designed to allow water to flow through or infiltrate in less than 48 hours. Presence of mosquitos in a stormwater facility may indicate a clogged outlet, compromised infiltration capacity, or other defect that should trigger inspection and may require maintenance.

If mosquitos are identified during a stormwater facility maintenance or inspection and are a concern, a request to the Clark County Mosquito Control District for service or information regarding mosquito control can be made online at Mosquito Control District or at the 24-hour request line, 360-397-8430.

Material Disposal and Spills

The disposal of waste, e.g. sediment or standing water, from the maintenance of the stormwater facilities and storm system components shall be conducted in accordance with federal, state, and local regulations, including the Solid Waste Handling Standards chapter 173-350 WAC, Minimum Functional Standards for Solid

Waste Handling chapter 173-304 WAC and Appendix IV-B: Management of Street Waste Solids and Liquids of the SWMMWW. Dangerous waste must be handled following, Dangerous Waste Regulations chapter 173-303 WAC. Vegetation to be recycled and disposed of at local receptacle locations.

For major spills, coordinate removal/cleanup with the City at 360-817-1563 and notify Department of Ecology at 360-407-6300.

Vegetated Facilities

Biofiltration Swale

Biofiltration swales use grass or other dense vegetation to filter sediment and oily materials out of stormwater. Usually, they look like flat-bottomed channels with grass growing in them. As water passes through the vegetation, pollutants are removed through the effects of filtration, infiltration and settling.

See SWMMWW Appendix V-A, Table V-A.8 for biofiltration swale maintenance standards. If available, reference record drawings for seed mix and groundcover replacements, or see SWMMWW BMP T9.10, Tables V-7.3 and V-7.4. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.



Wet Biofiltration Swale

A wet biofiltration swale is a variation of basic biofiltration swale for use where the centerline slope is slight, groundwater table are high, or a continuous low base flow is likely to result in wet soil conditions for long periods of time. Where continuously wet soil exceeds about 2 weeks, typically grasses will die. Thus, vegetation specifically adapted to wet soil conditions is needed. Different vegetation requires modification of several of the design and maintenance requirements from the basic biofiltration swale.

See SWMMWW Appendix V-A, Table V-A.9 for wet biofiltration swale maintenance standards. If available, reference record drawings for seed mix and groundcover replacements, or see SWMMWW BMP T9.20, Table V-7.5. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.



Filter Strip

Filter strips are linear strips of grass that remove sediment and oils from stormwater by filtering it. Stormwater is treated as it sheet flows across the filter strip. Usually, filter strips are placed along the edge of linear paved areas, such as parking lots and roads. Where designed filter strips are installed; road shoulders should only be graded to maintain level flow off the road.

See SWMMWW Appendix V-A, Table V-A.10 for filter strip maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP T9.10, Table V-7.3.



Detention Pond

Detention pond facilities are designed to hold and slowly release stormwater by use of a pond with a specially designed control structure. Styles vary greatly from well-manicured to natural appearing. Generally, native vegetation is preferred for reduced maintenance and enhance wildlife habitat. Some facilities are designed to appear as natural water bodies or are in a park-like setting.

See SWMMWW Appendix V-A, Table V-A.1 for detention pond maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP D.1, Table V-12.3. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.



Wet Pond

A wet pond is an open basin that retains a permanent pool of water year-round or only during the wet season. The volume of the wet pond allows sediment and other pollutants to settle out of the runoff. Wetland vegetation is typically planted within the wet pond to provide additional treatment through nutrient removal. Detention quantity control can be provided with additional temporary storage volume above the permanent pool elevation.

See SWMMWW Appendix V-A, Table V-A.11 for wet pond maintenance standards. If available, reference record drawings for seed mix and plants replacement, or see SWMMWW BMP D.1, Table V-12.3 for seed mix and BMP T10.10, Table V-8.1 for plants. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.



Infiltration Facility

Infiltration facilities dispose of water by holding it in an area where it can soak into the ground. These are open facilities that may either drain rapidly and have grass bases or have perpetual ponds where water levels rise and fall with stormwater flows. Infiltration facilities may be designed to handle all of the runoff from an area or they may overflow and bypass larger storms.

Since the facility is designed to pass water into the ground, generally after passing through a sediment trap/manhole, anything that can cause the base to clog will reduce the performance and is a large concern. Generally, infiltration basins are managed like detention ponds, but with greater emphasis on maintaining the capacity to infiltrate stormwater.

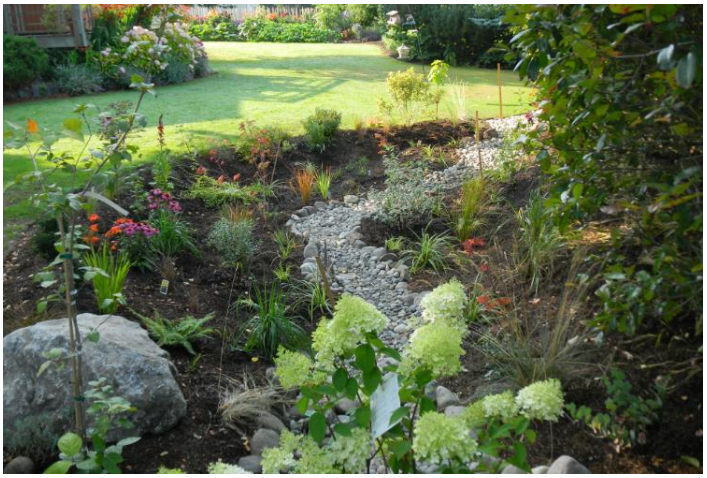
See SWMMWW Appendix V-A, Table V-A.2 for infiltration facility maintenance standards. If available, reference record drawings for seed mix replacement, or see SWMMWW BMP D.1, Table V-12.3. Removal of cattail is required when vegetation is crowded out by very dense clumps of cattails, prevents water flow, or alters the designed functionality.



Rain Garden

Rain gardens are non-engineered, shallow, landscaped depressions with compost-amended soils and adapted plants. The depression temporarily stores stormwater runoff from adjacent areas. Some or all the influent stormwater passes through the amended soil profile and into the underlying native soil. Stormwater that exceeds the storage capacity is designed to overflow to an adjacent drainage system.

If available, reference record drawings for plant replacements, or see Rain Garden Handbook for Western Washington, Appendix A for recommendation on rain garden plants. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.



Rain Garden			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Evidence of trash and debris	Remove trash and debris
Side slopes	Erosion	Persistent soil erosion on slopes	Replenish mulch areas throughout rain garden - on the sides and bottom of the rain garden and around the perimeter (and on berm if applicable).
Bottom area	Sediment	Visible sediment that reduces drainage rate	Remove sediment accumulation
		Sediment deposited from water entering the rain garden	Remove sediment, determine the source, and stabilize area
	Leaves	Matted accumulation of leaves reducing drainage rate	Remove leaves
Ponded water	Ponding	Ponded water remains for more than 3 days after the end of a storm	Remove sediment, leaf litter and/or debris accumulation
Pipe inlet/outlet	Pipe	Water is backing up in pipe	Clear pipes of sediment and debris with snake and/or flush with water
		Damaged or cracked drain pipes	Repair or seal cracks, or replace as needed
Inlet rock pad	Erosion	Rock or cobble is removed, missing and flow is eroding soil.	Replace rock and reestablish pad
Weeds	Weeds	Weeds are present	Remove weeds and apply mulch after weeding
Vegetation	Dying Vegetation	Dying, dead or unhealthy plants	Remove diseased plants or plant parts and dispose, then replace
	Sight Distance	Vegetation reduces sight distances and sidewalk	Keep sidewalks and sight distances on roadways clear
	Blockage	Vegetation is crowding inlets and outlets	Remove vegetation crowding inlets and outlets
	Poor Vegetation Growth	Yellowing, poor growth, poor flowering, spotting or curled leaves, weak roofs, or stems	Test soil to identify specific nutrient deficiencies.
			Do not use synthetic fertilizers
			Consider selecting different plant for soil conditions
Mulch	Bare Soil	Bare spots are present or mulch depth less than 2 inches	Supplement mulch with hand tools to a depth of 2 to 3 inches, keep mulch away from woody stems.

Bioretention

Bioretention facilities are engineered facilities that store and treat stormwater by filtering it through a specified soil profile. Water that enters the facility ponds in an earthen depression or other basin (e.g., concrete planter) before it infiltrates into the underlaying bioretention soil. Stormwater that exceeds the surface storage capacity overflow to an adjacent drainage system. Treated water is either infiltrated into the underlying native soil or collected by an underdrain and discharged. An underdrain system can be comprised of perforated or slotted pipe, wrapped in an aggregate blanket.

See SWMMWW Appendix V-A, Table V-A.21 for bioretention maintenance standards. If available, reference record drawings for plant replacements, or see LID Technical Guidance Manual for Puget Sound, Appendix 1 for plant recommendations. Presence of cattails is a sign that that there is water ponding and the facility is not functioning as design. Cattails will need to be removed and further investigation may be required.



Conveyance Ditch

Ditches are often manmade open-channels that convey stormwater runoff. These ditches are maintained to prevent localized flooding.



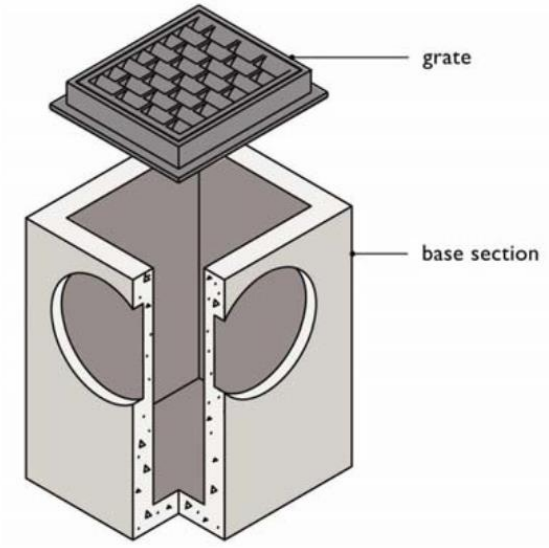
Conveyance Ditch			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Sediment	Sediment exceeds 20% of ditch depth or affects the historic or designed hydraulic capacity.	Remove sediment deposits. When finished, ditch should be level from side to side and drain freely in intended direction.
	Standing Water	Excessive standing water in ditch between storms due to ditch not draining freely	If possible, repair cause of poor drainage. This may include but is not limited to the following activities: remove sediment or trash blockages, improve grade of ditch.
	Eroded or Unstable Side Slopes	When grass is sparse, bare or eroded, patches occur in more than 20% of the ditch	Determine why grass growth is poor and correct that condition. Replant with plugs of grass at eight-inch intervals or reseed. If cause is excessive moisture replace grass with wetland plantings.
	Vegetation	Grass is excessively tall (greater than 15 inches). Nuisance weeds and other vegetation start to take over ditch.	Mow vegetation and/or remove nuisance vegetation so that flow is not impeded. Grass should be mowed to a height of 3 to 4 inches.
	Bare Soil	Poor vegetation coverage.	Reseed poor vegetation areas. Reference "Low Grow" seed mix, see SWMMWW BMP C120 Table II-3.4
	Inlet/Outlet Pipes or Culverts	Inlet/outlet area clogged with sediment and/or debris	Remove material so that there is no clogging or blockage in the inlet and outlet area
	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from ditch.
	Erosion/Scouring	Eroded or scoured ditch bottom	Permanently stabilize ditch bottom

Stormwater Structures

Catch Basin

A catch basin is an underground concrete structure with a slotted grate that collects stormwater runoff and route it through the underground pipes. Catch basins typically provide a sump below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. Some catch basins are fitted with a spill control device such as an inverted elbow on the outlet pipe to control grease or oils. The most common tool for cleaning catch basins is a vactor truck which is used to remove sediment and debris from the sump. The sediment and oils if not removed from the catch basins have the potential to pollute downstream waterbodies. Unless you have Occupational Safety and Health Administration (OSHA) approved confined space training and equipment, never enter a catch basin. There is a considerable risk of poisonous gas and injury.

See SWMMWW Appendix V-A, Table V-A.5 for catch basin maintenance standards.



Field/Ditch Inlet

An inlet is a concrete, plastic or steel structure fitted with a slotted grate to collect stormwater runoff and route through underground pipes. A field inlet has a flat grate, and a ditch inlet has an angled grate. These inlets typically provide a sump below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. Some of these inlets are fitted with a spill control device such as an inverted elbow on the outlet pipe to control grease or oils. The most common tool for cleaning out the inlet is a vactor truck which is used to remove sediment and debris from the sump. The sediment and oils if not removed from the inlet has the potential to pollute downstream water bodies. Unless you have OSHA approved confined space training and equipment, never enter an inlet. There is a considerable risk of poisonous gas and injury.



Field Inlet

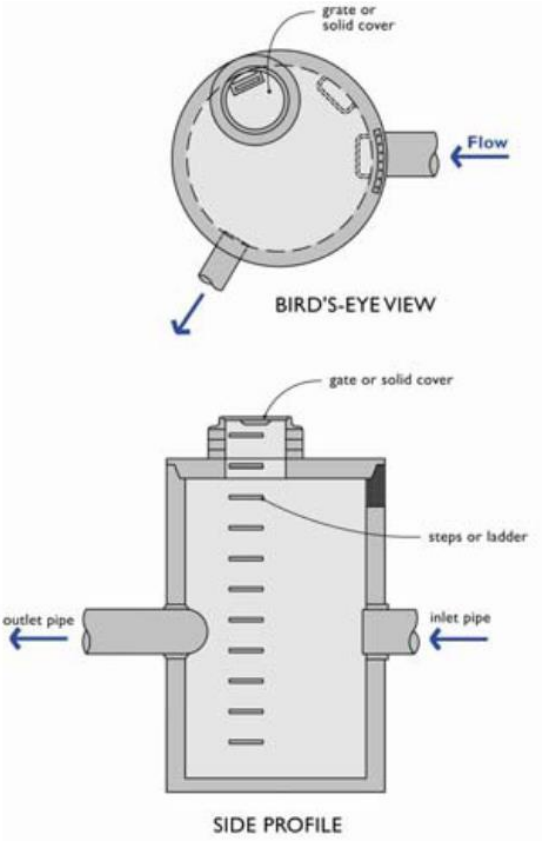


Ditch Inlet

Field Inlet/Ditch Inlet			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash & Debris	Trash or debris blocking inletting capacity by more than 10%.	Remove trash or debris blocking grate opening.
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	Remove dead animals or vegetation present within the field/ditch inlet.
	Sediment	Sediment has accumulated to within six inches of the invert of the lowest pipe	Remove sediment
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch.	Repair top slab to be free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Make adjustments so that frame is sitting flush on the riser rings or top slab and is firmly attached.
	Fractures or Cracks in Field Inlet Walls/Bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Regrout pipe and secure at field inlet wall.
	Settlement/ Misalignment	If failure of field inlet has created a safety, function, or design problem.	Replace or repair field inlet to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the inlet opening.	Remove vegetation blockage from basin opening.
	Contamination and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
Metal Grates	Grate Not in Place	Grate is missing or only partially in place. Any open field inlet requires maintenance.	Replace missing grate, cover field inlet
	Grate opening Unsafe	Grate with opening wider than 7/8 inch.	Repair grate opening
	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Replace missing grate or repair broken member(s)

Manhole

Manholes are large cylindrical underground structures usually set at storm sewer pipe connections. Manholes are used in storm sewer system at any change in direction, slope, pipe material or pipe size. Some manholes have sumps and fitted with stormwater flow control structures such as orifices or weirs. Unless you have OSHA approved confined space training and equipment, never enter a manhole. There is a considerable risk of poisonous gas and injury.

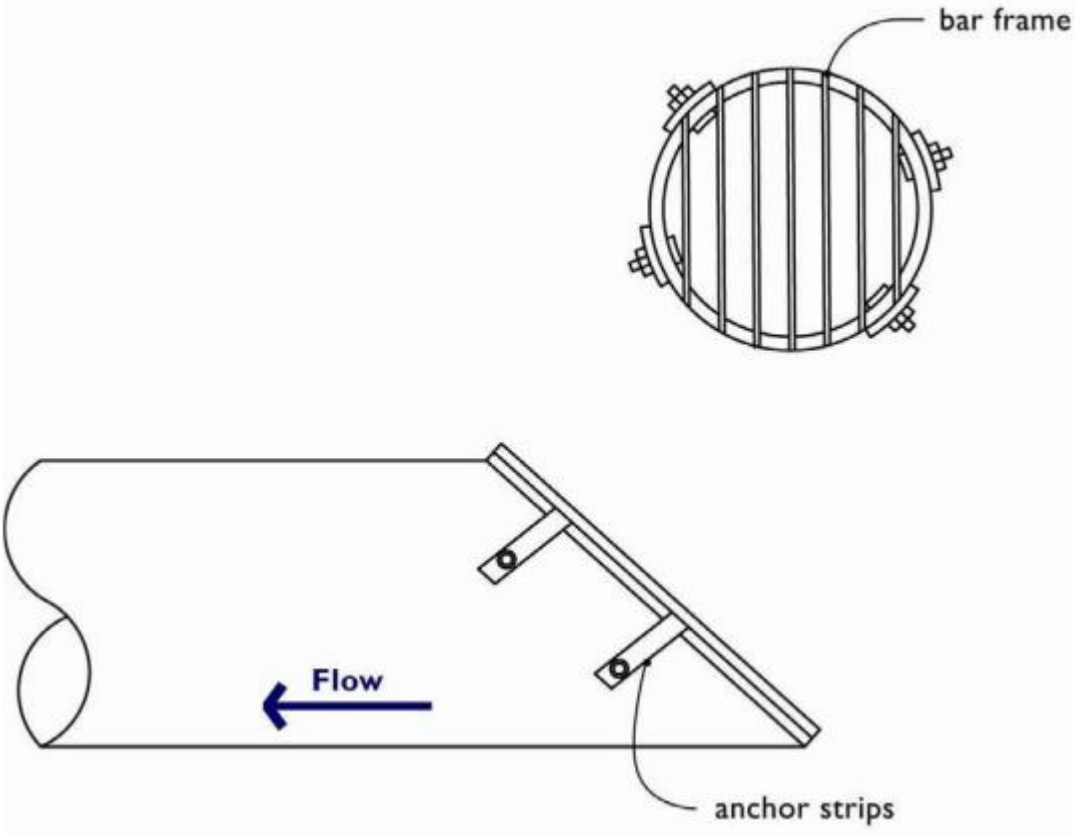


Manhole			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Trash or debris has accumulated to within six inches of the invert of the lowest pipe.	Remove all trash or debris from manhole.
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.	Remove trash or debris from inlet and outlet pipes.
	Sediment	Sediment has accumulated to within six inches of the invert of the lowest pipe.	Remove all sediment from manhole
	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch.	Repair top slab to be free of holes and cracks.
		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached	Make adjustments so that frame is sitting flush on the riser rings or top slab and is firmly attached.
	Fractures or Cracks in Manhole Walls/Bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering manhole through cracks.	Regrout pipe and secure at manhole wall.
	Settlement/ Misalignment	If failure of manhole has created a safety, function, or design problem.	Replace or repair manhole to design standards.
Cover	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.	Replace missing cover, cover manhole.
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread.	Repair opening mechanism
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure.	Make adjustments so that one maintenance person can remove the manhole cover.
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Repair or replace ladder to meet design standards and allow maintenance person safe access.
Control Structure/Flow Restrictor	See Control Structure/Flow Restrictor		

Debris Barrier

Debris barriers and trash racks are barred covers to pipe openings. They prevent large objects from entering pipes and keeps pets and people out of the pipes as well.

See SWMMWW Appendix V-A, Table V-A.6 for debris barrier maintenance standards.



Profile View

Sediment Trap

A sediment trap is a concrete structure typically fitted with slotted grate or multiple slotted grates. The concrete structure provides a storage volume (sump) below the outlet pipe to allow sediment and debris to settle out of the stormwater runoff. A sediment trap can be a fully enclosed concrete structure (above or below ground) with a sump, inlet pipe(s) and outlet pipe.



Sediment Trap			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Trash and debris which is located immediately in front of the sediment trap opening or is blocking the inlet capacity of the basin by more than 10%	Remove trash and debris
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).	Remove dead animals or vegetation present within the sediment trap.
	Sediment (non-enclosed structure)	Sediment depth exceeds 2 inches.	Remove sediment
	Sediment (enclosed structure)	Sediment depth within 6 inches from lowest invert	Remove sediment
	Fractures or Cracks in Sediment Trap	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering sediment trap through cracks.	Regrout pipe and secure at sediment trap wall.
	Settlement/ Misalignment	If failure of sediment trap has created a safety, function, or design problem.	Replace or repair sediment trap to design standards.
	Vegetation	Vegetation growing across and blocking more than 10% of the sediment trap opening	Remove vegetation
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Remove contaminants and/or pollutants. (Coordinate removal/cleanup with local water quality response agency)
Slotted Grate	Trash and Debris	Trash and debris that is blocking more than 20% of the grate surface inlet capacity	Remove trash and debris from grate
	Damaged or Missing Grate	Grate missing or broken member(s) of the grate	Replace or repair grate to design standards.
Cover (enclosed structure)	Cover Not in Place	Cover is missing or only partially in place.	Replace missing cover
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure or latch broken	Make adjustments so that one maintenance person can remove the cover and/or repair broken latch.

Energy Dissipater

Energy dissipaters are critical for preventing erosion at storm drain outfalls. There are a variety of designs, including wire gabion baskets, rock splash pads, trenches, and specially designed pools or manholes. They are installed on or near the inlet or outlet to a closed pipe system to prevent erosion at these locations.

See SWMMWW Appendix V-A, Table V-A.7 for energy dissipater maintenance standards.



Discharge Point

Stormwater facility discharge points may convey drainage from the stormwater facility into open channels, ditches, ponds, wetlands, streams, or lakes. Stormwater facility discharge points need to be assessed to make sure stormwater is not causing any negative impacts to these drainage areas.



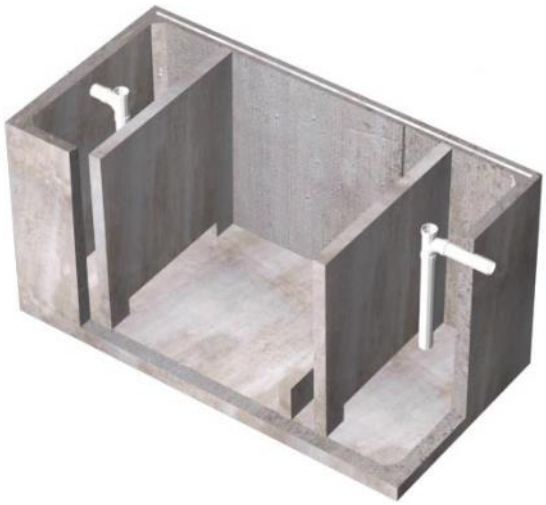
Discharge Point			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Monitoring	Contaminants and Pollution	Any evidence of oil, gasoline, sewage, contaminants, or other pollutants	Identify and remove source. The effluent discharge should be clear and free of odor. Notify City at (360) 817-1567.
	Ditch or Stream Banks Eroding	Erosion, scouring, or head cuts in ditch or stream banks downstream of facility discharge point due to flow channelization or higher flows.	Stabilize ditch or stream banks. Report to City for engineer evaluation.
General	Missing or Moved Rock	Only one layer of rock exists above native soil in an area five square feet or larger, or any exposure of native soil	Replace or repair rock pad to design standards
	Erosion	Soil erosion in or adjacent to rock pad	Replace or repair rock pad to design standards
	Sediment	Sediment blocking 20% of the pipe diameter	Remove sediment
	Obstructions	Roots or debris enters pipe or deforms pipe, reducing flow	Remove roots from pipe by mechanical methods; do not use root-dissolving chemicals in storm sewer pipes. If necessary, remove vegetation over the line.
	Pipe Rusted or Deteriorated	Any part of the piping that is crushed or deformed excessively or any other failure to the piping	Repair or replace pipe
Energy Dissipater	See Energy Dissipater		

Oil/Water Separators

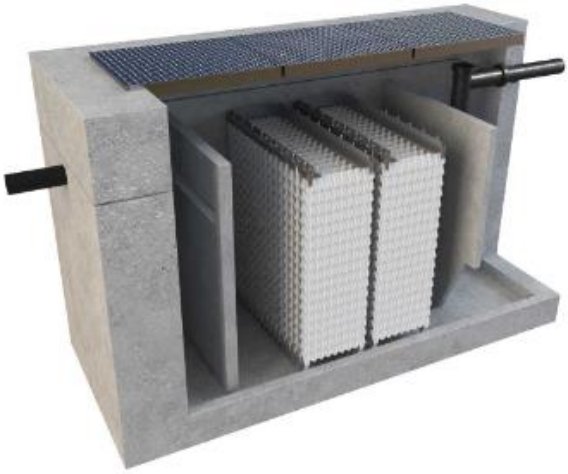
An oil/water separator is an underground vault that treats stormwater by mechanically separating oil from water. The oil rises to the surface and floats on the water and sediment settles to the bottom. Oil/water separators are typically utilized in locations where high oil concentrations in the stormwater runoff are anticipated (e.g., service and fuel stations). Oil/water separators are most commonly used as the first pretreatment facility in a series of stormwater management facilities.

These facilities have special problems for maintenance and should be serviced by contractors. The main issues are working in confined spaces and properly handling any sludge and oil cleaned from vaults or oil/water separators. Manufacturer's recommendations for maintenance should be followed at a minimum.

See SWMMWW Appendix V-A, Table V-A.16 for baffle oil/water separator maintenance standards and Table V-A.17 for coalescing plate oil/water separator maintenance standards.



Baffle Oil/Water Separator

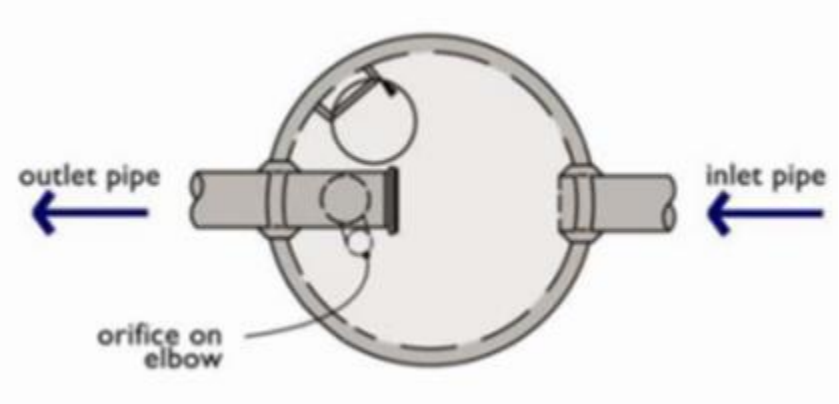


Coalescing Plate Oil/Water Separator

Flow Control Structures/Flow Restrictors

Flow control structures and flow restrictors direct or restrict flow in or out of facility components. Outflow controls on detention facilities are a common example where flow control structures slowly release stormwater at a specific rate. The flow is regulated by a combination of orifices (holes with specifically sized diameters) and weirs (plates with rectangular or 'V' shaped notch). Lack of maintenance of the control structure can result in the plugging of an orifice. If these flow controls are damaged, plugged, bypassed, or not working properly, the facility could overtop or release water too quickly.

See SWMMWW Appendix V-A, Table V-A.4 for control structure/flow restrictor maintenance standards.



Plan View

Storm Sewer Pipe

Storm sewer pipes convey stormwater. Storm pipes are constructed of many different types of materials and are sometimes perforated to allow groundwater to be collected by the storm system. Storm pipes are cleaned to remove sediment or blockages when problems are identified. Storm pipes must be clear of obstructions and breaks to prevent localized flooding.



Storm Sewer Pipe			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Obstructions, Including Roots	Obstruction exists in pipe, reducing flow capacity	Remove obstruction. Use mechanical methods. Do not put root-dissolving chemicals in storm sewer pipes. If necessary, remove the vegetation over the line.
	Pipe Dented or Broken	Inlet/outlet pipe damaged or broken	Repair or replace pipe
	Pipe rusted or deteriorated	Any part of the piping that is crushed or deformed excessively or any other failure to the piping	Repair or replace pipe
	Sediment and Debris	Sediment or debris depth is greater than 15% of the pipe diameter	Clean pipe. Evaluate source of sediment upstream of the pipe and stabilize if possible.
	Broken Trash Screen	Trash screen is broken or missing parts	Repair or replace trash screen
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.

Closed Detention System

A closed detention system functions similarly to a detention pond but with the storage volume provided by an underground structure. The structure is typically constructed of large diameter pipe, plastic chamber structure or a concrete vault. These systems are typically utilized for sites that do not have space available for an above-ground system and are more commonly associated with commercial sites.

Underground detention systems are enclosed spaces where harmful chemicals and vapors can accumulate. Therefore, the maintenance of these facilities should be conducted by an individual trained and certified to work in hazardous confined spaces.

See SWMMWW Appendix V-A, Table V-A.3 for closed detention maintenance standards.



Drywell

Drywells are perforated, open-bottomed manholes used to infiltrate stormwater into the ground. While not the intended use, drywells trap sediment and some of the oil pollutants in stormwater runoff. Drywells are more likely to fill with oily sediment in areas that lack swales or other treatment facilities. Fine oil sediment can clog drywells and lead to localized street flooding. Also, pollutants discharged into drywells can migrate into groundwater. Drywells were often installed in closed topographic depressions, areas with will-drained soils, or areas having inadequate storm sewers. Often, drywells contain groundwater.



Drywell			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Does not Dissipate Stormwater	Does not dissipate stormwater	Replace or repair
	Opening Clogged	Openings are clogged, reducing capacity	Clear openings or convert existing drywell to a sediment trap and install a new drywell or drainage trench. To convert to a sediment trap: grout holes, cover base with concrete, and add piping. Alterations to any storm facility cannot be done without approval from the City of Camas.
	Standing Water	Standing water indicates the drywell is into the groundwater table	Rebuild drywell to prevent stormwater from going directly into groundwater
	Trash and Debris	Trash or debris blocking any inlet or outlet pipe	Remove trash and debris
	Sediment	Sediment in drywell exceeds 60 percent of the depth below the lowest pipe	Remove sediment
	Structure Damage	Structure unsound	Replace or repair drywell to design standards.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
Cover	Cover Not in Place	Cover is missing or only partially in place.	Replace missing cover
	Cover Difficult to Remove	One maintenance person cannot remove cover after applying normal lifting pressure.	Make adjustments so that one maintenance person can remove the drywell cover.

Pond Leveler System

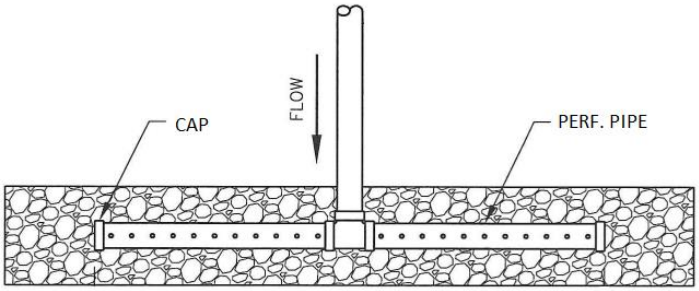
The pond leveler system consists of an intake cage and outlet pipe. This system is used to bypass beaver dams. The pond leveler system creates a permanent leak through the beaver dam that the beavers cannot stop.



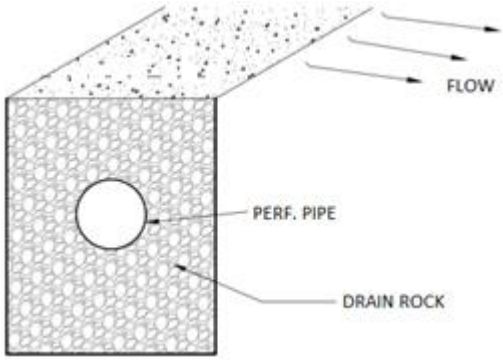
Pond Leveler			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Intake Cage	Debris and sediment	Debris and sediment build up around cage	Remove debris and sediment build up around cage. Recommended tools: potato rake and a narrow, stiff shop broom.
	Structure	Broken cage, resulting in holes larger than 6" diameter.	Repair hole with similar cage material, attach with hog rings.
	Obstruction to inflow pipe	Debris obstructing pipe flow inside intake cage	Remove obstruction
Outflow Pipe	Obstruction	Debris obstructing outflow	Remove obstruction

Dispersion Trench

Dispersion trench are grave-filled trenches, which serve to spread runoff over vegetated pervious areas. This BMP reduce peak flows, provide some infiltration, and water quality benefits.



Plan View



Cross Section

Dispersion Trench			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from site.
	Poisonous Vegetation and noxious weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations.	Remove noxious weeds. Compliance with State or local eradication policies required. Apply requirements of adopted IPM policies for the use of herbicides.
	Contaminants and Pollution	Any evidence of oil, gasoline, contaminants, or other pollutants	Identify and remove source. Notify City at (360) 817-1567.
	Rodent Holes	Any evidence of rodent holes.	Fill holes.
Perforated Pipe	Sediment and/or obstruction	Sediment and/or obstruction impeding the flow, causing backup	Remove sediment and/or obstruction

Special Facilities

Manufactured Media Filter

Manufacture media filters are passive, flow-through, stormwater treatment systems. They are comprised of manholes or vaults that house media-filled filter cartridges. Stormwater passes through a filtering medium, which traps particulates and/or absorb pollutants such as dissolved metals and hydrocarbons. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharge to a pond or open channel drainage way.

The filter media can be housed in cartridge filters enclosed in concrete vaults or catch basins. Structures will have vault doors or manhole lids for maintenance access. Various types of filter media are available from different manufactures. Determine the type of filter media used and consult manufacturer for maintenance recommendations.

See SWMMWW Appendix V-A, Table V-A.15 for manufactured media filters maintenance standards.

Manufactured Media Filter – Additional Maintenance Standards			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Below Ground Vault or Manhole	Sediment Accumulation in Vault (no first chamber)	Sediment depth exceeds 4-inches on vault floor.	Remove sediment from vault floor. May require replacing media cartridges, consult manufacturer.



Permeable Pavement

Permeable pavement is a paving system which allows rainfall to percolate through the surface into the underlying soil or an aggregate bed, where stormwater is stored and infiltrated to underlying subgrade, or removed by an overflow drainage system.

See SWMMWW Appendix V-A, Table V-A.22 for permeable pavement maintenance standards.



Modular Wetland

Modular wetlands linear is a biofiltration system that utilizes horizontal flow which allows for a smaller footprint, higher treatment capacity and design versatility. This system can be utilized downstream of storage for additional volume control and treatment. The modular wetland is contained in an underground vault that has different chambers containing media. Some modular wetlands can have plants growing out of it, but it is not required for the system to function. Once filtered through the media, the treated stormwater is directed to a collection pipe or discharge to a pond or open channel drainage way.



Modular Wetland			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Missing or damaged components	Missing or damaged internal components or cartridges	Replace missing or repair damaged internal components or cartridges
Inlet or Outlet	Obstruction	Obstruction to inlet or outlet that impedes flow	Remove obstruction
Pretreatment Chamber	Floatables	Excessive accumulation of floatables, in which the length and width of the chamber is fully impacted more than 18"	Remove floatables
	Sediment	Excessive accumulation of sediment, more than 6"in depth	Remove sediment
Filter Cartridges	Sediment	Excessive accumulation of sediment on media, more than 85% clogged (blackish color)	Replace media
Vegetation (if applicable)	Overgrown	Overgrown vegetation	Trim/prune vegetation in accordance with landscaping and safety needs
Structure	Cracks in structure	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through cracks	Repair cracks in vault

Tree Box Filter

Tree box filter is a stormwater treatment system incorporating high performance biofiltration media to remove pollutants from stormwater runoff.



Tree Box Filter			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
Inlet	Excessive sediment or trash accumulation	Accumulated sediments or trash impair free flow of water into system	Remove sediment and/or trash
Mulch cover	Trash and debris	Excessive trash and/or debris accumulation	Remove trash and/or debris.
	Standing water	Ponding of water over mulch due to excessive fine sediment accumulation or spill of petroleum oils	Remove mulch and replace, contact manufacturer for advice
Vegetation	Plant not growing or in poor condition	Soil/mulch too wet, evidence of spill, incorrect plant selection, pest infestation, vandalism to plants	Plants should be healthy and pest free, contact manufacturer for advice
	Plant growth excessive	Plants should be appropriate to the species and location	Trim/prune plants in accordance with landscaping and safety needs
Structure	Cracks in structure	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through cracks	Repair cracks in vault

Miscellaneous Items

Fences, Gates and Water Quality Signs

Fences are installed around the perimeter of stormwater facilities as a means of protecting the public, as they restrict entrance to the facility. Gates are installed to allow for maintenance access. Gates will be secured, typically with a double lock system (daisy chain) that allows access to the City and to the property owner's maintenance crew.

Water Quality Signs are installed on the fences, or on sign poles, within public view as a means of educating the public as to the presence of a stormwater facility. These signs also have a number located in the upper right hand corner that is cross referenced, at the City, to an address and maintenance responsibility. The publicly owned storm facility signs are green and the privately owned storm facility signs are white.



Public Storm Sign (Green) **Private Storm Sign (White)**

Fence, Gate and Water Quality Sign			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Gate or Fence Allows Unauthorized Entry	Openings in fence, missing gate, openings beneath fence allowing unauthorized access	Repaired gate and/or fence to prevent unauthorized access
	Locking Mechanism	Mechanism cannot be opened by one maintenance person with proper tools	Repair/replace lock
		No lock on gate, allows unauthorized entry	Add lock
	Damaged Parts	Posts out of plumb more than six inches	Plumb post
		Top rails of plump more than six inches	Repair top rails so that it is free of bends greater than 1 inch
	Erosion	Erosion has resulted in an opening under a fence that allows entry by people or pets	Replace soil under fence so that no opening exceeds 4 inches in height
	Sign	Sign is leaning more than 8 inches off vertical	Reset sign to plumb
		Sign is missing or 20% of surface is unreadable	Replace sign

Access Roads and Easements

Many stormwater facilities have access roads to bring in heavy equipment for facility maintenance. These roads are typically gravel and should be maintained for inspection access and ease of equipment entry. All facilities should allow access for the inspection process. The easement area should be adequately or otherwise stabilized. Bare soil areas will generate higher levels of stormwater runoff and increase erosion and sedimentation in stormwater facilities.

Access Road and Easements			
Maintenance Component	**Defect or Problem**	**Conditions When Maintenance Is Needed**	**Minimum Maintenance Required**
General	Erosion	Soils are bare or eroded	Seed or use other stabilization BMP
	Road Surface	Conditions of road surface may lead to erosion of the facility or limit access	Repair road
	Erosion of Ground Surface	Noticeable rills are seen in landscaped areas	Identify causes of erosion and implement BMPs to slow down/spread out the water. Fill, contour, and seed eroded areas. If needed, re-grade affected areas.
	Trash and Debris	Any trash and debris which exceed 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Remove trash and debris from site.
	Poisonous Vegetation and Noxious Weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations.	Remove noxious weeds. Compliance with State or local eradication policies required. Apply requirements of adopted IPM policies for the use of herbicides.
	Tree Growth and Hazard Trees	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If dead, diseased, or dying trees are identified.	Remove hazardous tree that impede with maintenance access and activities. Remove trees that are damaging the pipe system and/or blocking drain inlet. Remove dead, diseased, or dying trees. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood).
	Weeds (Non-poisonous)	Weeds growing in more than 20% of the landscaped area (tree and shrubs only).	Remove weeds
	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Destroy or remove insects from site. Apply insecticides in compliance with adopted IPM policies.

Pavement Sweeping

Pavement sweeping is performed as a means of removing sand, dirt, and litter from streets and curb gutters. Sweeping also reduces dust during dry weather. Pavement sweeping plays a large part in stormwater maintenance because it limits the amount of sediment washed into the municipal storm sewer system. The water quality procedure for street sweeping focuses on sediment removal and disposal. Reducing the amount of sediment washed into catch basins, curb inlets, detention facilities, drywells, and other facilities can save money because sweeping is generally cheaper that removing sediment from facilities. Sweeping also helps protect facilities from clogging with sediment.

Typically, the City sweeps the downtown area once a week and the whole city about three times per year. Most of the downtown area does not have water quality treatment. Pavement sweeping is the main source for pollution control.



Repair/Replacement Activities

Minor Culvert Repair (Not in a Stream)

This activity is for the replacement or repair of culverts and inlets. It applies only to structures that are in ditches that are specifically for storm drainage. These are ditches that do not carry water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, consult with the Washington Department of Fish and Wildlife and the City of Camas Public Works Department.

Major Culvert Repair (at a Stream Crossing)

This activity is the replacement or repair of culverts and inlets bridging a stream or ditch with flowing water during dry weather. If there is any question about whether the ditch is a storm drain or a stream, consult the Washington Department of Fish and Wildlife and the City of Camas Public Works Department.

These projects must meet all regulatory requirements such as State Environmental Policy Act (SEPA), Shoreline Permit, Hydraulic Project Approval (HPA) and Flood Plain.



Vegetation Management

The City recognizes the special importance of the rivers, streams, wetlands, ponds, and stormwater control and treatment facilities. The sensitive nature of such habitat, their plant and animal communities, and their direct link with other waterways require that we establish specific policies to ensure their health. All landscape management decisions for controlling unwanted vegetation, diseases, and pests should follow the Integrated Pest Management (IPM) principles and decision-making rationale.

Integrated Pest Management (IPM) Principles

1. Correctly identify the pest problem and understand their life cycle. Refer to online resources such as Washington State Noxious Weed Control Board and Washington Invasive Species Council.
2. Every landscape has a population of some pest insects, weeds, and diseases. Once the pest has been identified and studied, determine if low levels of the pest are tolerable. Small numbers of certain pests may not be harmful. If this is the case, simply continue to monitor the pest population.
3. If pest exceed tolerance thresholds, choose a safe and effective control method.
    a. Cultural methods of vegetation and pest control are preferred and are first employed. Cultural control changes the pest's environment: landscape fabric, mulch, soil amendments, altering the irrigation method of duration, crop rotation, crop covers, etc.
    b. Mechanical means of vegetation and pest control are next in line of preference and are utilized where feasible. Mechanical means consist of digging, hand-pulling, mowing, tilling, trapping, etc.
    c. Biological methods of vegetation and pest control are considered before chemical means, where they are feasible. Biological control uses natural enemies: beneficial insects, managed grazing, bird boxes and perches, etc.
    d. Chemical methods are used only when no other feasible methods exist. Chemical control is the use of pesticides to remove vegetation and pests.
4. Observe and record the results of the control treatment. Evaluate the effectiveness. If necessary, modify maintenance practices to support a healthy landscape and prevent recurrence of the pest.

A licensed pesticide applicator is required for performing any chemical application in stormwater facilities. Applicators must be licensed in Washington State with an aquatic endorsement (WAC 16-228-1545). Applicator must submit a copy of their license to the City prior to starting work. Aquatic pesticide products are recommended. No chemical application shall be applied directly in the water. Do not apply pesticide when it is raining. Check the weather and ensure there are multiple dry days before and after application. Do not apply pesticide on windy days to prevent drift movement of pesticide from target areas.

For vegetated areas outside of stormwater facilities, Washington State pesticide application laws and rules are followed, Chapter 17.21 RCW and Chapter 16-228 WAC.

Plants and Groundcover

Use plants that will thrive in the growing conditions of each facility. Growing conditions are affected by moisture, soil conditions, and light. Plants native to western Washington are preferred. Recommended plants, seed mixes and groundcover list for biofiltration swales, bioretention systems, rain gardens, and other facility types are given in the respective BMP maintenance sections. It is best to reference the stormwater facility record drawings for vegetation replacements, if available. Fertilization of vegetated stormwater facilities should be avoided.

The City has adopted a list of approved plants for use in development projects, and to assist homeowners in choosing appropriate plantings. The list also has prohibited undesirable plants. Only plants approved for use on the City of Camas Plant Materials are allowed within the City's right-of-way.

Mulches and other ground coverings are useful during the installation and restoration of landscapes as well as their ongoing maintenance. Mulches meet a variety of needs. They suppress weeds, help to retain moisture around plants, reduce possible erosion and provide visual enhancement. Possible risk impacts to consider when using mulch are inadvertent introduction of non-native plants or migration of mulch material into waterways.

Possible scenarios where trees should be removed and/or trimmed in a stormwater facility (always check if the stormwater facility has a liner before tree removal):

- Trees that pose a risk to a stormwater structure due to root growth should be removed.
- Trees that are growing on spillways that would impede drainage should be removed.
- Hazardous trees should be removed.
- Trees/shrubs that hinder accessibility to access roads should be trimmed or removed.

References

Clark County. (July 2021). *Clark County Stormwater Manual 2015 Book 4 Stormwater Facility Operation and Maintenance*. https://clark.wa.gov/sites/default/files/media/document/2021-11/CCSM%20Book%204%20Maintenance%20and%20Operations.pdf

City of Battle Ground. (March 2019). *Stormwater Facility Maintenance Manual BG02.02*. https://www.cityofbg.org/DocumentCenter/View/2100/2019-Stormwater-Facility-Maintenance-Manual-Final?bidId=

Hinman, Curtis and Wulkan, Bruce. (December 2012). *Low Impact Development Technical Guidance Manual for Puget Sound*. https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMWW/Content/Resources/DocsForDownload/References/HinmanAndWulkan2012.pdf

Hinman, Curtis. (June 2013). *Rain Garden Handbook for Western Washington: A Guide for Design, Installation, and Maintenance*. https://apps.ecology.wa.gov/publications/publications/1310027.pdf

Washington Department of Ecology. (July 2019). *Stormwater Management Manual for Western Washington*. https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMWW/2019SWMMWW.htm#Topics/FrontCover.htm?TocPath=2019%2520SWMMWW%257C_____0

Washington State. *Noxious Weed Control Board*. https://www.nwcb.wa.gov/

Washington State Legislature. (1974). *Revised Code of Washington (RCW)*. https://apps.leg.wa.gov/RCW/default.aspx

Washington State Legislature. (2004). *Washington Administrative Code (WAC)*. https://app.leg.wa.gov/WAC/default.aspx

Washington State Recreation and Conservation Office. *Washington Invasive Species Council*. https://invasivespecies.wa.gov/

APPENDIX E

Stormwater Pollution Prevention Plan

Stormwater Pollution Prevention Plan

For
The Landing at Green Mountain 2

Prepared For
Pacific Lifestyle Homes
11815 NE 99st St
Vancouver, WA 98682

Owner	Developer	Operator/Contractor
Emmert Family III LLC	Pacific Lifestyle Homes	Unknown
10470 SE Hillcrest Dr	11815 NE 99st St	
Happy Valley, OR 97086	Vancouver, WA 98682	

Project Site Location
22111 NE 28th St,
Camas WA, 98607
Parcel #173210000, 173177000

SWPPP Prepared By
PLS Engineering, Inc.
604 W Evergreen Blvd
Vancouver, WA 98660
(360) 944-6519

SWPPP Preparation Date
July 2025

Approximate Project Construction Dates
October 2025

Exhibit 17 SUB25-1006

Contents

1.0 Introduction....5

2.0 Site Description....7

2.1 Existing Conditions....7
2.2 Proposed Construction Activities....7

3.0 Construction Stormwater BMPs....9

3.1 The 13 BMP Elements....9
3.1.1 Element #1 – Mark Clearing Limits....9
3.1.2 Element #2 – Establish Construction Access....9
3.1.3 Element #3 – Control Flow Rates....10
3.1.4 Element #4 – Install Sediment Controls....10
3.1.5 Element #5 – Stabilize Soils....11
3.1.6 Element #6 – Protect Slopes....12
3.1.7 Element #7 – Protect Drain Inlets....12
3.1.8 Element #8 – Stabilize Channels and Outlets....13
3.1.9 Element #9 – Control Pollutants....13
3.1.10 Element #10 – Control Dewatering....15
3.2 Site Specific BMPs....15
3.3 Additional Advanced BMPs....15

4.0 Construction Phasing and BMP Implementation....17

5.0 Pollution Prevention Team....19

5.1 Roles and Responsibilities....19
5.2 Team Members....19

6.0 Site Inspections and Monitoring....21

6.1 Site Inspection....21
6.1.1 Site Inspection Frequency....21
6.1.2 Site Inspection Documentation....21
6.2 Stormwater Quality Monitoring....22
6.2.1 Turbidity Sampling....22

7.0 Reporting and Recordkeeping....25

7.1 Recordkeeping....25
7.1.1 Site Log Book....25
7.1.2 Records Retention....25
7.1.3 Access to Plans and Records....25
7.1.4 Updating the SWPPP....25
7.2 Reporting....26
7.2.1 Discharge Monitoring Reports....26

Exhibit 17 SUB25-1006

7.2.2 Notification of Noncompliance 26
Appendix A – Site Plans.....27
Appendix B – Construction BMPs 29
Appendix C – Alternative BMPs.....31
Appendix D – General Permit 33
Appendix E – Site Inspection Forms (and Site Log).....35
Appendix F – Engineering Calculations.....44

Appendix A Site plans

- Vicinity map (with all discharge points)
- Site plan with TESC measures

Appendix B Construction BMPs

- Possibly reference in BMPs, but likely it will be a consolidated list so that the applicant can photocopy from the list from the SWMMWW.

Appendix C Alternative Construction BMP list

- List of BMPs not selected, but can be referenced if needed in each of the 12 elements

Appendix D General Permit

Appendix E Site Log and Inspection Forms

Appendix F Engineering Calculations

1.0 Introduction

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the Landing at Green Mountain 2 construction project in Camas, Washington. The site is located on Parcels 173177000 and 173210000. Current address for the site is 22111 NE 28th Street, Camas, WA 98607 and the existing site is approximately 9.595 acres. Current proposed development associated with this SWPPP includes the construction of 34 single family lots along with the associated infrastructure. The stormwater plan associated with this project provides for stormwater management of all runoff from the site using a detention pond at the south end of the site. Stormwater runoff from the pollution generating surfaces will be treated by a ConTech media cartridge in a vault before being infiltrated.

Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of an detention pond to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV. The purpose of this SWPPP is to describe the proposed construction activities and all temporary and permanent erosion and sediment control (TESC) measures, pollution prevention measures, inspection/monitoring activities, and recordkeeping that will be implemented during the proposed construction project. The objectives of the SWPPP are to:

1. Implement Best Management Practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.

2. Prevent violations of surface water quality, ground water quality, or sediment management standards.

3. Prevent, during the construction phase, adverse water quality impacts including impacts on beneficial uses of the receiving water by controlling peak flow rates and volumes of stormwater runoff at the Permittee's outfalls and downstream of the outfalls.

This SWPPP was prepared using the Ecology SWPPP Template downloaded from the Ecology website. This SWPPP was prepared based on the requirements set forth in the Construction Stormwater General Permit and the *Stormwater Management Manual for Western Washington* (SWMMWW). The report is divided into seven main sections with several appendices that include stormwater related reference materials. The topics presented in the each of the main sections are:

- Section 1 – INTRODUCTION. This section provides a summary description of the project, and the organization of the SWPPP document.

- Section 2 – SITE DESCRIPTION. This section provides a detailed description of the existing site conditions, proposed construction activities, and calculated stormwater flow rates for existing conditions and post–construction conditions.

- Section 3 – CONSTRUCTION BMPs. This section provides a detailed description of the BMPs to be implemented based on the 12 required elements of the SWPPP (SWMMEW 2004).

- Section 4 – CONSTRUCTION PHASING AND BMP IMPLEMENTATION. This section provides a description of the timing of the BMP implementation in relation to the project schedule.

- Section 5 – POLLUTION PREVENTION TEAM. This section identifies the appropriate contact names (emergency and non-emergency), monitoring personnel, and the onsite temporary erosion and sedimentation control inspector

- Section 6 – INSPECTION AND MONITORING. This section provides a description of the inspection and monitoring requirements such as the parameters of concern to be monitored, sample locations, sample frequencies, and sampling methods for all stormwater discharge locations from the site.

- Section 7 – RECORDKEEPING. This section describes the requirements for documentation of the BMP implementation, site inspections, monitoring results, and changes to the implementation of certain BMPs due to site factors experienced during construction.

Supporting documentation and standard forms are provided in the following Appendices:

Appendix A – Site plans
Appendix B – Construction BMPs
Appendix C – Alternative Construction BMP list
Appendix D – General Permit
Appendix E – Site Log and Inspection Forms
Appendix F – Engineering Calculations

2.0 Site Description

2.1 Existing Conditions

Current Addresses for the site is 22111 NE 28th Street, Camas, WA 98607. The site is approximately 9.595 acres. The property's topography is moderately sloped from a high point at the NE corner of the site to a low point at the SW corner of the site. The site has an existing house, several manufactured homes, a shop, and Chicken coop which will be removed. The remaining area consists of grass, trees, and brush.

The soils are mapped by the NRCS as Lauren gravelly loam (LgB) in the NE corner and South edge of the site, McBee silt Loam (MIA) on the West edge of the site, and Lauren loam (LeB) in the East end of the site.

2.2 Proposed Construction Activities

The project proposes to develop the parcel into 34 single family lots and associated access. Construction activities will include excavation, grading, construction of paving and sidewalk to serve the site, construction of an detention pond to mitigate for impacts to stormwater runoff from the new paving, and installation of utilities to serve the site including sanitary sewer, storm sewer, potable water, electrical, phone, and cable TV.

Temporary erosion and sediment control facilities will be installed prior to site construction to handle construction-phase stormwater runoff. The schedule and phasing of BMPs during construction is provided in Section 4.0.

Stormwater runoff has been calculated using Western Washington Hydrology Model (WWHM). The detention pond was designed to contain and release all runoff generated by the site. ConTech™ vaults will be used to treat runoff before conveying it to detention pond.

After the site has been graded and all new utilities are installed, the building construction will commence. Trees will also be planted in the landscape areas noted in the Landscape Plan. Temporary seeding will occur over the lots to establish vegetative cover until such time as individual buildings are developed and permanent landscaping occurs.

Exhibit 17 SUB25-1006

3.0 Construction Stormwater BMPs

3.1 The 13 BMP Elements

3.1.1 Element #1 – Mark Clearing Limits

To protect adjacent properties and to reduce the area of soil exposed to construction, the limits of construction will be clearly marked before land-disturbing activities begin. Trees that are to be preserved, as well as all sensitive areas and their buffers, shall be clearly delineated, both in the field and on the plans. In general, natural vegetation and native topsoil shall be retained in an undisturbed state to the maximum extent possible. The BMPs relevant to marking the clearing limits that will be applied for this project include:

- Preserving Native Vegetation (BMP C101)
- Silt Fence (BMP C233)

Alternate BMPs for marking clearing limits are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.2 Element #2 – Establish Construction Access

Construction access or activities occurring on unpaved areas shall be minimized, yet where necessary, access points shall be stabilized to minimize the tracking of sediment onto public roads, and wheel washing, street sweeping, and street cleaning shall be employed to prevent sediment from entering state waters. All wash wastewater shall be controlled on site. The specific BMPs related to establishing construction access that will be used on this project include:

- Stabilized Construction Entrance (BMP C105)

Alternate construction access BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

Exhibit 17 SUB25-1006

3.1.3 Element #3 – Control Flow Rates

In order to protect the properties and waterways downstream of the project site, stormwater discharges from the site will be controlled. The specific BMPs for flow control that shall be used on this project include:

- Detention Ponds (BMP D.1)

Alternate flow control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, the project must comply with Minimum Requirement 7 (Ecology 2005).

In general, discharge rates of stormwater from the site will be controlled where increases in impervious area or soil compaction during construction could lead to downstream erosion, or where necessary to meet local agency stormwater discharge requirements (e.g. discharge to combined sewer systems).

3.1.4 Element #4 – Install Sediment Controls

All stormwater runoff from disturbed areas shall pass through an appropriate sediment removal BMP before leaving the construction site or prior to being discharged to an infiltration facility. The specific BMPs to be used for controlling sediment on this project include:

- Silt Fence (BMP C233)
- Storm Drain Inlet Protection (BMP C220)

Silt fencing and storm drain inlet protection will be adequate for sediment control during summer months. Alternate sediment control BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

In addition, sediment will be removed from paved areas in and adjacent to construction work areas manually or using mechanical sweepers, as needed, to minimize tracking of sediments on vehicle tires away from the site and to minimize washoff of sediments from adjacent streets in runoff.

Whenever possible, sediment laden water shall be discharged into onsite, relatively level, vegetated areas (BMP C240 paragraph 5, page 4-102).

Exhibit 17 SUB25-1006

In some cases, sediment discharge in concentrated runoff can be controlled using permanent stormwater BMPs (e.g., infiltration swales, ponds, trenches). Sediment loads can limit the effectiveness of some permanent stormwater BMPs, such as those used for infiltration or biofiltration; however, those BMPs designed to remove solids by settling (wet ponds or detention ponds) can be used during the construction phase. When permanent stormwater BMPs will be used to control sediment discharge during construction, the structure will be protected from excessive sedimentation with adequate erosion and sediment control BMPs. Any accumulated sediment shall be removed after construction is complete and the permanent stormwater BMP will be restabilized with vegetation per applicable design requirements once the remainder of the site has been stabilized.

The following BMPs will be implemented as end-of-pipe sediment controls as required to meet permitted turbidity limits in the site discharge(s). Prior to the implementation of these technologies, sediment sources and erosion control and soil stabilization BMP efforts will be maximized to reduce the need for end-of-pipe sedimentation controls.

- Construction Stormwater Filtration (BMP C251)
- Construction Stormwater Chemical Treatment (BMP C 250) (implemented only with prior written approval from Ecology).

3.1.5 Element #5 – Stabilize Soils

Exposed and unworked soils shall be stabilized with the application of effective BMPs to prevent erosion throughout the life of the project. The specific BMPs for soil stabilization that shall be used on this project include:

- Temporary and Permanent Seeding (BMP C120)
- Mulching (BMP C121)
- Nets and Blankets (BMP C122)
- Plastic Covering (BMP C123)
- Topsoiling (BMP C125)
- Surface Roughening (BMP C130)
- Dust Control (BMP C140)
- Early application of gravel base on areas to be paved

Alternate soil stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, no soils shall remain exposed and unworked for more than 7 days during the dry season (May 1 to September 30) and 2 days during the wet season (October 1 to April 30). Regardless of the time of year, all soils

shall be stabilized at the end of the shift before a holiday or weekend if needed based on weather forecasts.

In general, cut and fill slopes will be stabilized as soon as possible and soil stockpiles will be temporarily covered with plastic sheeting. All stockpiled soils shall be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.

3.1.6 Element #6 – Protect Slopes

All cut and fill slopes will be designed, constructed, and protected in a manner that minimizes erosion. The following specific BMPs will be used to protect slopes for this project:

- Temporary and Permanent Seeding (BMP C120)

Alternate slope protection BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

3.1.7 Element #7 – Protect Drain Inlets

All storm drain inlets and culverts made operable during construction or inlets near the site that could potentially receive surface runoff from the construction site shall be protected to prevent unfiltered or untreated water from entering the drainage conveyance system. However, the first priority is to keep all access roads clean of sediment and keep street wash water separate from entering storm drains until treatment can be provided. Storm Drain Inlet Protection (BMP C220) will be implemented for all drainage inlets and culverts that could potentially be impacted by sediment-laden runoff on and near the project site. The following inlet protection measures will be applied on this project:

Drop Inlet Protection

- Block and Gravel Drop Inlet Protection
- Gravel and Wire Drop Inlet Protection
- Catch Basin Filter

If the BMP options listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D), or if no BMPs are listed above but deemed necessary during construction, the Certified Erosion and Sediment Control Lead shall implement one or more of the alternative BMP inlet protection options listed in Appendix C.

3.1.8 Element #8 – Stabilize Channels and Outlets

Where site runoff is to be conveyed in channels or discharged to a stream or some other natural drainage point, efforts will be taken to prevent downstream erosion. The specific BMPs for channel and outlet stabilization that shall be used on this project include:

- Outlet Protection (BMP C209)

Alternate channel and outlet stabilization BMPs are included in Appendix C as a quick reference tool for the onsite inspector in the event the BMP(s) listed above are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the General NPDES Permit (Appendix D). To avoid potential erosion and sediment control issues that may cause a violation(s) of the NPDES Construction Stormwater permit (as provided in Appendix D), the Certified Erosion and Sediment Control Lead will promptly initiate the implementation of one or more of the alternative BMPs listed in Appendix C after the first sign that existing BMPs are ineffective or failing.

The project site is located west of the Cascade Mountain Crest. As such, all temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the expected peak 10-minute velocity of flow from a Type 1A, 10-year, 24-hour recurrence interval storm for the developed condition. Alternatively, the 10-year, 1-hour peak flow rate indicated by an approved continuous runoff simulation model, increased by a factor of 1.6, shall be used. Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent streambanks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems.

3.1.9 Element #9 – Control Pollutants

All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater. Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean, well organized, and free of debris. If required, BMPs to be implemented to control specific sources of pollutants are discussed below.

Vehicles, construction equipment, and/or petroleum product storage/dispensing:

- All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills, and to identify maintenance needs to prevent leaks or spills.
- On-site fueling tanks and petroleum product storage containers shall include secondary containment.
- Spill prevention measures, such as drip pans, will be used when conducting maintenance and repair of vehicles or equipment.
- In order to perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle.
- Contaminated surfaces shall be cleaned immediately following any discharge or spill incident.

Chemical storage:

- Any chemicals stored in the construction areas will conform to the appropriate source control BMPs listed in Volume IV of the Ecology stormwater manual. In Western WA, all chemicals shall have cover, containment, and protection provided on site, per BMPC153 for Material Delivery, Storage and Containment in SWMMWW 2005
- Application of agricultural chemicals, including fertilizers and pesticides, shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' recommendations for application procedures and rates shall be followed.

Excavation and tunneling spoils dewatering waste:

- Dewatering BMPs and BMPs specific to the excavation and tunneling (including handling of contaminated soils) are discussed under Element 10.

Demolition:

- Dust released from demolished sidewalks, buildings, or structures will be controlled using Dust Control measures (BMP C140).
- Storm drain inlets vulnerable to stormwater discharge carrying dust, soil, or debris will be protected using Storm Drain Inlet Protection (BMP C220 as described above for Element 7).
- Process water and slurry resulting from sawcutting and surfacing operations will be prevented from entering the waters of the State by implementing Sawcutting and Surfacing Pollution Prevention measures (BMP C152).

Concrete and grout:

- Process water and slurry resulting from concrete work will be prevented from entering the waters of the State by implementing Concrete Handling measures (BMP C151).

Sanitary wastewater:

- Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.
- Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system or to the sanitary sewer as part of Wheel Wash implementation (BMP C106).

Solid Waste:

- Solid waste will be stored in secure, clearly marked containers.

Other:

- Other BMPs will be administered as necessary to address any additional pollutant sources on site.

The facility does not require a Spill Prevention, Control, and Countermeasure (SPCC) Plan under the Federal regulations of the Clean Water Act (CWA).

3.1.10 Element #10 – Control Dewatering

3.1.13 Element #13 – Protect Low Impact Development BMPs

- Protect all bioretention and rain garden BMP's from sedimentation through installation and maintenance of erosion control BMP's on portions of the site that drain into them. Restore the BMP's to their fully functioning condition if they accumulate sediment during construction. Restoring the BMP must include removal of sediment and any sediment-laden bioretention/ rain garden soils, and replacing the removed soils with soils meeting the design specification.
- Prevent compacting bioretention and rain garden BMP's by excluding construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction by construction equipment.
- Control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff into permeable pavements or base materials.
- Pavements fouled with sediments or no longer passing an initial infiltration test must be cleaned using procedures from Book 4 of the manufacturer's procedures.
- Keep all heavy equipment off existing soils under LID facilities that have been excavated to final grade to retain the infiltration rate of the soils

3.2 Site Specific BMPs

Site specific BMPs are shown on the TESC Plan Sheets and Details in Appendix A. These site-specific plan sheets will be updated annually.

3.3 Additional Advanced BMPs

- The following BMPs are advanced and are only recommended if construction activities are complex enough to warrant them; or if the site has the potential for significant impacts to water quality. The following BMPs are directed at "end-of-pipe" treatment for sedimentation issues related to turbid runoff from construction sites. Effective BMPs are most often the simple BMPs and focus on the minimization of erosion before sedimentation is an issue. The following BMPs will most likely be implemented only after other BMP options are exhausted, or if the construction activity is large and off-site sedimentation or turbid runoff occurs or is inevitable.
- For BMP 250, written pre-approval, through Ecology is required (see SWMMWW 2005):
- BMP C250: Construction Stormwater Chemical Treatment
- BMP C251: Construction Stormwater Filtration.

4.0 Construction Phasing and BMP Implementation

The BMP implementation schedule will be driven by the construction schedule. The following provides a sequential list of the proposed construction schedule milestones and the corresponding BMP implementation schedule. The list contains key milestones such as wet season construction.

The BMP implementation schedule listed below is keyed to proposed phases of the construction project and reflects differences in BMP installations and inspections that relate to wet season construction. The project site is located west of the Cascade Mountain Crest. As such, the dry season is considered to be from May 1 to September 30 and the wet season is considered to be from October 1 to April 30.

- Estimate of Construction start date: 10/01/22
- Estimate of Construction finish date: 9/06/25
- Mobilize equipment on site: 10/01/22
- Mobilize and store all ESC and soil stabilization products: 10/01/22
- Install ESC measures: 10/01/22
- Install stabilized construction entrance: 10/01/22
- Begin clearing and grubbing: 10/01/22
- Demolish existing structures: 10/01/22
- Begin site grading 10/01/22
- Site grading ends 10/30/22
- Excavate and install new utilities and services: 11/01/22
- Excavation for building foundations 10/06/22
- Begin building construction: 10/06/22
- Complete utility construction 10/06/22
- Begin implementing soil stabilization and sediment control BMPs throughout the site in preparation for wet season: 10/06/22
- Wet Season starts: 11/01/22
- Site inspections and monitoring conducted weekly and for applicable rain events as detailed in Section 6 of this SWPPP: 10/01/22
- Implement Element #12 BMPs and manage site to minimize soil disturbance during the wet season: 10/01/22
- Complete road paving 11/30/22
- Building construction complete: 9/06/24
- Dry Season starts: 5/01/23

Exhibit 17 SUB25-1006

5.0 Pollution Prevention Team

5.1 Roles and Responsibilities

The pollution prevention team consists of personnel responsible for implementation of the SWPPP, including the following:

- Certified Erosion and Sediment Control Lead (CESCL) – primary contractor contact, responsible for site inspections (BMPs, visual monitoring, sampling, etc.); to be called upon in case of failure of any ESC measures.
- Resident Engineer – For projects with engineered structures only (sediment ponds/traps, sand filters, etc.): site representative for the owner that is the project's supervising engineer responsible for inspections and issuing instructions and drawings to the contractor's site supervisor or representative
- Emergency Ecology Contact – individual to be contacted at Ecology in case of emergency.
- Emergency Owner Contact – individual that is the site owner or representative of the site owner to be contacted in the case of an emergency.
- Non-Emergency Ecology Contact – individual that is the site owner or representative of the site owner than can be contacted if required.
- Monitoring Personnel – personnel responsible for conducting water quality monitoring; for most sites this person is also the Certified Erosion and Sediment Control Lead.

5.2 Team Members

Names and contact information for those identified as members of the pollution prevention team are provided in the following table.

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	Unknown	
Resident Engineer	Travis Johnson	(360)944-6519
Emergency Ecology Contact	Unknown	
Emergency Owner Contact	Unknown	
Non-Emergency Ecology Contact	Unknown	
Monitoring Personnel	Unknown	

Exhibit 17 SUB25-1006

6.0 Site Inspections and Monitoring

Monitoring includes visual inspection, monitoring for water quality parameters of concern, and documentation of the inspection and monitoring findings in a site log book. A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book. This SWPPP may function as the site log book if desired, or the forms may be separated and included in a separate site log book. However, if separated, the site log book but must be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

6.1 Site Inspection

All BMPs will be inspected, maintained, and repaired as needed to assure continued performance of their intended function. The inspector will be a Certified Erosion and Sediment Control Lead (CESCL) per BMP C160. The name and contact information for the CESCL is provided in Section 5 of this SWPPP.

Site inspection will occur in all areas disturbed by construction activities and at all stormwater discharge points. Stormwater will be examined for the presence of suspended sediment, turbidity, discoloration, and oily sheen. The site inspector will evaluate and document the effectiveness of the installed BMPs and determine if it is necessary to repair or replace any of the BMPs to improve the quality of stormwater discharges. All maintenance and repairs will be documented in the site log book or forms provided in this document. All new BMPs or design changes will be documented in the SWPPP as soon as possible.

6.1.1 Site Inspection Frequency

Site inspections will be conducted at least once a week and within 24 hours following any discharge from the site. For sites with temporary stabilization measures, the site inspection frequency can be reduced to once every month.

6.1.2 Site Inspection Documentation

The site inspector will record each site inspection using the site log inspection forms provided in Appendix E. The site inspection log forms may be separated from this SWPPP document, but will be maintained on-site or within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Exhibit 17 SUB25-1006

6.2 Stormwater Quality Monitoring

The construction site will comply with the requirements set forth in the 2015 Construction Stormwater General Permit (revised 2017) seen in Appendix D. A Certified Erosion and Sediment Control Lead shall be on-site or on-call at all times.

The following text describes the monitoring for the proposed development.

6.2.1 Turbidity Sampling

The receiving water body, Lacamas Creek Watershed, is impaired for turbidity. Mandatory BMPs (Best Management Practices) and erosion control practices put in place by the permit will appropriately minimize the turbidity of the stormwater discharge. Monitoring requirements for the proposed project will include weekly turbidity sampling to monitor site discharges for water quality compliance as required by the NPDES Construction Stormwater General Permit, provided that site discharges occur. It should be noted that the site is designed such that all site runoff will be infiltrated so it is likely that discharges will be rare or may not occur at all. Sampling will be conducted at all discharge points at least once per calendar week.

Turbidity sampling during construction will be completed weekly in order to confirm that erosion control measures are meeting the water quality standards for turbidity (Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharge, but has not excluded these discharges, compliance with special Conditions S4 (monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL (S8.E.1.c)). Special Conditions S4 establishes that the key benchmark values that require action are 25 NTU for turbidity (equivalent to 32 cm transparency) and 250 NTU for turbidity (equivalent to 6 cm transparency). If the 25 NTU benchmark for turbidity (equivalent to 32 cm transparency) is exceeded, the following steps will be conducted:

1. Ensure all BMPs specified in this SWPPP are installed and functioning as intended.
2. Assess whether additional BMPs should be implemented, and document revisions to the SWPPP as necessary.
3. Sample discharge location daily until the analysis results are less than 25 NTU (turbidity) or greater than 32 cm (transparency).

If the turbidity is greater than 25 NTU (or transparency is less than 32 cm) but less than 250 NTU (transparency greater than 6 cm) for more than 3 days, additional treatment BMPs will be implemented within 24 hours of the third consecutive sample that exceeded the benchmark value. Additional treatment BMPs to be considered will include, but are not limited to, off-site treatment, infiltration, filtration and chemical treatment.

If the 250 NTU benchmark for turbidity (or less than 6 cm transparency) is exceeded at any time, the following steps will be conducted:

1. Notify Ecology by phone within 24 hours of analysis (see Section 5.0 of this SWPPP for contact information).
2. Continue daily sampling until the turbidity is less than 25 NTU (or transparency is greater than 32 cm).

Exhibit 17 SUB25-1006

3. Initiate additional treatment BMPs such as off-site treatment, infiltration, filtration and chemical treatment within 24 hours of the first 250 NTU exceedance.
4. Implement additional treatment BMPs as soon as possible, but within 7 days of the first 250 NTU exceedance.
5. Describe inspection results and remedial actions taken in the site log book and in monthly discharge monitoring reports as described in Section 7.0 of this SWPPP.

In the event that Turbidity results are greater than 25 NTUs, or the site is determined to be out of compliance with surface water quality standards for turbidity, the following BMPs should be established, re-established or implemented as determined necessary by the Certified Erosion and Sediment Control lead (CESCL) in order to bring the site back into compliance:

BMP C105: Stabilized Construction Entrance / Exit (repair construction entrance as necessary)

BMP C106: Wheel Wash (repair wheel wash as necessary)

BMP C120: Temporary and permanent Seeding

BMP C124: Sodding

BMP C140: Dust Control

BMP C209: Outlet Protection

BMP C220: Storm Drain Inlet Protection (add more inlet protection, as necessary

BMP C233: Silt Fence (add more silt fencing as necessary)

Exhibit 17 SUB25-1006

7.0 Reporting and Recordkeeping

7.1 Recordkeeping

7.1.1 Site Log Book

A site log book will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements;
- Site inspections; and,
- Stormwater quality monitoring.

For convenience, the inspection form and water quality monitoring forms included in this SWPPP include the required information for the site log book.

7.1.2 Records Retention

Records of all monitoring information (site log book, inspection reports/checklists, etc.), this Stormwater Pollution Prevention Plan, and any other documentation of compliance with permit requirements will be retained during the life of the construction project and for a minimum of three years following the termination of permit coverage in accordance with permit condition S5.C.

7.1.3 Access to Plans and Records

The SWPPP, General Permit, Notice of Authorization letter, and Site Log Book will be retained on site or within reasonable access to the site and will be made immediately available upon request to Ecology or the local jurisdiction. A copy of this SWPPP will be provided to Ecology within 14 days of receipt of a written request for the SWPPP from Ecology. Any other information requested by Ecology will be submitted within a reasonable time. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with permit condition S5.G.

7.1.4 Updating the SWPPP

In accordance with Conditions S3, S4.B, and S9.B.3 of the General Permit, this SWPPP will be modified if the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site or there has been a change in design, construction, operation, or maintenance at the site that has a significant effect on the discharge, or potential for discharge, of pollutants to the waters of the State. The SWPPP will be modified within seven days of determination based on inspection(s) that additional or modified BMPs are necessary to correct problems identified, and an updated timeline for BMP implementation will be prepared.

Exhibit 17 SUB25-1006

7.2 Reporting

7.2.1 Discharge Monitoring Reports

Discharge Monitoring Reports (DMRs) will be submitted to Ecology monthly. If there was no discharge during a given monitoring period, the Permittee shall submit the form as required, with the words "No discharge" entered in the place of monitoring results. The DMR due date is 15 days following the end of each month.

Water quality sampling results will be submitted to Ecology monthly on Discharge Monitoring Report (DMR) forms in accordance with permit condition S5.B. If there was no discharge during a given monitoring period, the form will be submitted with the words "no discharge" entered in place of the monitoring results. If a benchmark was exceeded, a brief summary of inspection results and remedial actions taken will be included. If sampling could not be performed during a monitoring period, a DMR will be submitted with an explanation of why sampling could not be performed.

7.2.2 Notification of Noncompliance

If any of the terms and conditions of the permit are not met, and it causes a threat to human health or the environment, the following steps will be taken in accordance with permit section S5.F:

1. Ecology will be immediately notified of the failure to comply.
2. Immediate action will be taken to control the noncompliance issue and to correct the problem. If applicable, sampling and analysis of any noncompliance will be repeated immediately and the results submitted to Ecology within five (5) days of becoming aware of the violation.
3. A detailed written report describing the noncompliance will be submitted to Ecology within five (5) days, unless requested earlier by Ecology.

Any time turbidity sampling indicates turbidity is 250 nephelometric turbidity units (NTU) or greater or water transparency is 6 centimeters or less, the Ecology regional office will be notified by phone within 24 hours of analysis as required by permit condition S5.A (see Section 5.0 of this SWPPP for contact information).

In accordance with permit condition S2.A, a complete application form will be submitted to Ecology and the appropriate local jurisdiction (if applicable) to be covered by the General Permit.

Appendix A – Site Plans

Appendix B – Construction BMPs

Stabilized Construction Entrance (BMP C105)

Silt Fence (BMP C233)

Storm Drain Inlet Protection (BMP C220)

Detention Pond (BMP D.1)

Temporary and Permanent Seeding (BMP C120)

Mulching (BMP C121)

Nets and Blankets (BMP C122)

Plastic Covering (BMP C123)

Topsoiling (BMP C125)

Dust Control (BMP C140)

Early application of gravel base on areas to be paved

Outlet Protection (BMP C209)

Appendix C – Alternative BMPs

The following includes a list of possible alternative BMPs for each of the 12 elements not described in the main SWPPP text. This list can be referenced in the event a BMP for a specific element is not functioning as designed and an alternative BMP needs to be implemented.

Element #1 - Mark Clearing Limits
High Visibility Plastic or Metal Fence (BMP C103)
Stake and Wire Fence (BMP C104)
Element #2 - Establish Construction Access
Wheel Wash (BMP C106)
Water Bars (BMP C203)
Element #3 - Control Flow Rates
Wattles (BMP C235)

Element #4 - Install Sediment Controls
Straw Bale Barrier (BMP C230)
Gravel Filter Berm (BMP C232)
Straw Wattles (BMP C235)
Portable Water Storage Tanks (Baker Tanks)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #5 - Stabilize Soils
Polyacrylamide (BMP C126)

Element #6 - Protect Slopes
Straw Wattles (BMP C235)
Surface Roughening (BMP C240)

Element #8 - Stabilize Channels and Outlets
Level Spreader (BMP C206)
Check Dams (BMP C207)

Element #9 – Control Pollutants
Concrete Handling (BMP C151)
Construction Stormwater Chemical Treatment (BMP C250)
Construction Stormwater Filtration (BMP C251)

Element #10 - Control Dewatering
Vegetated Filtration (BMP C236)
Additional Advanced BMPs to Control Dewatering:

Appendix D – General Permit

Exhibit 17 SUB25-1006

Appendix E – Site Inspection Forms (and Site Log)

The results of each inspection shall be summarized in an inspection report or checklist that is entered into or attached to the site log book. It is suggested that the inspection report or checklist be included in this appendix to keep monitoring and inspection information in one document, but this is optional. However, it is mandatory that this SWPPP and the site inspection forms be kept onsite at all times during construction, and that inspections be performed and documented as outlined below.

At a minimum, each inspection report or checklist shall include:

a. Inspection date/times

b. Weather information: general conditions during inspection, approximate amount of precipitation since the last inspection, and approximate amount of precipitation within the last 24 hours.

c. A summary or list of all BMPs that have been implemented, including observations of all erosion/sediment control structures or practices.

d. The following shall be noted:

   i. locations of BMPs inspected,

   ii. locations of BMPs that need maintenance,

   iii. the reason maintenance is needed,

   iv. locations of BMPs that failed to operate as designed or intended, and

   v. locations where additional or different BMPs are needed, and the reason(s) why

e. A description of stormwater discharged from the site. The presence of suspended sediment, turbid water, discoloration, and/or oil sheen shall be noted, as applicable.

f. A description of any water quality monitoring performed during inspection, and the results of that monitoring.

g. General comments and notes, including a brief description of any BMP repairs, maintenance or installations made as a result of the inspection.

h. A statement that, in the judgment of the person conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the SWPPP and the NPDES permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions required to bring the site back into compliance, as well as a schedule of implementation.

i. Name, title, and signature of person conducting the site inspection; and the following statement: "I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief".

When the site inspection indicates that the site is not in compliance with any terms and conditions of the NPDES permit, the Permittee shall take immediate action(s) to: stop, contain, and clean up the unauthorized discharges, or otherwise stop the noncompliance; correct the problem(s); implement appropriate Best Management Practices (BMPs), and/or conduct maintenance of existing BMPs; and achieve compliance with all applicable standards and permit conditions. In addition, if the noncompliance causes a threat to human health or the environment, the Permittee shall comply with the Noncompliance Notification requirements in Special Condition S5.F of the permit.

Site Inspection Form

General Information			
Project Name:			
Inspector Name:		**Title:**	
		CESCL # :	
Date:		**Time:**	
Inspection Type:	□ After a rain event □ Weekly □ Turbidity/transparency benchmark exceedance □ Other		
Weather			
Precipitation	Since last inspection	In last 24 hours	
Description of General Site Conditions:			

Inspection of BMPs							
Element 1: Mark Clearing Limits							
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
	Y	N		Y	N	NIP	
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
	Y	N		Y	N	NIP	
Element 2: Establish Construction Access							
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
	Y	N		Y	N	NIP	
BMP:							
Location	Inspected			Functioning			Problem/Corrective Action
	Y	N		Y	N	NIP	

Element 3: Control Flow Rates								
BMP:								
Location	Inspected			Functioning			Problem/Corrective Action	
	Y	N		Y	N	NIP		
BMP:								
Location	Inspected			Functioning			Problem/Corrective Action	
	Y	N		Y	N	NIP		

Element 4: Install Sediment Controls								
BMP:								
Location	Inspected			Functioning			Problem/Corrective Action	
	Y	N		Y	N	NIP		
BMP:								
Location	Inspected			Functioning			Problem/Corrective Action	
	Y	N		Y	N	NIP		
BMP:								
Location	Inspected			Functioning			Problem/Corrective Action	
	Y	N		Y	N	NIP		
BMP:								
Location	Inspected			Functioning			Problem/Corrective Action	
	Y	N		Y	N	NIP		

Element 5: Stabilize Soils

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 6: Protect Slopes

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 7: Protect Drain Inlets

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 8: Stabilize Channels and Outlets

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

BMP:

Location	Inspected Y	Inspected N	Functioning Y	Functioning N	Functioning NIP	Problem/Corrective Action

Element 9: Control Pollutants						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
Element 10: Control Dewatering						
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	
BMP:						
Location	Inspected		Functioning			Problem/Corrective Action
	Y	N	Y	N	NIP	

Stormwater Discharges From the Site		
	Observed?	Problem/Corrective Action

	Y	N
Location		
Turbidity		
Discoloration		
Sheen		
Location		
Turbidity		
Discoloration		
Sheen		

Water Quality Monitoring

Was any water quality monitoring conducted? □ Yes □ No

If water quality monitoring was conducted, record results here:

If water quality monitoring indicated turbidity 250 NTU or greater; or transparency 6 cm or less, was Ecology notified by phone within 24 hrs?

□ Yes □ No

If Ecology was notified, indicate the date, time, contact name and phone number below:

Date:
Time:
Contact Name:
Phone #:

General Comments and Notes

Include BMP repairs, maintenance, or installations made as a result of the inspection.

Were Photos Taken? □ Yes □ No

If photos taken, describe photos below:

Appendix F – Engineering Calculations

Engineering calculations provided in Appendix B of the Technical Information Report

APPENDIX F

Environmental Documentation

CRITICAL AREAS REPORT

& MITIGATION PLAN

Project:

The Landing at Green Mountain – Phase II

Applicant:

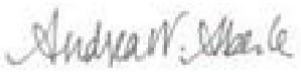
Pacific Lifestyle Homes
11815 NE 99th Street,
Vancouver WA, 98682

Prepared By:

Ash ECO SOLUTIONS, LLC

July 1, 2025

The information in this report was compiled to meet the requirements of the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. This report has been prepared under the supervision and direction of the undersigned, a qualified professional following CMC Section 16.61.020.A.



Andrea W. Aberle, Sr. Biologist
AshEco Solutions, LLC

SITE INFORMATION:

Parcel No(s):	173177000
Acreage:	4.83 acres
Local Jurisdiction:	City of Camas, Washington
Section/Township/Range:	SW¼, S21, T2N, R3E, W.M.
Site Address:	22111 NE 28th Street Camas, WA 98607
Legal Landowner:	Emmert Family III LLC *(Per Current GIS Parcel Info)*

Parcel No(s):	173210000
Acreage:	4.91 acres
Local Jurisdiction:	City of Camas, Washington
Section/Township/Range:	SW¼, S21, T2N, R3E, W.M.
Site Address:	22015 NE 28th Street Camas, WA 98607
Legal Landowner:	Linda Middagh *(Per Current GIS Parcel Info)*

TABLE OF CONTENTS

INTRODUCTION 1
Project Description 1
Project Location and Background Information 1
EXISTING CONDITIONS 1
CRITICAL AREAS MAP RESEARCH 1
Topography 1
Soil Survey 1
Wetlands 2
WDFW Priority Habitat 2
METHODOLOGY 3
Wetlands 3
WDFW Priority Habitat 3
Habitats of Local Importance 4
DOCUMENTED VEGETATION 4
CRITICAL AREA CONCLUSIONS 5
Wetlands 5
Wetland Buffers 5
WETLAND BUFFER MITIGATION PLAN 6
Avoidance & Minimization 6
Wetland conclusions 7
WDFW PRIORITY HABITAT 7
Habitats of Local Importance 7
OREGON WHITE OAK MITIGATION PLAN 8
Avoidance and Minimization 8
OAK MITIGATION PLANTING PLAN 10
Site Preparation 10
Planting Methods 10
Planting Specifications 10
Protective Signage 11
Maintenance Plan 11
Monitoring Plan 11
Monitoring Report Contents 12
Contingency Plan 12

Site Protection **12**

MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS **12**

DISCLAIMER **13**

REFERENCES **14**

TABLES

Table 1. Critical Areas Summary 5
Table 2. Wetland Buffer Impacts and Mitigation Summary 7
Table 3. Oregon White Oak Summary 8
Table 4. Oak Impacts & Mitigation Summary 10
Table 5. Oak Mitigation Planting Plan 11

FIGURE SET

Figure 1 – Vicinity Map
Figure 2 – Aerial Photo & Topography Map
Figure 3 – Soil Survey & National Wetlands Inventory (NWI) Map
Figure 4 – Riparian Habitat & Species Map
Figure 5 – Washington Dept. of Fish & Wildlife (WDFW) Priority Habitat & Species (PHS) Map
Figure 6 – Existing & Proposed Conditions Map

APPENDICES

Appendix A – Site Photos
Appendix B – Wetland Rating Forms
Appendix C – Tree Plan (Arbor Science Tree Care, June 2025)

INTRODUCTION

Project Description

AshEco Solutions, LLC (AES) was contracted by Pacific Lifestyle Homes (PLH) to assess the potential critical areas located within a study area comprised of two subject parcels and areas immediately offsite to the south. This Critical Areas Report and Buffer Plan follows the City of Camas Municipal Code (CMC) Sections 16.53 Wetlands and 16.61 Fish and Wildlife Habitat Conservation Areas. PLH proposes construction of a residential subdivision within two parcels of land totaling 9.74-acres. The existing single-family residences located near NE 28th Avenue will remain and are not part of the proposed project.

Project Location and Background Information

The study area consists of two subject parcels addressed as 22111 NE 28th Street and 22015 NE 28th Street, Camas, Washington (Figure 1). The parcels are under the jurisdiction of the City of Camas and are assigned Parcel Numbers 173177000 and 173210000. East of the subject parcels is The Landing at Green Mountain – Phase I residential subdivision. To the west are large lot residential properties. To the north , north of NE 28th are urban residential lots and south of the property is forest park land owned by Clark County.

EXISTING CONDITIONS

The topography onsite and within the vicinity of the study area, slopes in elevation from the highest point along NE 28th Street in the north to the south/southwest. Seasonal hydrology ultimately flows offsite and southwest to the valley floor to the Lacamas Creek corridor. A maintained overhead BPA powerline easement that is 100 feet in width bisects the study area diagonally east/west.

Since at least the 1970s both subject parcels within the study area have had single-family residential use in the north and agricultural uses in the central and southern areas. The study area is generally dominated by open pasture areas with scattered native and non-native trees. Little native understory exists within the bulk of the study area due to a history of grazing of the open pastures and maintained lawn present surrounding the residences. Trees that are concentrated within the study area are located in the vicinity of the southern parcel boundaries, adjacent to forest land owned by Clark County. It should be noted that a series of trails and a maintained access/logging road is present to the south on the county property with connection ultimately south to Lacamas Lake and Camp Currie park lands.

CRITICAL AREAS MAP RESEARCH

Topography

The localized topography as depicted by Clark County GIS generally depicts a south facing slope on a terrace above the Lacamas Creek valley. The topography elevation contours mapped indicate that elevations drop approximately 50 feet from the highest elevation near NE 28th Street in the north to the lowest elevation in the southwest corner of Parcel 173210000 (Figure 2).

Soil Survey

Soils within the subject parcel are mapped by the NRCS USDA Soil Conservation Service, Soil Survey of Clark County Washington (1972), as Lauren gravelly loam, 0 to 8 percent slopes (LgB), Lauren loam, 0 to 8 percent slopes (LeB), and McBee silt loam, 0 to 3 percent slopes (MIA) (Figure 3).

The Lauren series consists of deep, somewhat excessively drained, nearly level to gently sloping soils on terraces 50 to 300 feet above the Columbia River. In a few places, on terrace fronts, the soils are steep to very steep. These are very gravelly soils that formed in mixed Columbia River alluvium that contained some

volcanic ash. Typically, native vegetation occurring within this soil series is comprised Douglas-fir, grand fir, bigleaf maple, vine maple, salal, and ferns.

Lauren gravelly loam, 0 to 8 percent slopes (LgB) occurs on terraces. The slopes are generally less than 4 percent and approach 8 percent only along the terrace breaks. In a typical profile the surface layer is very dark brown gravelly and very gravelly loam about 20-inches thick. Below the surface layer is friable, dark- brown very gravelly loam about 13-inches thick. The next layer is dark-brown very gravelly coarse sandy loam about 11-inches thick. The underlying material, to a depth of 70-inches, is dark-brown very gravelly loamy coarse sand. Included in mapping were a few small areas where very gravelly loamy coarse sand is within 30-inches of the surface. Permeability generally is moderately rapid, but it is rapid in the substratum. The available water capacity is moderate. Surface runoff is slow, and the erosion hazard is slight. The LgB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Lauren loam, 0 to 8 percent slopes (LeB) is similar to Lauren gravelly loam, 0 to 8 percent slopes, except that the surface layer is free of gravel. Surface runoff is slow, and the erosion hazard is slight. Included in mapping were a few small gravelly areas. The LeB soil type is not listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

The McBee series consists of deep, somewhat poorly drained and moderately well drained, nearly level to gently sloping soils. These are loamy soils in back-bottom positions along streams and rivers. They formed in alluvium derived from quartzite and basalt. Typically, native vegetation is western redcedar, hemlock, vine maple, red alder, Oregon ash, wild rose, spirea, willow, blackberry, grasses, and sedges.

McBee silt loam, 0 to 3 percent slopes (MlA), occurs in drainageways and depressions, and in most places the slope is less than 1 percent. In a typical profile the surface layer is mottled, very dark brown silt loam about 11 inches thick. Below the surface layer is friable, mottled, dark-brown heavy loam about 8 inches thick. The next layer, to a depth of 44 inches, is mottled, very dark grayish-brown gravelly sandy loam. Below this, to a depth of 62 inches, is dark-brown very gravelly loamy sand. Typically, there is no erosion hazard with this soil type. This soil is somewhat poorly drained, surface runoff is very slow, with water standing on the surface much of the winter in undrained areas. The MlA soil type is listed on the Washington State Hydric Soils List for Clark County (NRCS 2022).

Mapped hydric soils do not necessarily mean that the area is a wetland; hydrology and wetland vegetation must be present to classify an area as a wetland. The same is true for soils that are not mapped as hydric. Wetlands can be found in areas without mapped hydric soils.

Wetlands

Clark County GIS Maps Online does not map wetland presence within the study area, nor does the National Wetland Inventory (NWI) (Figure 3). AshEco Solutions (AES) reconnaissance of the subject parcels confirmed that wetlands are not located within the subject parcels as indicated by Clark County GIS and NWI mapping.

WDFW Priority Habitat

Clark County GIS and the Washington Department of Fish and Wildlife (WDFW) map individual Oregon white oak trees within and adjacent to the subject parcels (Figures 4 and 5). AES identified three individual Oregon white oak trees onsite, one within the far northeast corner of the study area and two in the far southeast corner (Figure 6).

WDFW also indicates that “Cave or Cave-rich Areas” occur within the general area surrounding the subject

parcels, though no evidence of caves or rock outcroppings were identified onsite by AES during site reconnaissance.

METHODOLOGY

Wetlands

The study area and immediate offsite vicinity was evaluated for the presence of wetlands using the Routine Determination Method per the U.S. Army Corps of Engineers' (USACE's) *Wetland Delineation Manual* (1987), the *Washington State Wetlands Identification and Delineation Manual* (1997), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, Version 2.0* (USACE 2010). The Routine Determination Method examines three parameters to determine if wetlands exist in a given area: vegetation, hydrology, and soils. The presence of hydrology is critical in identifying wetlands; however, since hydrologic conditions can change periodically (hourly, daily, or seasonally), it is necessary to determine if hydrophytic vegetation and hydric soils are also present. By definition, wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are regulated as "Waters of the United States" by the USACE, "Waters of the State" by Washington State Department of Ecology (ECY), and locally by CMC section 16.53 Wetlands.

AES did not identify wetlands within the study area. However, AES did perform reconnaissance offsite from the southern study area limits (for this project and an adjacent project) and identified a forested wetland unit (Potential Wetland #3) offsite to the southwest. Using aerial imagery AES approximated two additional offsite wetlands west of the site (Figure 6). These approximate wetland limits are presented by this report following CMC 16.53.030(B)(2).

WDFW Priority Habitat

The WDFW PHS system maps individual Oregon white oak trees onsite and adjacent to the eastern subject parcel. AES inventoried the Oregon white oaks present onsite.

WDFW defines Oregon white oak Priority Habitat as; Oregon White Oak Woodlands are "*stands of oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%; or where total canopy coverage of the stand is <25%, but oak accounts for at least 50% of the canopy coverage. The latter is often referred to as oak savanna. In non-urbanized areas west of the Cascades, priority oak habitat consists of stands > 0.4 ha (1.0 ac) in size. East of the Cascades, priority oak habitat consists of stands > 2 ha (5 ac) in size. In urban or urbanizing areas, single oaks or stands < 0.4 ha (1 ac) may also be considered a priority when found to be particularly valuable to fish and wildlife (i.e., they contain many cavities, have a large diameter at breast height [dbh]* (generally 20-inches dbh and greater)*, are used by priority species, or have a large canopy). Oak woodlands in western Washington may contain understory plants indicative of Prairie*."

Individual Oregon white oak trees meeting the above definition were identified within or immediately adjacent to the subject parcel (Figure 6). The subject site is within an incorporated city and is urban, therefore the individual Oregon white oak trees are considered Priority Habitat by WDFW. The project does not propose impacts to the onsite oaks, as the project has been designed to retain all onsite oaks (Figure 6).

The WDFW PHS system maps "Cave or Cave-rich Areas" present in areas surrounding the subject parcel (Figure 5).

WDFW defines Caves as, *"A naturally occurring cavity, recess, void, or system of interconnected passages (including associated dendritic tubes, cracks, and fissures) which occurs under the earth in soils, rock, ice, or other geological formations, and is large enough to contain a human. Mine shafts (a human-made excavation in the earth usually used to extract minerals) may mimic caves and abandoned mine shafts with actual or suspected occurrences of priority species should be treated in a manner similar to caves."*

No caves or rock outcroppings meeting the above definition were identified within the study area or immediately offsite.

Habitats of Local Importance
Following CMC Chapter 16.61 - Fish And Wildlife Habitat Conservation Areas, Section: 16.61.010.A.3.a, individual Oregon white oak trees with a twenty-inch diameter at breast height (20-inches dbh), stands of Oregon white oak trees greater than one acre when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height, are used by priority species, or have a large canopy), and all Oregon white oak snags unless determined by an arborist to be a hazard, are considered Habitats of Local Importance and therefore are regulated by CMC.

DOCUMENTED VEGETATION

The vegetation onsite has been disturbed by equestrian use and historic mowing activities, with non-native and invasive grasses and herbs dominate throughout areas historically grazed within the northern and central sections of the parcel. A few individual scattered trees are present onsite including Douglas-fir (*Pseudotsuga menzisii,* FACU) and Oregon white oak (*Quercus garryana* ,FACU).

South of the subject parcel is a forested wetland mosaic area owned by Clark County. This area is much more biologically diverse and slightly overlaps with onsite areas along the southern parcel boundary and corners. Upland vegetation identified in this area includes Douglas-fir (*Pseudotsuga menzisii* FACU), Oregon white oak (*Quercus garryana* FACU), and Oregon ash (*Fraxinus latifolia* FACW) in the overstory with vine maple (*Acer circinatum* FAC), beaked hazelnut (*Corylus cornuta* FACU), snowberry (*Symphoricarpos albus* FACU), red osier dogwood (*Cornus sericea* FACW), trailing blackberry (*Rubus ursinus* FACU) and salmonberry (*Rubus spectabilis* FAC) in the shrub stratum and sword fern (*Polystichum munitum* FACU), piggy-back plant (*Tolmiea menzisii* FAC), lanceleaf spring beauty (*Claytonia lanceolata* FAC), dovefoot geranium (*Geranium mole* FACU), large leaf avens (*Geum macrophyllum* FACW), and slough sedge (*Carex obnupta* OBL) in the herbaceous stratum.

The indicator categories following the common and scientific name of each vegetation species indicate the likelihood of the species to be found in wetlands. Listed from most-likely to least-likely to be found in wetlands, the indicator categories are:

- **OBL (obligate wetland) –** Occur almost always under natural conditions in wetlands.
- **FACW (facultative wetland) –** Usually occur in wetlands but occasionally found in non-wetlands.
- **FAC (facultative) –** Equally likely to occur in wetlands or non-wetlands.
- **FACU (facultative upland) –** Usually occur in non-wetlands but occasionally found in wetlands.
- **UPL (obligate upland) –** Occur almost always under natural conditions in non-wetlands.
- **NI (no indicator) –** Insufficient data to assign to an indicator category.

CRITICAL AREA CONCLUSIONS

Wetlands

Offsite wetland reconnaissance by AES identified a high-quality forested wetland (potential wetland #3) offsite and southwest of the study area (Figure 6). Potential wetland #3 was rated under the Depressional Hydrogeomorphic Classification (HGM) and is considered a Category II wetland scoring high for habitat functions with a score of 8 (Appendix B). Potential wetland #3 has both slope and depressional HGM features. Under the Washington wetland rating system, wetlands with both slope and depressional features are rated under the depressional HGM classification. This high functioning wetland will require a buffer width that will encroach into the study area, thus it is the focus wetland for this report. See Wetland Buffer information presented below.

Using aerial imagery, AES approximated the boundaries of two potential offsite wetlands located west of the site (Figure 6). The offsite potential wetland (#1) west of the study area western boundary was rated under the Depressional HGM classification as it appears to consist of a shallow depressional area located on a gentle slope. The offsite potential wetland (2) was also rated under the Depressional HGM as it appears to consist of a depressional pond area. Both offsite potential wetlands resulted in Category III wetland ratings with low habitat function scores of 3 (Figure 6 and Appendix B). These wetlands will not require large buffers that will encroach into the study area.

Wetland Buffers

Under the Camas Municipal Code (CMC), wetland buffer widths are established by comparing the wetland rating habitat function score and overall category, and the intensity of proposed land use. Under CMC Table 16.53.040-4 residential use with density higher than 1-unit per acre is considered High Land Use Intensity (LUI). The proposed single family residential subdivision will match the current zoning, Single-Family Residential (R-7.5) of the subject parcels comprising a total of 9.74 acres. The proposed density of the subdivision meets the definition of High LUI under the CMC. Under CMC Table 16.53.040-2, Category II wetlands with a habitat function score of 8 adjacent to proposed High LUI require 260-foot buffers, 195-foot buffers for Moderate LUI, and 130-foot buffers for Low LUI. Under CMC Table 16.53.040-1, Category III wetlands with a habitat function score of 3 adjacent to proposed High LUI require 80-foot buffers.

The 260-foot buffer of the potential offsite wetland #3 encroaches over the southwestern corner of the site. The 80-foot buffer for the Category III wetlands offsite to the west (#1 and #2) will not encroach over the western boundary of the subject parcel (Figure 6).

WDFW Priority Habitat

A total of five individual Oregon white trees were identified onsite, four of them meeting the jurisdictional criteria (Figure 6, Table 3). Oregon white oaks are protected by WDFW and also jurisdictional under the local CMC habitat code. The understory and herbaceous layer associated with the onsite oak habitat is highly disturbed due to cattle grazing, mowing and areas dominated by Himalayan blackberry. The project has been designed to avoid and retain three of the four jurisdictional Oregon white oaks onsite (Figure 6).

Table 1. Critical Areas Summary.

Critical Area	Buffer Width
Offsite Wetland #3 Category II Wetland (Habitat Score: 8)	260 ft = High LUI Buffer
Individual Oregon White Oak Habitat	N/A *(See Table 3 for Oak Habitat Summary)*

WETLAND BUFFER MITIGATION PLAN

The buffer mitigation plan was developed following Camas Municipal Code CMC) Sections 16.53 Wetlands to offset the project impacts proposed and allow for no net loss of habitat functions onsite. The construction of this residential subdivision within the appropriate zoning location will provide housing for the southwest Washington market, specifically high density residential within the City of Camas where the market demand is high. The project avoids direct impacts to the highest functioning buffer habitat and oak trees while utilizing the historically impacted areas of the subject site for development (existing building footprints, parking and driveway areas, maintained yard areas, and historic agriculture fields that have been highly managed over the history of the site due to livestock use).

Avoidance & Minimization

The proposed single-family residence subdivision has been designed to avoid onsite critical areas to the extent possible while still providing a residential subdivision meeting the density and design requirements required by the City of Camas. The proposed residential lots, roadways and stormwater facility required for the subdivision have been designed to avoid onsite critical areas. Although the stormwater facility has been designed to avoid onsite critical areas, the facility requires a flow spreader outfall that will result in minor encroachment into the wetland buffer in the far southern portion of the study area. The flow spreader outfall has been designed to the minimum required for the structure, avoids direct impacts to mature vegetation, and can be mitigated for onsite for no net loss of habitat function or area for (Figure 6). Additionally, impacts from the flow spreader pipe avoid impacts to mature vegetation and are temporary.

Wetland Buffer Impacts & Mitigation

A small area of buffer impact will be unavoidable to construct the required flow spreader outfall from the stormwater facility within an adjacent area of lower elevation. To allow for the flow spreader outfall within the outer limits of the Category II wetland buffer, mitigation to offset the buffer impact is proposed. Although the offsite portions of the wetland unit provide higher buffer functions, this onsite buffer area where the flow spreader outfall is proposed is degraded and consists of monotypic pasture grasses with no significant vegetation to be impacted. The area of buffer impact imposed by the flow spreader outfall has been kept to the minimum size required and quantified to be 58 sf (Figure 6). The project proposes to offset this buffer impact area at a 1:1 ratio by buffer averaging nearby (and north of the standard 260-foot base buffer width otherwise held by the project along the southern parcel boundaries) over an area totaling 58 sf in size (Figure 6).

Temporary buffer impacts will be associated with the installation of the underground pipe that is required to connect the stormwater facility to the flow spreader outfall. A trench will be excavated within the pipe corridor and will avoid impacts to mature vegetation. The pipe trench will be back-filled with the native soils temporarily removed during construction of the pipe trench. All exposed soils from the trench and pipe installation activities will be re-vegetated using native seed mix appropriate for upland wetland buffer habitat – “Native Riparian seed mix” from Sunmark Seeds (or similar product) is recommended at the standard seeding rate of one pound per 1,000 sf.

Under CMC 16.53.050.2, wetland buffer averaging is allowed to achieve no net loss of functions when the total area contained in the buffer after averaging is no less than that contained within the buffer prior to averaging. The proposed mitigation ensures that the construction of the flow spreader outfall within a portion of the Category II buffer will results in no net loss of buffer area or functions.

Table 2. Wetland Buffer Impacts & Mitigation Summary.

Critical Area	Impact	Mitigation (Area)
260-ft Buffer Potential Offsite Wetland #3	Flow Spreader Outfall Impacts to Outer Limits of 260' Buffer **(58 sf)**	Buffer Averaging @ 1:1 Ratio **(58 sf)**

Wetland Conclusions

The above sections outline how the proposed project will meet the CMC 16.53 Wetlands. The proposed residential subdivision has been designed to avoid onsite critical areas to the full extent possible while still providing a residential subdivision meeting the density and design requirements required by the City of Camas. The proposed mitigation ensures that the construction of the flow spreader outfall within a small portion of the outer 260-foot buffer will result in no net loss of buffer area or functions.

WDFW PRIORITY HABITAT

The tree survey identified a total of five individual Oregon white oak trees onsite. These oaks were numbered and mapped by the Tree Plan (Appendix C - Arbor Science Tree Care, June 2025) and depicted on Figure 6. Four of the five oaks were found to have 20-inch diameter at breast height (dbh) trunk measurements (Oak #2, 45, 47, and 54). The fifth oak tree consists of a single tree with a 6-inch dbh trunk measurement located along the eastern parcel boundary (Oak # 28). See Figure 6 and Appendix C for the oak tree locations. The four oak trees inventoried by the tree survey with dbh measurements of 20-inches or larger are considered jurisdictional as they meet the WDFW criteria for "individual oak" Priority Habitat. Oregon white oak Priority Habitat is protected by WDFW and also jurisdictional under the local CMC habitat code. The understory and herbaceous layer associated with the onsite oak habitat is highly disturbed due to grazing or dominated by Himalayan blackberry.

Habitats of Local Importance

As stated above, four of the five individual Oregon white oak trees identified as onsite are over 20-inches dbh and therefore meet the criteria listed under CMC 16.61.010.A.3.a that defines Oregon white oak habitat of local importance:

i. Individual Oregon White Oak trees with a twenty-inch diameter at breast height (twenty inches dbh).
ii. Stands of Oregon White Oak trees greater than one acre, when they are found to be valuable to fish and wildlife (i.e., may include trees with cavities, large diameter breast height (twelve inches dbh), are used by priority species, or have a large canopy.
iii. All Oregon White Oak snags unless determined by an arborist to be a hazard.

The project proposes the removal of one of these jurisdictional Oregon white oak tree (Oak#47). Mitigation to offset the removal of this jurisdictional oak tree is proposed to meet CMC Section 16.61 Fish and Wildlife Habitat Conservation Areas code. The following mitigation plan section details the mitigation measures proposed.

Table 3. Oregon White Oak Summary.

Oak Tree #	DBH	Jurisdictional per WDFW PHS &/or CMC Local Habitats of Importance Criteria *(Individual oak tree >20" dbh)*	Proposed for Removal	Requires Mitigation
2	62"	YES	NO	NO
28	**6"**	**NO**	YES	NO
45	32"	YES	NO	NO
47	**28"**	YES	YES	**YES**
54	20"	YES	NO	NO

Note: Oak #47 will be repurposed as a woody habitat enhancement element within the onsite oak mitigation area.

OREGON WHITE OAK MITIGATION PLAN

The below mitigation plan was developed following Camas Municipal Code (CMC) Section 16.61 Fish and Wildlife Habitat Conservation Areas. The project proposes the removal of one individual oak tree (Oak #47, 28" dbh) as it is intertwined with the adjacent Oregon ash trees which are within the path of the proposed access road to the stormwater facility. The single oak tree impacts will offset onsite with oak mitigation to allow for no net loss of habitat functions onsite.

The onsite oak mitigation will consist of Oregon white oak tree and native shrub enhancement within the southern portion of the site to offset the removal of the single oak tree. The mitigation plan will also incorporate oak mitigation and native enhancement within the wetland buffer also located in the far southern extent of the project and will allow for an extension of the existing treeline in this area. The perimeter of the stormwater facility will also be planted with oak mitigation plantings, as well as the understory of the adjacent large oaks to be preserved in this area (Oak #s 45 and 54). See Figure 6.

Avoidance and Minimization

Following the mitigation sequencing requirements outlined under CMC 16.51.170, the project has avoided and minimized impacts to the full extent practicable while still meeting the required design elements for a subdivision of this size within the city limits of Camas. The unavoidable impacts have been quantified, and appropriate mitigation proposed onsite for no net loss of habitat area or function onsite.

The project has been designed to avoid direct impacts to and retain the three other jurisdictional Oregon white oak trees present onsite, two of these consisting of the largest oak trees inventoried (Oak #2, 62" dbh and Oak #45, 32" dbh), with the third Oak tree to be retained (Oak #54, 20").

Oak #2 is located in the far northeast corner of the project, Oak #45 is located in the far south/central portion of the project just north of the stormwater facility, and Oak #54 is near the eastern property boundary east of the stormwater facility. The dripline of each of these oak trees will be located, staked, and fenced prior to construction to protect the critical root mass of the tree during grading and site construction. Native shrubs will be added as understory plants within the driplines of the retained oaks in the south allowing for a vegetated habitat connection between the onsite and offsite mix oak habitat to the south.

Avoidance of the Oak tree #47 was originally attempted by the project, however it was determined that there was no reasonable location for the access road for the stormwater detention facility access road with less oak impacts. The project arborist also determined that since this oak root system and canopy of this tree are

intertwined with the adjacent Oregon ash trees (Tree #s 48, 49 & 50) that if the ash were removed, that the oak would also need to be removed as its vitality would be compromised and it would ultimately be directly impacted.

The unavoidable impact to Oak #47 is required to meet the stormwater engineering design requirements and its removal was recommended by the arborist. There is sufficient space to mitigate for this tree onsite by providing a habitat corridor extension between the on and off site oak habitat. The existing forested treeline present in the south will be extended with new oak tree installation and the historically impacted understory of the retained oak will be enhanced. Oak #47 will also be repurposed as a woody habitat element within the onsite oak mitigation area, Figure 6.

The majority of the subject parcel is historically disturbed due to cattle grazing with little to no native scrub-shrub understory habitat present onsite. There is no native understory present within the area of the jurisdictional oaks present onsite including the understory of the oak proposed for removal.

Oregon White Oak Impacts and Mitigation

The removal of the single jurisdictional Oregon white oak (Oak # 47) is unavoidable by the project to meet the City development code requirements. The oak habitat impacts were calculated by quantifying the total oak canopy habitat and function to be removed from the site.

The oak habitat mitigation was designed to follow the requirements of CMC 16.51.180 and will sufficiently offset the loss of this specific oak habitat lost onsite. The mitigation has further been designed to offset the temporal loss of the oak habitat onsite, enhance the functions of the oak habitat to be retained on site, provide greater connectivity to the oak habitat present directly offsite, and will be managed by the HOA for perpetuity to ensure maintenance and survival of the habitat into the future. Previously the onsite oak habitat was grazed by horses, which led to a decline in the overall habitat present. The oak habitat to be impacted has no native understory shrub component and the oak habitat present along the perimeter of the site is dominated by Himalayan blackberry. By removing the grazing impacts from the horses, creating, enhancing and restoring areas of the onsite habitat, the proposed mitigation will provide a higher functioning Oregon white oak habitat as the area matures than that present onsite today. Additionally, the single Oregon white oak to be removed will be repurposed within the onsite mitigation areas to provide additional enhancement by the addition of oak habitat woody elements. The total oak habitat canopy loss is 875 square feet, with 9,900 square feet of onsite mitigation proposed, providing an approximate 11:1 mitigation offset ratio, see Figure 6. This mitigation ratio is considered sufficient as it exceeds the WDFW guidance for a 10:1 mitigation ratio and the habitat provided by Oak #47 is of low habitat quality. Additionally, it should be noted that the unavoidable impacts permitted for much larger oaks at the Landing at Green Mountain – Phase I (directly to the east) were mitigated for at a mitigation ratio of 5:1.

The proposed Oregon white oak mitigation area is open and will offer plenty of sunlight and adequate canopy area for the oak trees and native shrub growth post project completion. The mitigation location will also help to provide greater connectivity for wildlife habitat, by providing shade, shelter, and food sources within the extended contiguous habitat corridor connection provided to the offsite forested and mixed oak canopy than currently present. Protection will be put in place around the perimeter of the mitigation areas during site grading and construction activities and after. Compensatory measures will need to be implemented if during construction the critical root mass of the retained oak trees are inadvertently impacted.

The mitigation proposed will offset the Oregon white oak Priority Habitat impacts onsite for no net loss of priority function or area following the CMC guidelines.

Table 4. Oak Impacts & Mitigation Summary.

Oak Label	Impact	Mitigation
Oak #47	Oregon White Oak (28-inch dbh) 875 sf Canopy Loss	Oregon white oak mitigation areas at a 11:1 Ratio (Oak tree and native shrub enhancement onsite) 9,900 sf

OAK MITIGATION PLANTING PLAN

Site Preparation

1. Demarcate the on-site "Protected Oak Habitat" (Oregon white oak retention and mitigation area boundaries) and install tree protection fencing along the proposed planting areas and the perimeter of the existing oak canopy dripline, See Figure 4.
2. Maintain this tree protective fencing for the full duration of the project construction.
3. Mow grasses, herbaceous vegetation and invasive species present within mitigation areas prior to tree installation.

Note: Excavation, fill or compaction of the native soils is not to take place within the protected oak habitat. No lawn or ornamental landscaping is to be located within the protected oak habitat.

Planting Methods

Plant in fall through early spring (October-April) at specified spacing following the planting plan.
Container/Ball and Burlap Stock

1. Dig hole using a tree shovel/auger/mini-excavator or comparable tool 16-inches wide and 4-inches deeper than the root system, scarify sides of hole to 4-inches. Remove plant from container and loosen roots with hand or score vertically on sides and bottom with knife. Set plant upright and plumb in hole so the crown is just above the finish grade. Ensure that roots are extended down entirely and do not bend upward.
2. Replace loose soil around plant and firmly compact the soil around the plant to eliminate air spaces. Do not use frozen soil for backfilling.
3. Firmly compact the soil around the planted species to eliminate air spaces.
4. Install woody mulch around the base of planted and retained Oregon white oak trees to insulate plantings, maintain moisture content of soil and reduce invasive plant competition.
5. Irrigate according to performance standards for the first three summers after planting or as site and weather conditions warrant.

Planting Specifications

Planting will begin in Winter of 2025/Spring of 2026 while onsite soils are more saturated (and stock is dormant). The following tables summarize the native plant selection, spacing, size, and quantity for the on-site mitigation area:

Table 5. Oak Mitigation Planting Plan.

Common Name	*Scientific Name*	*Stock*	*Spacing*	*Quantity*
TREES (9,900 sq. ft.)				
Oregon white oak, FACU	*Quercus garryana*	2-inch caliper	14 ft.	25
Oregon white oak, FACU	*Quercus garryana*	1-gallon container	14 ft.	25
			Total =	50
SHRUBS **(9,900 sq. ft.)**				
Tall Oregon grape, FACU	*Mahonia aquifolium*	1-gallon or 24-36" bare-root	6 ft.	50
Nootka rose, FAC	*Rosa nutkana*	1-gallon or 24-36" bare-root	6 ft.	50
Snowberry, FACU	*Symphorica rpos albus*	1-gallon or 24-36" bare-root	6 ft.	50
Ocean spray, FACU	*Holodiscus discolor*	1-gallon or 24-36" bare-root	6 ft.	50
			Total =	**200**
			Grand Total of Native Shrubs =	**250**

Protective Signage

Post construction, install permanent signs along the boundary of a "Protected Oak Habitat" meeting city standards or conditions outlined under the permit. See Objective 2, Performance Standard 2b below.

Maintenance Plan

Maintenance at the on-site mitigation area covers a minimum of 5-years and will involve removing persisting invasive plant species in addition to watering and re-installing failed species as necessary. The maintenance will include the following activities when necessary:

1. Remove and control non-native/noxious vegetation around all newly installed plants. During years 1 through 5 invasive species will be removed and suppressed as often as necessary to meet a performance standard of no greater than 20 percent cover by invasive species, measured by monitoring plots.
2. Irrigate planted species as necessary during the dry season, approximately July 1 through October 15. Irrigation is recommended to occur on a two-week cycle (minimum) during the dry season for the first three years. Water will be provided by a temporary above-ground irrigation system or a water truck.
3. Replace dead or failed Oregon white oak trees as described for the original installation to meet the minimum annual performance standard of 100% survival over the 5-year monitoring period. See Objective 1 for the full performance standards outlined by year.

Monitoring Plan

The mitigation site will be monitored for a 5-year period following project construction; monitoring will take place in years 1, 2, 3 and 5. Monitoring reports will be submitted to the City of Camas by the end of each monitored year. The goal of monitoring is to determine if the previously stated performance standards are being met. The mitigation area will be monitored once during the growing season, preferably during the same two-week period each year to better compare the data.

During the first annual monitoring event, representative monitoring plot locations and photo points will be selected within the mitigation areas and permanently marked with metal T-posts (or similar). Monitoring plot

and photo point locations will be labeled on the As-built Map and included in the annual monitoring reports.

Monitoring Report Contents

The annual monitoring reports will contain at least the following:

- Location map and as-built drawing of Oregon white oak mitigation and retention areas as depicted on Figure 5 of this mitigation plan.
- Photographs from permanent photo points (10 minimum).
- Historic description of project, including dates of Oregon white oak tree installation, current year of monitoring, and restatement of mitigation goal.
- Documentation of plant survival, cover, and overall development of the plant community from the ten established monitoring plot locations.
- Photo evidence that the protective oak habitat signage is in place and legible along the outer perimeter of the mitigation areas onsite.
- Assessment of non-native, invasive plant species and recommendations for management.
- Summary of maintenance and contingency measures proposed for the next season and those completed over the past season.

Contingency Plan

If the performance standards are not met by the fifth year following project completion, a contingency plan will be developed and implemented. All contingency actions will be undertaken only after consulting and gaining approval from the City of Camas. The applicant will be required to complete a contingency plan that describes (1) the causes of failure, (2) proposed corrective actions, (3) a schedule for completing corrective actions, and (4) whether additional maintenance and monitoring are necessary.

Site Protection

The on-site mitigation area will be owned and managed by the future Homeowners Association (HOA) Associated with the subdivision. The HOA will be responsible for managing and contracting out the annual monitoring of the on-site mitigation area (to AshEco Solutions, LLC or similar entity) for the initial 5-year monitoring period. Additionally, the HOA will be responsible for managing and contracting out the seasonal maintenance required to maintain the onsite mitigation areas in perpetuity, to ensure the onsite Oregon white oak habitat is allowed to thrive. The applicant will establish and record a permanent and irrevocable conservation covenant over the onsite mitigation areas to protect the established habitat in the future.

MITIGATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS

The mitigation goal of protecting the onsite Oregon white oak habitat for no net loss of functional habitat onsite will be met when the below objectives and performance standards are met.

Objective 1: Mitigate for 875 sf of Oregon white oak habitat with onsite oak mitigation over 9,900 sf.

Performance Standard 1a. Document the removal of invasive species within the mitigation area and install boundary protection fencing around the dripline of the retained oak trees prior to grading activities. Submit photos within the As-built to document the completion of this mitigation site preparation.

Performance Standard 1b. Document the installation of the native Oregon white oak trees, native shrub enhancement and repurposing of oak woody element (Oak #47) as specified by Figure 6 within the defined mitigation area onsite. Within 60 days of project completion, submit As-built Map and documentation to show that the mitigation plan has been implemented according to this plan, or as conditioned by permit. As-built documentation is to include; planting locations on an As-built Map, native nursery receipt showing plant species and quantities, representative photos of the mitigation area from a minimum of ten (4) established

photo point locations.

Performance Standard 1c. In Years 1-5, the Oregon white oak mitigation trees are to achieve 100-percent (100%) survival. (If dead trees are replaced to achieve the 100 percent survival rate, this performance standard will be met).

Performance Standard 1d. By Year 2, native woody shrub species within the onsite mitigation areas are to achieve ninety-percent (90%) survival of. (Native volunteer growth will count towards this cover requirement, as will the installation of new plants to offset mortality.)

Performance Standard 1e. By Year 3, native woody shrub species within the onsite mitigation areas are to achieve eighty-percent (80%) survival of native woody shrub species. (Native volunteer growth will count towards this cover requirement, as will the installation of new plants to offset mortality.)

Performance Standard 1f. By Year 5, native woody shrub species within the onsite mitigation areas are to achieve thirty percent (30%) aerial cover of native woody shrub species, or eighty percent (80%) survival. (Native volunteer growth will count towards this cover requirement, as will the installation of new plants to offset mortality.)

Performance Standard 1g. In All Years, non-native/invasive plant species will not exceed 20-percent (20%) aerial cover across the onsite mitigation area.

Objective 2: <u>Provide long-term protection for the onsite mitigation area.</u>

Performance Standard 2a. Record a conservation covenant with the City of Camas. This performance standard will be met when a copy is submitted with the As-built documentation (or prior as conditioned by the approved permit) .

Performance Standard 2b. Post permanent signage along the outer boundaries of the "Protected Oak Habitat" (oak mitigation and retention areas) . Signs are to read:

"Critical Area– Please Retain in a Natural State"

or as otherwise determined by the City of Camas permit conditions.

Signage will remain in legible condition; if they are missing or illegible, they will be replaced. This performance standard will be met when signs are documented to be in place and of good condition within the final monitoring report.

DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigator. It is correct and complete to the best of our knowledge. It should be considered a preliminary mitigation plan and used at your own risk until it has been reviewed and approved in writing by the local agency with jurisdiction over the site. AES personnel base the above listed conclusions on standard scientific methodology and best professional judgment.

REFERENCES

City of Camas Municipal Code. 2008 (Amended). Section 16.53 Wetlands.

City of Camas Municipal Code. 2008 (Amended). Section 16.61 Fish and Wildlife Habitat Conservation Areas.

Clark County Geographic Information Systems. Available at: http:/gis.clark.wa.gov/mapsonline/ [Accessed 2025].

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Online edition. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

Olson, P. & Stockdale, E. 2010. Washington State Department of Ecology: Determining the Ordinary High Water Mark on Streams in Washington State. Second Review Draft. Ecology Publication #08-06-001.

U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). 1974. Soil Survey of Clark County Area. Online document. Available at: http://websoilsurvey.nrcs.usda.gov/app/. [Accessed 2025]

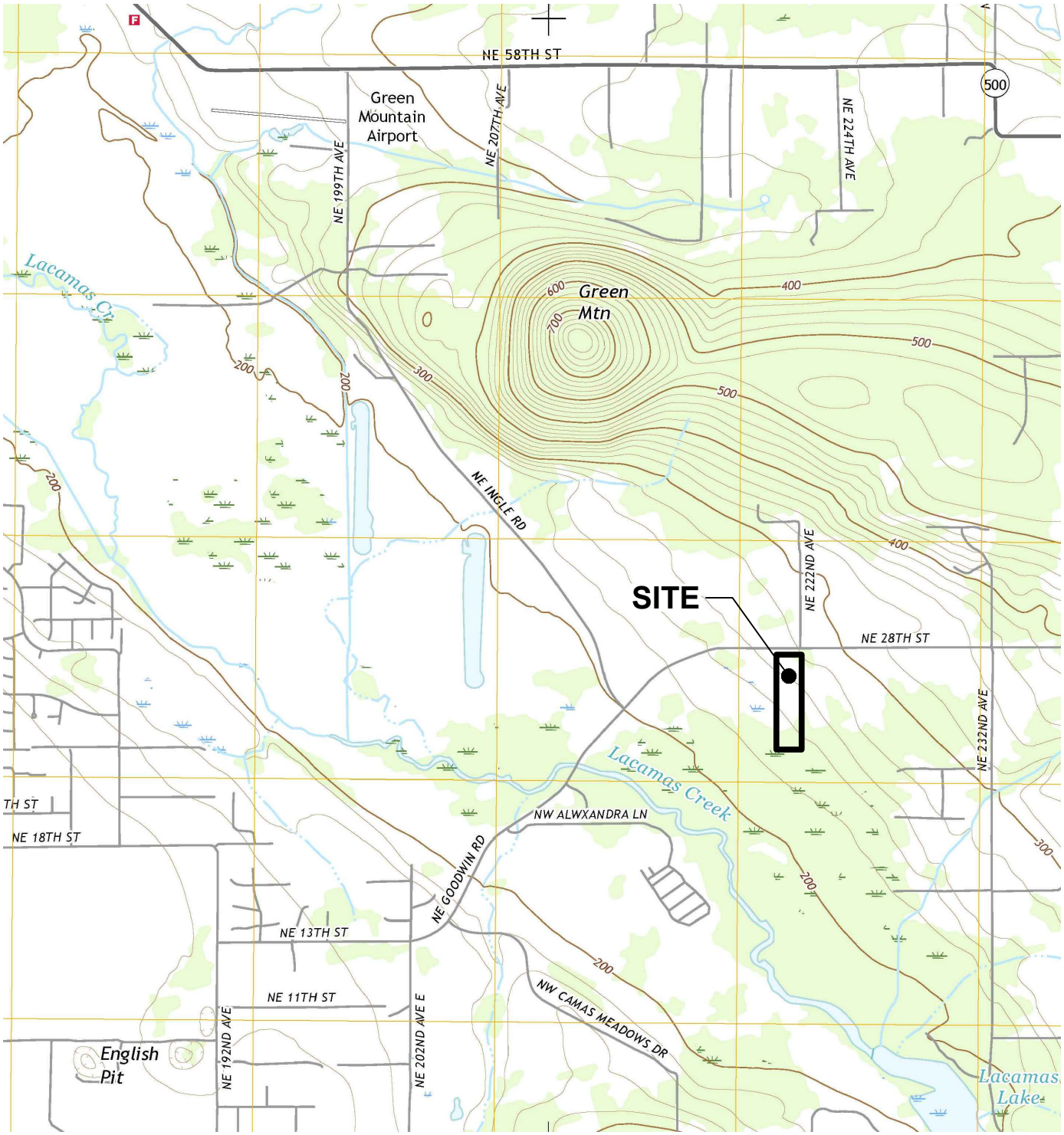
U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). 2022. Washington State Hydric Soils List. Available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. [Accessed 2025].

U. S. Fish & Wildlife Service. 2022. National Wetlands Inventory. Online document. Available at: http:www.wetlandsfws.er.usgs.gov/NWI/index.html. [Accessed 2025].

Wakeley, J.S.; R.W. Lichvar; and C.V. Noble, eds. U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Washington State Department of Ecology (WDOE). 1997. Washington State Wetlands Identification and Delineation Manual. Publication #96-94. Olympia, Washington.

Washington State Department of Fish and Wildlife (WDFW). Management Recommendations for Washington's Priority Habitats – Oregon White Oak Woodlands (Larsen, 1998).



NOTE(S):
USGS, LACAMAS CREEK QUADRANGLE
WASHINGTON-CLARK CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

Ash ECO SOLUTIONS, LLC

PARCEL(S): 173210000, 173177000 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	VICINITY MAP **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** Landing at Green Mountain Ph II **SITE LOCATION ADDRESS:** Parcels East of 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 1 **DATE:** 5-27-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



Legend

- Taxlots
- Contours Lines - 2 ft
- Contour Lines - 10 ft
- Contour Lines - 100 ft

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC

PARCEL(S):
173210000, 173177000

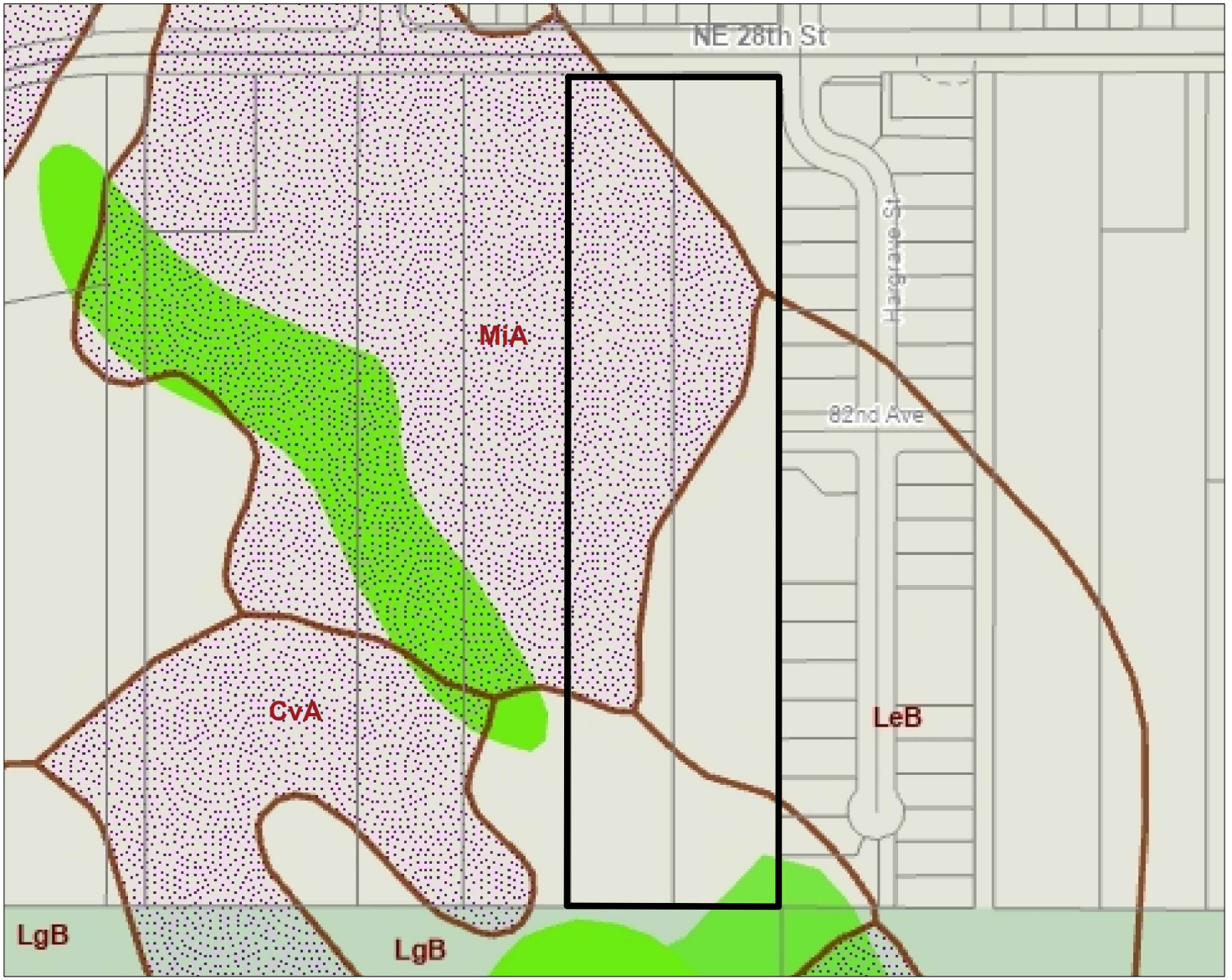
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

AERIAL PHOTO & TOPO MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain
SITE LOCATION ADDRESS:
Parcels East of 2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 2
DATE: 5-27-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



Legend

- Taxlots
- Soil Type
- Hydric Soils
- Potential Wetlands Presence
- Permitted Wetland
- NWI Wetland

CvA -

MiA -

LeB -

LgB -

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC

PARCEL(S):
173210000, 173177000

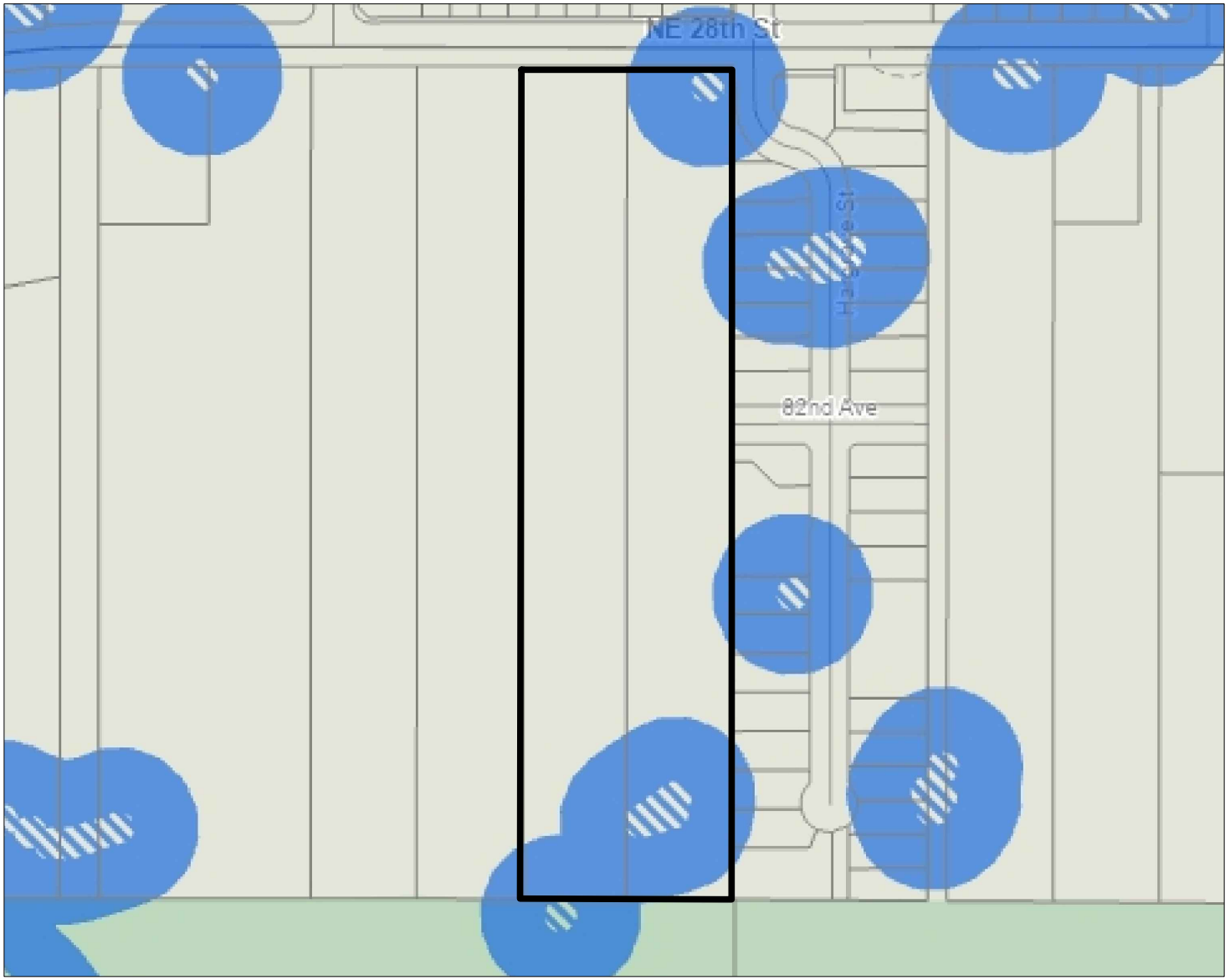
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

SOIL SURVEY &
NATIONAL WETLANDS INVENTORY MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain
SITE LOCATION ADDRESS:
Parcels East of 2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 3
DATE: 5-27-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



Legend

- Taxlots
- Species
  - Species Area
  - Adjacent to Species Area
- Habitat
  - Habitat Area
  - Adjacent to Habitat Area
- Riparian Habitat Site Class
- Stream
- Lake

N

0 250 500

SCALE IN FEET
1" = 250'

Ash ECO SOLUTIONS, LLC

PARCEL(S):
173210000, 173177000

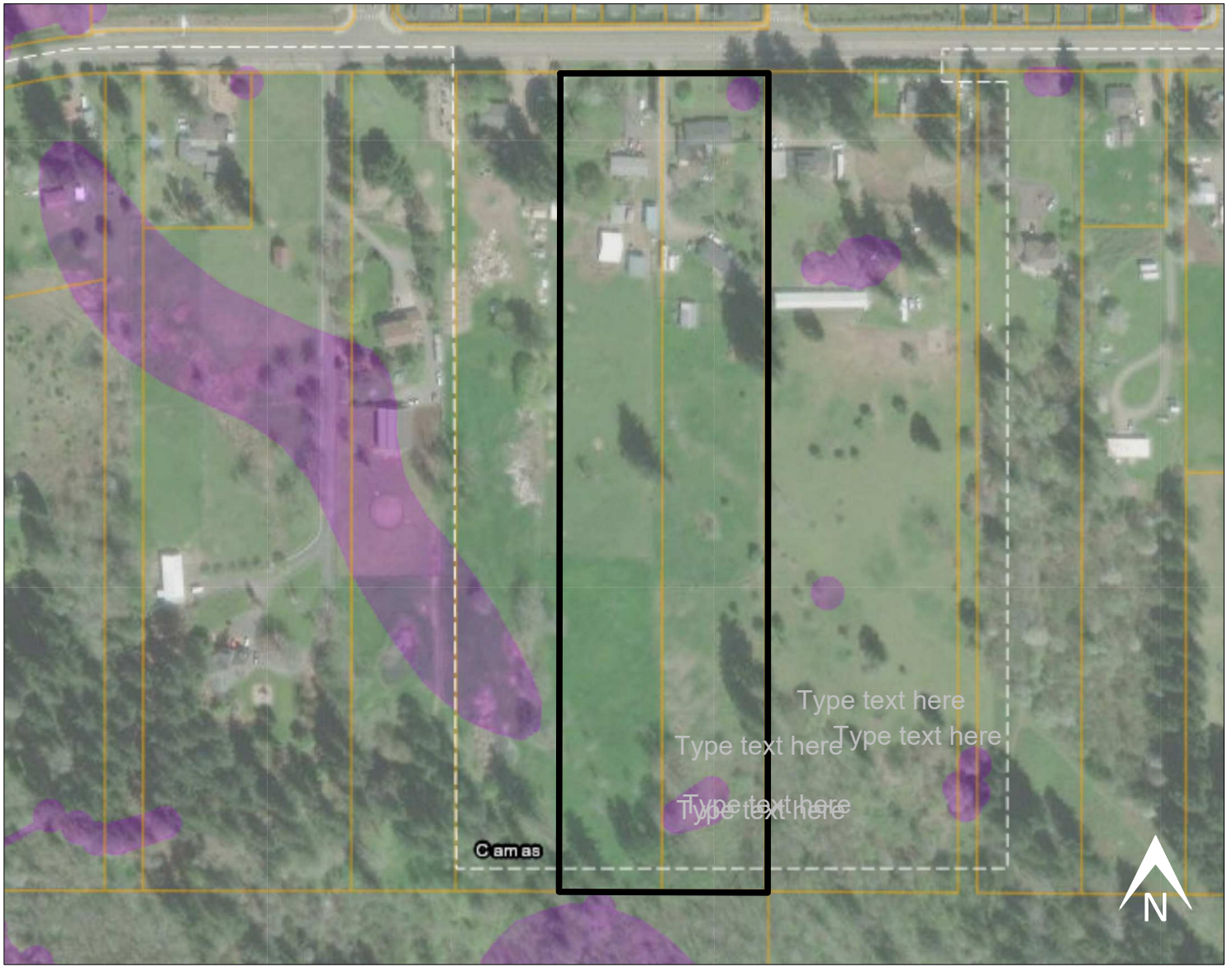
DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

RIPARIAN HABITAT & SPECIES MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain
SITE LOCATION ADDRESS:
Parcels East of 2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 4
DATE: 5-27-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



Legend

Parcels

Parcels

PHS on the Web

PHS Public Points

PHS Public Lines

PHS Public Polygon Outlines

AS MAPPED

Masked

PHS Public Polygons

AS MAPPED

SECTION

QTR-TWP

TOWNSHIP

0 250 500

SCALE IN FEET

1" = 250'

Ash ECO SOLUTIONS, LLC

PARCEL(S):
173210000, 173177000

DATUM: NAVD 88
ADJACENT PROPERTY OWNERS:
Adj 1
Adj 2

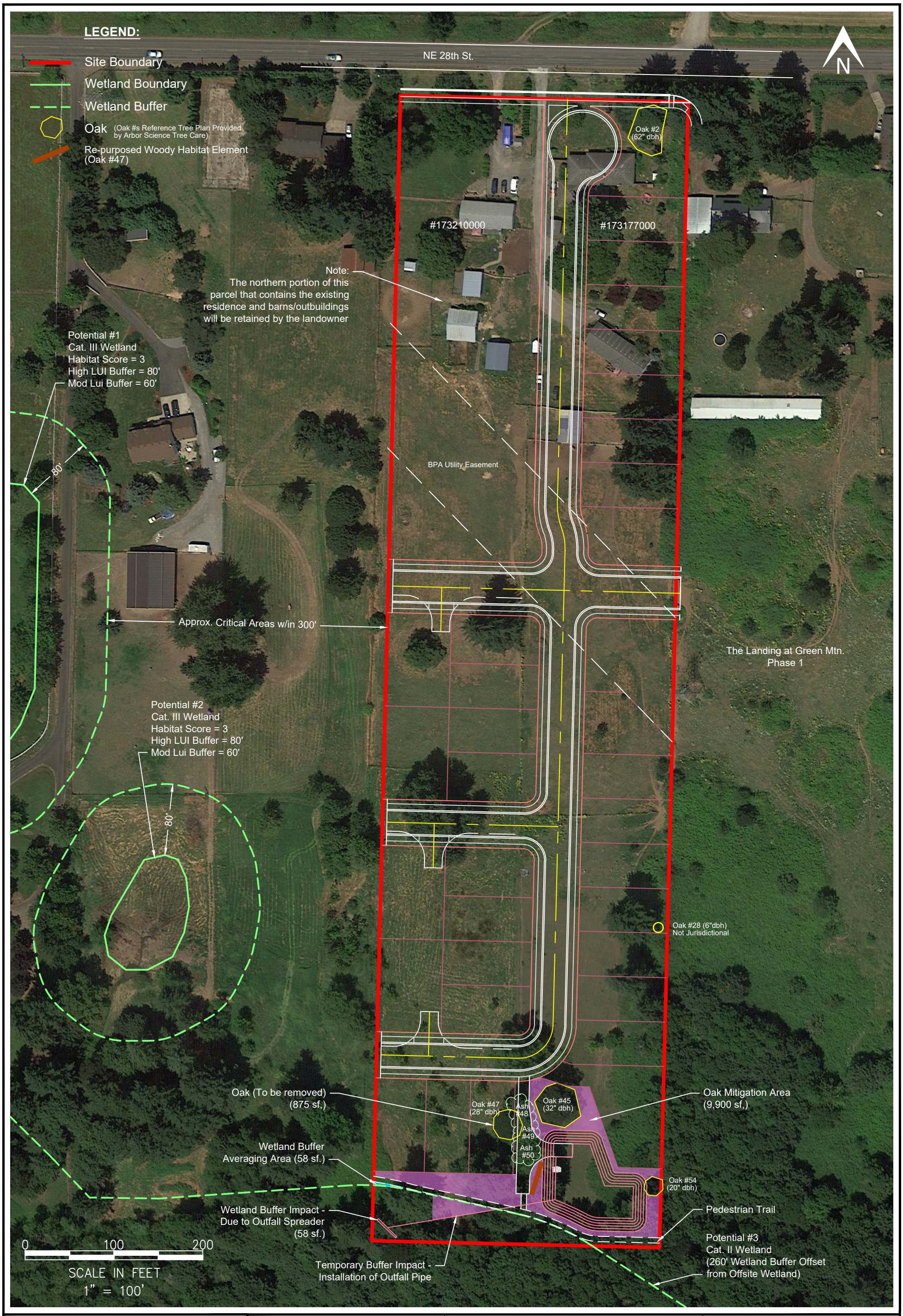
WDFW PHS MAP

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain Ph II
SITE LOCATION ADDRESS:
Parcels East of 2625 NE Goodwin Rd.

PROPOSED: XX
Add 2
IN: Camas
NEAR: XX
COUNTY: Clark **STATE:** WA
FIGURE: 5
DATE: 5-27-25

1250

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg



I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-062625.dwg

AshECO SOLUTIONS, LLC	**PARCEL(S):** 173210000, 173177000 **DATUM:** NAVD 88 **ADJACENT PROPERTY OWNERS:** Adj 1 Adj 2	EXISTING CONDITIONS & PROPOSED SITE PLAN **APPLICANT:** Pacific Lifestyle Homes **PROJECT NAME:** Landing at Green Mountain - II **SITE LOCATION ADDRESS:** Parcels East of 2625 NE Goodwin Rd.	**PROPOSED:** XX Add 2 **IN:** Camas **NEAR:** XX **COUNTY:** Clark **STATE:** WA **FIGURE:** 6 **DATE:** 6-16-25

Appendix A

Site Photos

The Landing at Green Mountain - Site Photos



Photo 1.
View of the open pasture area located in the central portion of the study area. This area has historically been used to graze cattle.



Photo 2.
The Oregon white oak located in the far southeast corner of the study area is visible in center of photos (dark green canopy). This tree will be retained. The understory has historically been grazed and mowed.



Photo 3.
View south down the far eastern property line of the study area. The bulk of the area consists of open pasture grasses. The large Douglas-fir tree visible at left of photo is located near the east property line. The forested area visible in back of photo represents the offsite undeveloped park property owned by Clark County.

Appendix B

Wetland Rating Forms

Wetland name or number Offsite Wetland #1

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Offsite Wetland #1 Date of site visit: 6/13/2024

Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___No Date of training 10/16

HGM Class used for rating Depressional Wetland has multiple HGM classes? ✓ Y ____N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY ___✓___ (based on functions___ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27
_____**Category II** – Total score = 20 - 22
___✓___**Category III** – Total score = 16 - 19
_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	H M (L)	
Landscape Potential	(H) M L	H (M) L	H M (L)	
Value	(H) M L	H (M) L	H M (L)	**TOTAL**
Score Based on Ratings	8	6	3	17

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	✓

Wetland name or number Offsite Wetland #1

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number Offsite Wetland #1

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   X___The wetland is on a slope (slope can be very gradual),
   X___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   ____The water leaves the wetland **without being impounded**. Note: Water is impounded at south

   NO – go to 5 **YES –** The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number Offsite Wetland #1 Type text here

5. Does the entire wetland unit **meet all** of the following criteria?
   ____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**
   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number Offsite Wetland #1

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed plants > 95% of area points = 5 Wetland has persistent, ungrazed plants > ½ of area points = 3 Wetland has persistent, ungrazed plants ≥ 1/10 of area points = 1 Wetland has persistent, ungrazed plants < 1/10 of area Wetland located within horse pasture that is regularly grazed. points = 0	0
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is ≥ ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	6

Rating of Site Potential If score is: __**12-16 = H** ✓**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source Wetland located within horse pasture that is regularly grazed. Yes = 1 No = 0	1
Total for D 2 Add the points in the boxes above	3

Rating of Landscape Potential If score is: ✓**3 or 4 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which the unit is found.) Yes = 2 No = 0	1
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: ✓**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #1

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream/ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (question 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	8

Rating of Site Potential If score is: __**12-16 = H** ✓**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	1
Total for D 5 Add the points in the boxes above	2

Rating of Landscape Potential If score is: __**3 = H** ✓**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. Is the unit in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met. The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately downgradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther downgradient. points = 1 • Flooding from groundwater is an issue in the sub-basin. points = 1 • The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 • There are no problems with flooding downstream of the wetland. points = 0	1
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	1

Rating of Value If score is: __**2-4 = H** ✓**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #1

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac. **1**

____Aquatic bed	4 structures or more: points = 4
_✓_Emergent	3 structures: points = 2
____Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1
____Forested (areas where trees have > 30% cover)	1 structure: points = 0

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods **1**

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated	4 or more types present: points = 3
_✓_Seasonally flooded or inundated	3 types present: points = 2
____Occasionally flooded or inundated	2 types present: points = 1
_✓_Saturated only	1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland	
____Intermittently or seasonally flowing stream in, or adjacent to, the wetland	
____**Lake Fringe wetland**	**2 points**
____**Freshwater tidal wetland**	**2 points**

H 1.3. Richness of plant species **1**

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

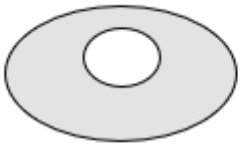
If you counted: > 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = 0

H 1.4. Interspersion of habitats **0**

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high.



None = 0 points

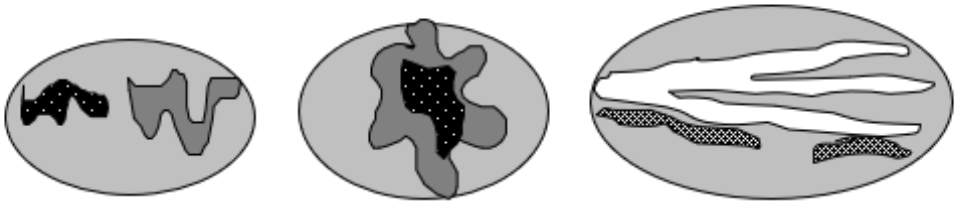


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



Wetland name or number Offsite Wetland #1

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ____Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ____Standing snags (dbh > 4 in.) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) __✓__At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	1
Total for H 1 Add the points in the boxes above	4

Rating of Site Potential If score is: __**15-18 = H** ___**7-14 = M** __✓__**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 0% **+** [(18% moderate and low intensity land uses)/2] = 9 % Total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 26% **+** [(18% moderate and low intensity land uses)/2] = 22 % Total habitat > 50% of Polygon points = 3 Total habitat 10-50% and in 1-3 patches points = 2 Total habitat 10-50% and > 3 patches points = 1 Total habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is: __**4-6 = H** ___**1-3 = M** __✓__**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more Priority Habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW Priority Species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	0

Rating of Value If score is: __**2 = H** ___**1 = M** __✓__**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #1

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number _____

- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats
- **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

Water

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes = **Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No = **Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No = **Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata
[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* — The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

Wetland Rating Form Divider Sheet

Wetland name or number Offsite Wetland #2

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Offsite Wetland #2 Date of site visit: _____

Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___No Date of training 10/16

HGM Class used for rating Depressional Wetland has multiple HGM classes? ✓ Y ____N

NOTE: **Form is not complete without the required figures** (figures can be combined).
Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY ___✓___ (based on functions___ or special characteristics__)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

___✓___**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	H M (L)	
Landscape Potential	(H) M L	H (M) L	H M (L)	
Value	(H) M L	H (M) L	H M (L)	**TOTAL**
Score Based on Ratings	8	6	3	17

Score for each function based on three ratings (order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	✓

Wetland name or number Offsite Wetland #2

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and total habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number Offsite Wetland #2

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe, it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.

2. The entire wetland unit is flat, and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size,
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ____The wetland is on a slope (slope can be very gradual),
   ____The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheet flow, or in a swale without distinct banks,
   ____The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

Wetland name or number Offsite Wetland #2

5. Does the entire wetland unit **meet all** of the following criteria?
   ____The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ____The overbank flooding occurs at least once every 2 years.

   NO – go to 6 **YES** – The wetland class is **Riverine**
   NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? This means that any outlet, if present, is higher than the interior of the wetland.

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number Offsite Wetland #2

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in. below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed plants > 95% of area points = 5 Wetland has persistent, ungrazed plants > ½ of area points = 3 Wetland has persistent, ungrazed plants ≥ 1/10 of area points = 1 Wetland has persistent, ungrazed plants < 1/10 of area Wetland located within horse pasture that is regularly grazed. points = 0	0
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is ≥ ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	6

Rating of Site Potential If score is: __**12-16 = H** ✓**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source waterfowl Yes = 1 No = 0	1
Total for D 2 Add the points in the boxes above	3

Rating of Landscape Potential If score is: ✓**3 or 4 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (Answer YES if there is a TMDL in development or in effect for the basin in which the unit is found.) Yes = 2 No = 0	1
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: ✓**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #2

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream/ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (question 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part. Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the area of the wetland unit itself. The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	8

Rating of Site Potential If score is: __**12-16 = H** ✓**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	1
Total for D 5 Add the points in the boxes above	2

Rating of Landscape Potential If score is: __**3 = H** ✓**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. Is the unit in a landscape that has flooding problems? Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met. The wetland captures surface water that would otherwise flow downgradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately downgradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther downgradient. points = 1 • Flooding from groundwater is an issue in the sub-basin. points = 1 • The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 • There are no problems with flooding downstream of the wetland. points = 0	1
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	1

Rating of Value If score is: __**2-4 = H** ✓**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #2

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of ¼ ac if the unit is at least 2.5 ac, or more than 10% of the unit if it is smaller than 2.5 ac.

____Aquatic bed	4 structures or more: points = 4	1
_✓_Emergent	3 structures: points = 2	
____Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1	
____Forested (areas where trees have > 30% cover)	1 structure: points = 0	

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/groundcover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if the unit is < 2.5 ac, or ¼ ac if the unit is at least 2.5 ac to count (see text for descriptions of hydroperiods).

____Permanently flooded or inundated	4 or more types present: points = 3	1
_✓_Seasonally flooded or inundated	3 types present: points = 2	
____Occasionally flooded or inundated	2 types present: points = 1	
_✓_Saturated only	1 type present: points = 0	
____Permanently flowing stream or river in, or adjacent to, the wetland		
____Intermittently or seasonally flowing stream in, or adjacent to, the wetland		
____**Lake Fringe wetland**	**2 points**	
____**Freshwater tidal wetland**	**2 points**	

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canada thistle**

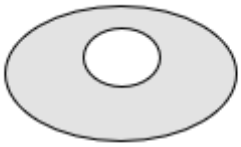
If you counted: > 19 species	points = 2	1
5 - 19 species	points = 1	
< 5 species	points = 0	

H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. If you have four or more plant classes or three classes and open water, the rating is always high. 0



None = 0 points

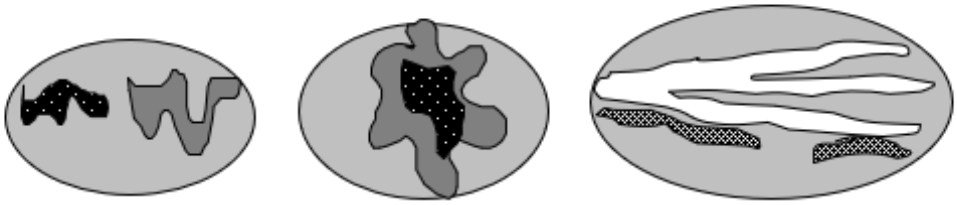


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **High** = 3 points



Wetland name or number Offsite Wetland #2

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. The number of checks is the number of points. ____Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft long). ____Standing snags (dbh > 4 in.) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extend at least 3.3 ft (1 m) over open water or a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet weathered where wood is exposed) ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians) ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 above for the list of strata and H 1.5 in the manual for the list of aggressive plant species)	1
Total for H 1 Add the points in the boxes above	4

Rating of Site Potential If score is: __**15-18 = H** ___**7-14 = M** ✓**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include only habitat polygons accessible from the wetland. *Calculate:* % relatively undisturbed habitat 0% **+** [(18% moderate and low intensity land uses)/2] = 9 % Total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Total habitat in 1 km Polygon around the wetland. *Calculate:* % relatively undisturbed habitat 26% **+** [(18% moderate and low intensity land uses)/2] = 22 % Total habitat > 50% of Polygon points = 3 Total habitat 10-50% and in 1-3 patches points = 2 Total habitat 10-50% and > 3 patches points = 1 Total habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is: __**4-6 = H** ___**1-3 = M** ✓**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more Priority Habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW Priority Species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources data — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 Priority Habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	0

Rating of Value If score is: __**2 = H** ___**1 = M** ✓ **0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #2

WDFW Priority Habitats

See complete descriptions of Priority Habitats listed by WDFW, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008 (current year, as revised). Priority Habitat and Species List.[133] This list was updated for consistency with guidance from WDFW.

This question is independent of the land use between the wetland unit and the Priority Habitat. All vegetated wetlands are by definition a Priority Habitat but are not included in this list because they are addressed by this rating system.

Count how many of the following Priority Habitats are within 330 ft (100 m) of the wetland unit:

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife. This habitat automatically counts if mapped on the PHS online map within 100m of the wetland. If not mapped, a determination can be made in the field.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Fresh Deepwater:** Lands permanently flooded with freshwater, including environments where surface water is permanent and often deep, so that water, rather than air, is the principal medium within which the dominant organisms live. Substrate does not support emergent vegetation. Do not select if Instream habitat is also present, or if the entire Deepwater feature is included in the wetland unit being rated (such as a pond with a vegetated fringe).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. Do not select if Fresh Deepwater habitat is also present.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in. (81 cm) diameter at breast height (dbh) or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in. (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

[133] http://wdfw.wa.gov/publications/00165/wdfw00165.pdf

Wetland name or number Offsite Wetland #2

- **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important. For single oaks or oak stands <0.4 ha in urban areas, WDFW's Management Recommendations for Oregon White Oak[134] provides more detail for determining if they are Priority Habitats
- **Riparian:** The area adjacent to freshwater aquatic systems with flowing or standing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in. (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in. (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.
- **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie.

[134] https://wdfw.wa.gov/publications/00030/wdfw00030.pdf

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes – Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No – Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 10% cover of non-native plant species. If non-native species are *Spartina*, see chapter 4.8 in the manual. — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Does the wetland overlap with any known or historical rare plant or rare & high-quality ecosystem polygons on the WNHP Data Explorer?[135] Yes = **Category I** No – Go to **SC 2.2** SC 2.2. Does the wetland have a rare plant species, rare ecosystem (e.g., plant community), or high-quality common ecosystem that may qualify the site as a WHCV? Contact WNHP for resources to help determine the presence of these elements. Yes – Submit data to WA Natural Heritage Program for determination,[136] Go to **SC 2.3** No = **Not a WHCV** SC 2.3. Did WNHP review the site within 30 days and determine that it has a rare plant or ecosystem that meets their criteria? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES, you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in. or more of the first 32 in. of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in. deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in. deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No = **Not a bog**	**Cat. I**

[135] https://www.dnr.wa.gov/NHPdata
[136] https://www.dnr.wa.gov/Publications/amp_nh_sighting_form.pdf

Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as Priority Habitats? ***If you answer YES, you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in. (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in. (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* — The lagoon retains some of its surface water at low tide during spring tides Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species in H 1.5 in the manual). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer YES, you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 and Ocean Shores Blvd SW, including lands west of E. Oceans Shores Blvd SW. Yes – Go to **SC 6.1** No = **Not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

Wetland Rating Form Divider Sheet

Wetland name or number Offsite Wetland #3

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Offsite Wetland #3 Date of site visit: _____
Rated by Andrea Aberle Trained by Ecology? ✓ Yes ___No Date of training 10/06

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___Y _X_N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY ___II___ (based on functions ✓ or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27
__X__**Category II** – Total score = 20 - 22
_____**Category III** – Total score = 16 - 19
_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	(H) M L	
Landscape Potential	H (M) L	H (M) L	H (M) L	
Value	(H) M L	H (M) L	(H) M L	**TOTAL**
Score Based on Ratings	7	6	8	21

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	✓

Wetland name or number Potential Wetland #3 - Offsite to south

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number Offsite Wetland #3

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ✓ The wetland is on a slope (*slope can be very gradual*),
   ✓ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   X The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES** – The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number Offsite Wetland #3

NO – go to 6 **YES** – The wetland class is **Riverine**
NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number Offsite Wetland #3

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions).* Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	9

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)? Yes = 2 No = 0	1
Total for D 3 Add the points in the boxes above	3

Rating of Value If score is: ✓ **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #3

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?

D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	8

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?

D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	0
Total for D 5 Add the points in the boxes above	1

Rating of Landscape Potential If score is: ___ **3 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): • Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 • Surface flooding problems are in a sub-basin farther down-gradient. points = 1 Flooding from groundwater is an issue in the sub-basin. points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland. points = 0	1
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	1

Rating of Value If score is: ___ **2-4 = H** ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #3

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

X Aquatic bed	4 structures or more: points = 4
X Emergent	3 structures: points = 2
X Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1
X Forested (areas where trees have > 30% cover)	1 structure: points = 0

If the unit has a Forested class, check if:

____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

4

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

____Permanently flooded or inundated	4 or more types present: points = 3
X Seasonally flooded or inundated	3 types present: points = 2
____Occasionally flooded or inundated	2 types present: points = 1
X Saturated only	1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland	
X Seasonally flowing stream in, or adjacent to, the wetland	
____**Lake Fringe wetland**	**2 points**
____**Freshwater tidal wetland**	**2 points**

2

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

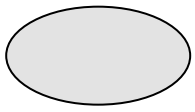
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted: > 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = 0

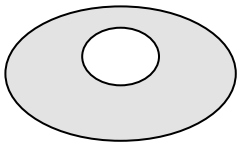
2

H 1.4. Interspersion of habitats

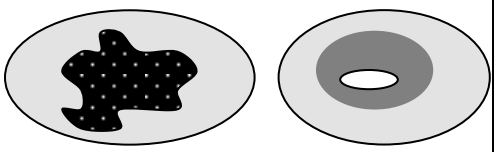
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points

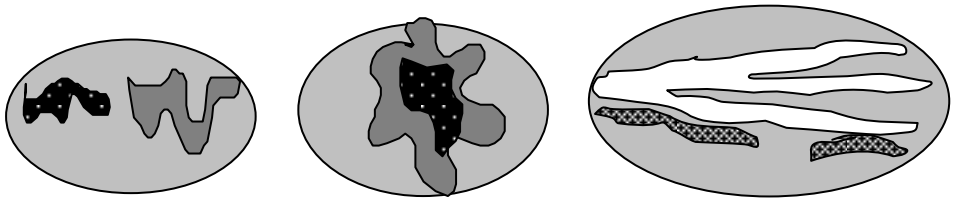


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **HIGH** = 3points



2

Wetland name or number Offsite Wetland #3

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* X Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). X Standing snags (dbh > 4 in) within the wetland X Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* X At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* X Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	5
Total for H 1 Add the points in the boxes above	15

Rating of Site Potential If score is: ✓ **15-18 = H** ___ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon 9% Accessible + (31/2) 15.5% = 24.5% points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat___ **+** [(% moderate and low intensity land uses)/2]___ **=** _____% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches 20% Undist + (15.5%) = 35.5 (4 patches) points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use High LUI = 40% points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	0
Total for H 2 Add the points in the boxes above	3

Rating of Landscape Potential If score is: ___ **4-6 = H** ✓ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 X It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: ✓ **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number Offsite Wetland #3

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

✓ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

✓ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes **–** Go to **SC 2.2** No **–** Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

Wetland name or number _____

This page left blank intentionally

Appendix C

Tree Plan

(Arbor Science Tree Care, June 2025)

ARBOR SCIENCE TREE CARE
SPECIALIZING IN SUSTAINABLE TREE CARE SOLUTIONS
arborsciencetreecare.com
360.521.0249
WA# ARBORST838DT OR CCB# 216351

June 28th 2025

Pacific Lifestyle Homes
1815 NE 99th St Vancouver WA 98682

The Landing At Green Mountain 2
22111 NE 28th St Camas WA 98607
Parcel # 173177000, 173210000

Re: Tree Survey per City of Camas CMC 18.13.045

Tree, Vegetation and Soil Protection During Construction.

During construction. Prior to initiating tree removal on the site, soils, vegetated areas and individual trees to be preserved shall be protected from potentially damaging activities pursuant to the following standards.

A. Placing Materials Near Trees. No person may conduct any activity within the protected area of any tree designated to remain, including, but not limited to, parking equipment, placing solvents, storing building material and soil deposits, dumping concrete washout and locating burn holes.

1. During construction, no person shall attach any object to any tree designated for protection.

B. Protective Barrier. Before development, land clearing, filling or any land alteration for which a tree is to be protected. The contractor
1. Shall erect and maintain readily visible protective tree fencing along the outer edge and completely surrounding the protected area of all protected trees or groups of trees that are to remain undisturbed. Fences shall be constructed of chain link and at least four feet high, unless other type of fencing is authorized by the planning official.

2.Shall prohibit excavation or compaction of earth or other potentially damaging activities within the barriers.

3. Shall maintain the protective barriers in place until the planning official authorizes their removal or a final certificate of occupancy is issued, whichever occurs first

4. Shall ensure that any landscaping done in the protected zone subsequent to the removal of the barriers shall be accomplished with light machinery or hand labor. No turf or lawn areas are to be installed within protected area.

5. In addition to the above, the planning official may require the following:

- Cover with mulch to a depth of at least six (6) inches or with plywood or similar material the areas adjoining the critical root zone of a tree in order to protect roots from damage caused by heavy equipment.

- Minimize root damage by excavating a two (2) foot deep trench, at edge of critical root zone, to cleanly sever the roots of trees to be retained.

- Have corrective pruning performed on protected trees in order to avoid damage from machinery or building activity.

- Maintain trees throughout construction period by watering and fertilizing if recommended by Arborist.

C. Grade.

1. The grade shall not be elevated or reduced within the critical root zone of trees to be preserved without the planning official's authorization. The planning official may allow coverage of up to one half of the area of the tree's critical root zone with light soils (no clay) to the minimum depth necessary to carry out grading or landscaping plans, if it will not imperil the survival of the tree. Aeration devices may be required to ensure the tree's survival.

2. If the grade adjacent to a preserved tree is raised such that it could slough or erode into the tree's critical root zone, it shall be permanently stabilized to prevent suffocation of the roots.

3. The applicant shall not install an impervious surface within the critical root zone of any tree to be retained without the authorization of the planning official. The planning official may require specific construction methods and/or use of aeration devices to ensure the tree's survival and to minimize the potential for root induced damage to the impervious surface.

4. To the greatest extent practical, utility trenches shall be located outside of the critical root zone of trees to be retained. The planning official may require that utilities be tunneled under the roots of

trees to be retained if the planning official determines that trenching would significantly reduce the chances of the tree's survival.

5. Trees and other vegetation to be retained shall be protected from erosion and sedimentation. Clearing operations shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, shrubs, ground cover and stumps shall be maintained on the individual lots, where feasible. Where not feasible appropriate erosion control practices shall be implemented pursuant to best management practices within industry standards.

D. Directional felling. Directional felling of trees shall be used to avoid damage to trees designated for retention and shall be conducted so as to expose the smallest practical area of soil to erosion for the least possible time. To control erosion, shrubs, ground cover and stumps shall be retained where feasible. Where not feasible, appropriate erosion control practices shall be implemented pursuant to

E. Additional requirements. The planning official or Arborist may require additional tree, vegetation and soil protection measures which are consistent with accepted best management practices.

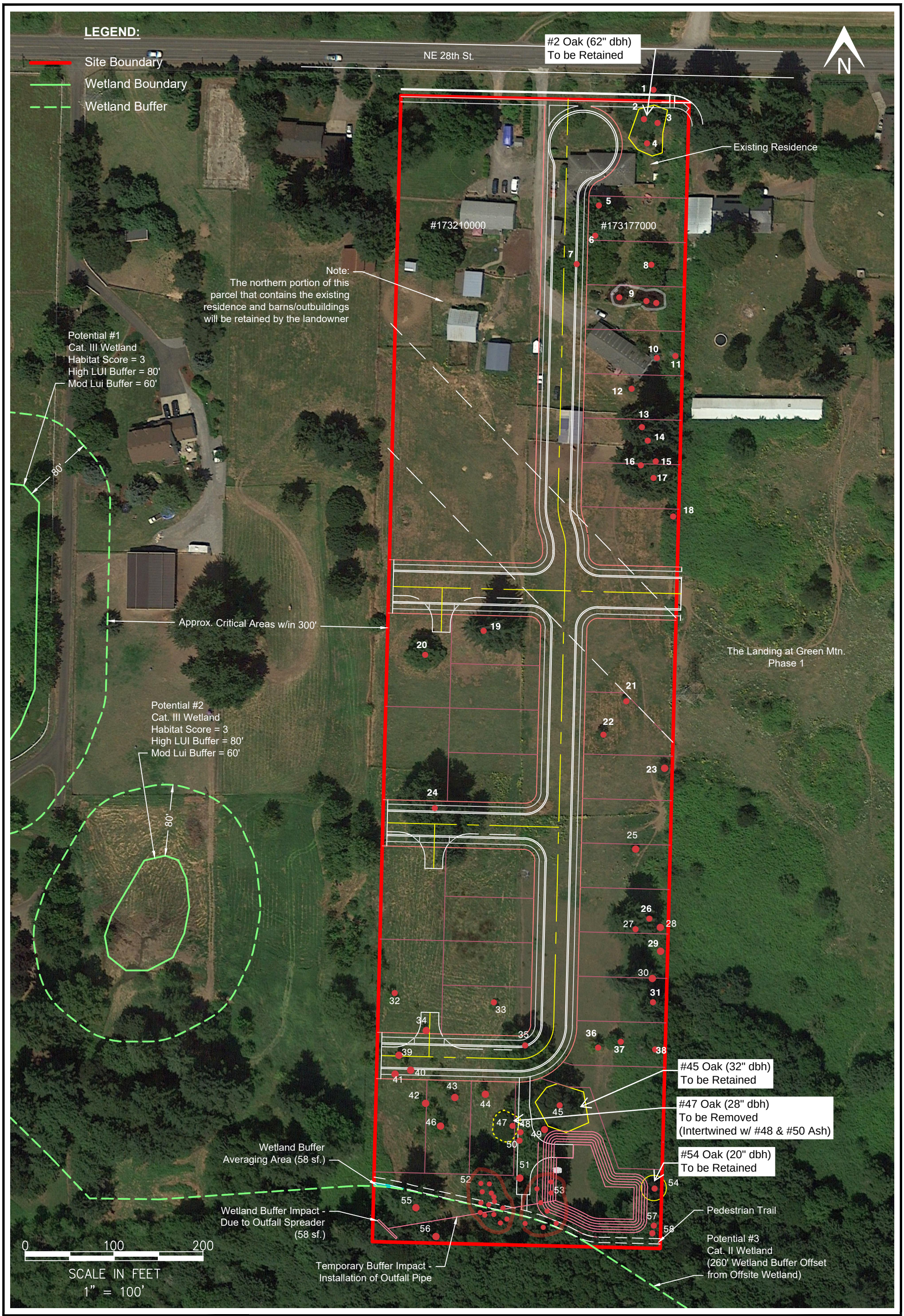
Tree Density Calculations:

Per City of Camas municipal code 18.13.045 this development requires 20 tree units per acre. The existing lot area is 9.59 acres, which has a density requirement of 191.8 tree units per acre. This proposed development retains 206 tree units to be preserved.
See attached map and table for tree detail and locations.

Prepared By Brandon Cheney
ISA Certified Arborist PN #7163A
TRAQ

Tree Number	Species	Common Name	DBH "	Retention Y/N	Condition	Tree Units
1	p. menziesii	Douglas-Fir	8	Y	Satisfactory	2
2	quercus	White Oak (multi stem)	62	Y	Satisfactory	26
3	p. menziesii	Douglas-Fir	52	Y	Satisfactory	22
4	cornus	Dogwood	9	Y	Satisfactory	2
5	acer	Bigleaf Maple	58	N	Fair	25
6	juglands	Black Walnut	31	N	Poor	12
7	juglands	Black Walnut	23	N	Fair	8
8	juglands	Black Walnut	24	N	Fair	8
9	prunus	(3 trees) Purple leaf plum	21	N	Fair	7
10	picea	Blue Spruce	9	N	Satisfactory	2
11	picea	Blue Spruce	9	N	Satisfactory	2
12	betula	(2 trees) Birch	8	N	Poor	2
13	p. menziesii	Douglas-Fir	46	N	Satisfactory	19
14	p. menziesii	Douglas-Fir	50	N	Satisfactory	21
15	p. menziesii	Douglas-Fir	46	N	Satisfactory	19
16	p. menziesii	Douglas-Fir	30	N	Satisfactory	11
17	p. menziesii	Douglas-Fir	41	N	Fair	17
18	acer	Bigleaf Maple (twin stem)	15	N	Poor	4
19	p. menziesii	Douglas-Fir	50	N	Fair	21
20	p. menziesii	Douglas-Fir	30	N	Dead	11
21	crataegus	Hawthorn	8	N	Satisfactory	2
22	fraxinus	Ash	8	N	Satisfactory	2
23	crataegus	Hawthorn	8	N	Satisfactory	2
24	fraxinus	Ash	24	N	Satisfactory	8
25	crataegus	Hawthorn	8	N	Satisfactory	2
26	p. menziesii	Douglas-Fir	46	N	Satisfactory	19
27	crataegus	Hawthorn	6	N	Satisfactory	2
28	quercus	White Oak	6	N	Fair	2
29	crataegus	Hawthorn	6	N	Satisfactory	2
30	p. menziesii	Douglas-Fir	50	N	Satisfactory	21
31	p. menziesii	Douglas-Fir	28	N	Poor	20
32	fraxinus	Ash	6	N	Satisfactory	2
33	fraxinus	Ash	6	N	Satisfactory	2
34	fraxinus	Ash	7	N	Satisfactory	2

Tree Number	Species	Common Name	DBH "	Retention Y/N	Condition	Tree Units
35	fraxinus	Ash (twin stem)	50	N	Satisfactory	21
36	fraxinus	Ash	10	N	Satisfactory	2
37	fraxinus	Ash (twin stem)	19	N	Satisfactory	6
38	salix	Willow	10	N	Poor	2
39	fraxinus	Ash (twin stem)	42	N	Satisfactory	17
40	fraxinus	Ash	7	N	Satisfactory	2
41	fraxinus	Ash	7	N	Satisfactory	2
42	fraxinus	Ash	9	N	Satisfactory	2
43	fraxinus	Ash	8	N	Satisfactory	2
44	fraxinus	Ash	10	N	Satisfactory	2
45	quercus	White Oak	32	Y	Satisfactory	12
46	fraxinus	Ash	7	N	Satisfactory	2
47	quercus	White Oak	28	N	Fair	10
48	fraxinus	Ash (twin stem)	33	N	Satisfactory	13
49	fraxinus	Ash (multi stem)	22	Y	Satisfactory	7
50	fraxinus	Ash (twin stem)	38	N	Fair	15
51	populas	Cottonwood	48	N	Satisfactory	20
52	populas	(14 tree grove) Cottonwood	188	Y	Satisfactory	90
53	populas	(8 tree grove) Cottonwood	116	N	Satisfactory	54
54	quercus	White Oak	20	Y	Fair	6
55	p. menziesii	Douglas-Fir	38	Y	Satisfactory	15
56	p. menziesii	Douglas-Fir	28	Y	Satisfactory	10
57	fraxinus	Ash	18	Y	Fair	5
58	fraxinus	Ash	25	Y	Fair	9



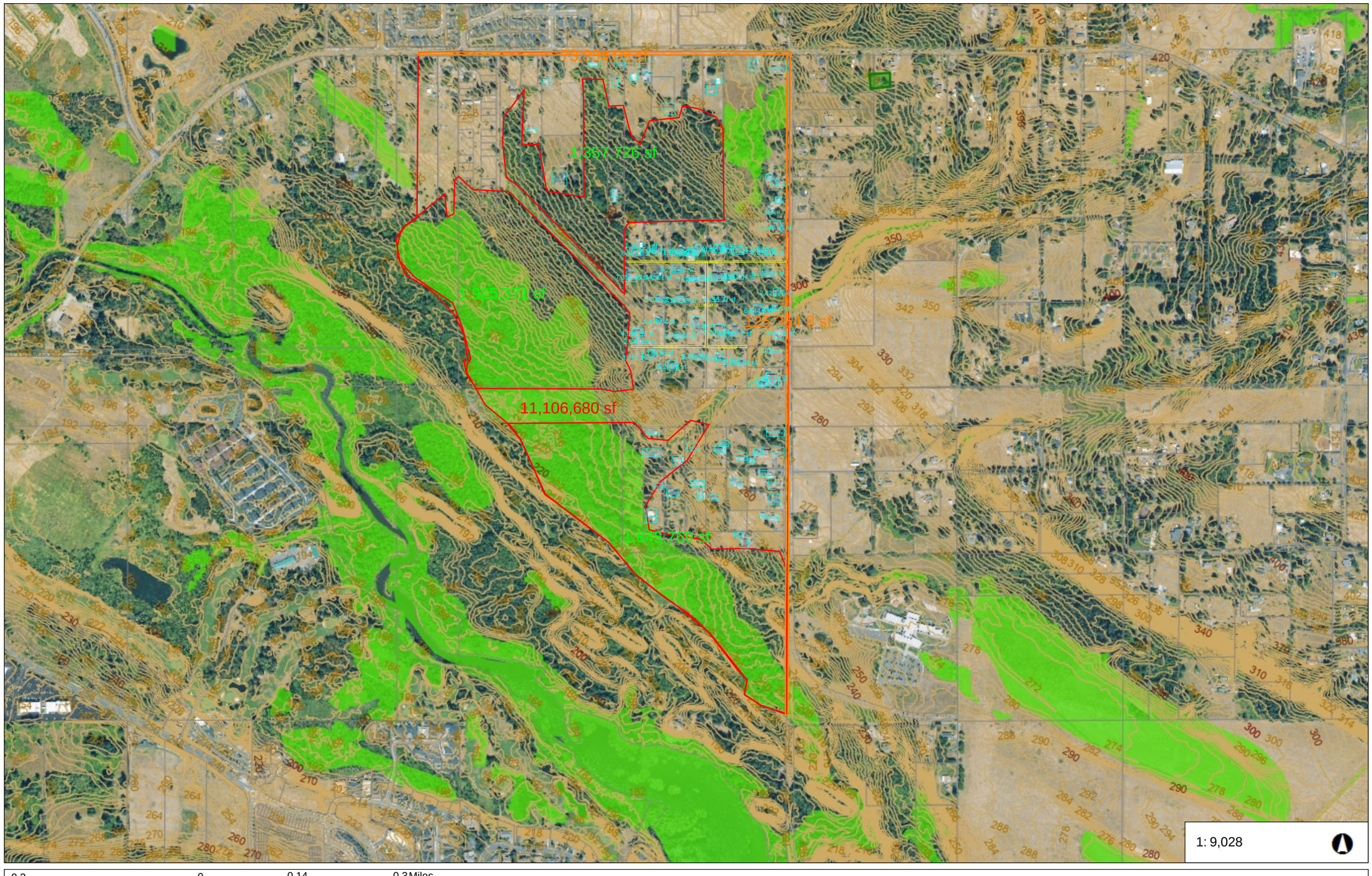
TREE PLAN

EXISTING CONDITIONS &
PROPOSED SITE PLAN

APPLICANT: Pacific Lifestyle Homes
PROJECT NAME: Landing at Green Mountain II
SITE LOCATION: 22015 & 22111 NE Goodwin Rd., Camas, WA

COUNTY: Clark **STATE:** ~~WA~~
FIGURE: 1
DATE: 6-24-25

I:\Autocad Files\AshECO Autocad\PLH Landing at Green Mtn\PLH-LAGM_BM-061625.dwg





Legend

- Taxlots
- Contours Lines - 2 ft
- Contour Lines - 10 ft
- Contour Lines - 100 ft
- Potential Wetlands Presence

1: 9,028

Notes:

1300

0.3 0 0.14 0.3 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information. Taxlot (i.e., parcel) boundaries cannot be used to determine the location of property lines on the ground.

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

August 13, 2025

Lisa Harker, PLS Engineering
pm@plsengineering.com

Nick Edwards
nicke@buildplh.com

RE: SUB25-1006: Proposed 34-lot subdivision - "The Landing at Green Mountain 2"

Dear Applicant,

Thank you for your submittal for the proposed 34-lot subdivision (The Landing at Green Mountain 2). I am the case planner assigned to this project. The purpose of this letter is to inform you that the application submitted on July 14, 2025, has been deemed incomplete and there are items that need to be addressed before we move forward with the review process.

Once the items below are submitted, staff will review the information to verify whether the application can be deemed complete. As a reminder, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite applicable code requirements shall not constitute a waiver by the City of any standard or requirement.

The items necessary for completeness are as follows:

PLANNING

- Table of contents notes Preliminary Plans as item #16, but the item has not been uploaded. Please ensure that the plans include a Preliminary Landscape Plan and a detailed Tree Survey.
- Please submit photo of Development Sign once installed on project site.

Engineering

CMC 17.11.030.B.6.n: Description, location and size of existing and proposed utilities, storm drainage facilities and roads to serve the lots.

- The preliminary utility plans did not include sizes of the existing or proposed utility mains or proposed stormwater system.

CMC 17.11.030.B.8: Preliminary stormwater plan and preliminary stormwater technical information report (TIR). The PTIR is to be prepared in accordance with Ecology's latest edition Stormwater Management Manual for Western Washington (SWMMWW).

- The proposed project is located in the City of Camas and is subject to the city's wetland requirements, not Clark County's wetland requirements, as noted and discussed throughout pages 8 through 16, Section H – Wetland Protection.

- The PTIR is to be revised and resubmitted in accordance with Ecology's 2024 SWMMWW for Wetland Protection and City of Camas Critical Areas Municipal Code.
- Section I – Other Permits references that are not applicable to a Subdivision Land-Use Application, such as preliminary site plan and final site plan approval and building permit approval.
    - Required: Final Decision issued by Hearing Examiner, civil engineering plan approval, and NPDES Permit.
- Section J – Conveyance Systems Analysis and Design states that conveyance design will be provided with the Final TIR.
    - Preliminary stormwater plans are to be submitted with the application.

Non-technically complete comments:

- Additional comments may be provided by Staff, City of Vancouver, and Clark County after review of the Transportation Impact Study.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,



Yvette Sennewald, Senior Planner

PLS ENGINEERING
ENGINEERING | SURVEYING | PLANNING
604 W EVERGREEN BLVD, VANCOUVER, WA 98660
P 360.944.6519 | F 360.944.6539 | PLSENGINEERING.COM

August 18, 2025

Community Development Department
616 NE 4th Avenue
Camas, WA 98607

RE: The Landing at Green Mountain 2 Subdivision, SUB25-1006
Review Response Letter

This letter has been written to respond to the specific issues identified by City staff during their review of the application materials for this project. The City staff comments have been included in this document and the responses are included below the issue in bold text.

- Table of contents notes Preliminary Plans as item #16, but the item has not been uploaded. Please ensure that the plans include a Preliminary Landscape Plan and a detailed Tree Survey.

  The table of contents have been updated, the landscape plan and tree survey are attached.

- Please submit photo of Development Sign once installed on project site

  The sign has been installed and a photo has been sent to Yvette.

- CMC 17.11.030.B.6.n: Description, location and size of existing and proposed utilities, storm drainage facilities and roads to serve the lots.
  - The preliminary utility plans did not include sizes of the existing or proposed utility mains or proposed stormwater system.

  Utility plan updated with sizes for existing and proposed utility mains and stormwater system.

- CMC 17.11.030.B.8: Preliminary stormwater plan and preliminary stormwater technical information report (TIR). The PTIR is to be prepared in accordance with Ecology's latest edition Stormwater Management Manual for Western Washington (SWMMWW).

PLS ENGINEERING
ENGINEERING | SURVEYING | PLANNING
604 W EVERGREEN BLVD, VANCOUVER, WA 98660
P 360.944.6519 | F 360.944.6539 | PLSENGINEERING.COM

- The proposed project is located in the City of Camas and is subject to the city's wetland requirements, not Clark County's wetland requirements, as noted and discussed throughout pages 8 through 16, Section H – Wetland Protection.

  The graph on page 8 has been changed from the Clark County flow chart to the Western Washington flow chart found in the Storm Water Management Manuel for Wester Washington. All references to Clark County Code has been updated to SWMMWW.

- The PTIR is to be revised and resubmitted in accordance with Ecology's 2024 SWMMWW for Wetland Protection and City of Camas Critical Areas Municipal Code.

  The PTIR has been updated to match SWMMWW wetland protection and City of Camas Critical Area Municipal Code.

- Section I – Other Permits references that are not applicable to a Subdivision Land-Use Application, such as preliminary site plan and final site plan approval and building permit approval.
  - Required: Final Decision issued by Hearing Examiner, civil engineering plan approval, and NPDES Permit.

  Section I now only states the required permit as listed above.

- Section J – Conveyance Systems Analysis and Design states that conveyance design will be provided with the Final TIR.
  - Preliminary stormwater plans are to be submitted with the application.

  Preliminary conveyance calculations were done and 15" inch storm main will convey all water through the site.

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

September 18, 2025

Lisa Harker, PLS Engineering
pm@plsengineering.com

Nick Edwards
nicke@buildplh.com

RE: SUB25-1006: Proposed 34-lot subdivision - "The Landing at Green Mountain 2"

Dear Applicant,

Staff has reviewed the additional items submitted on August 27, 2025 and has determined that the application is not complete at this time. There is one item that needs to be addressed before the project can be deemed technically complete to move forward with the review process.

The items necessary for completeness are as follows:

Engineering

CMC 17.11.030.B.6.n: Description, location and size of existing and proposed utilities, storm drainage facilities and roads to serve the lots.

- The size of the proposed water main is not included on the preliminary utility plans.

If you have any questions related to this project, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,

Yvette Sennewald, Senior Planner

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.cityofcamas.us

September 24, 2025

Pacific Lifestyle Homes
Attn: Lisa Harker
Sent via email: pm@plsengineering.com

RE: Technically Complete Letter for Planning Case SUB25-1006 - "The Landing at Green Mountain 2"

Dear Ms. Harker,

The purpose of this letter is to inform you that the above application submitted on July 14, 2025, has been deemed technically complete in accordance with Camas Municipal Code (CMC) Section 18.55.130.

Staff will begin reviewing the application and will contact you if there are any questions or comments. If you have any questions, please feel free to contact me by email: YSennewald@cityofcamas.us or by phone: (360) 817-7269.

Respectfully,

Yvette Sennewald, Senior Planner

Notice of Proposed Development

"The Reserve at Green Mountain"

An application is on file with the City of Camas for review of a "*Type III Subdivision application to establish proposed use*". For information regarding this project contact:

Applicant Contact:
Nick Edwards
(360) 597-7098
NickE@buildplh.com

City Contact:
Yvette Sennewald
(360) 817-7269
YSennewald@cityofcamas.us



Public Hearing Schedule:

Hearing Date/Time: December 9th, 2025
5:00 PM

Hearing Location: Camas City Hall
Council Chambers

In re: The Landing at Green Mountain 2

) NO. SUB25-1006
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on October 8, 2025, I directed a true and correct copy of the Notice of Application be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 9th day of October, 2025.

Aireanna Baldwin
Notary Public
State of Washington
My Appointment Expires 10/1/2028
Commission Number 183848

Aireanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2028

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

ELZINGA DANIEL L & JACOBS ALEXANDRA
22007 NE 28TH ST
CAMAS, WA 98607

HENDERSON TYNAN & HENDERSON HOPE
22217 NE 28TH ST
CAMAS, WA 98607

EMMERT FAMILY III LLC
10470 SE HILLCREST DR
HAPPY VALLEY, OR 97086

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

MIDDAGH LINDA
22015 NE 28TH STREET
CAMAS, WA 98607

HERTENSTEIN SKIP & HERTENSTEIN MELISSA
21919 NE 28TH ST
CAMAS, WA 98607

MERRITT ROCQUE & MERRITT SUE
3602 NE 222ND AVE
CAMAS, WA 98607

MERRITT GWENNA E
3602 NE 222ND AVE
CAMAS, WA 98607

EMMERT TERRY W
11811 SE HWY 212
CLACKAMAS, OR 97015

MURPHY JOAN FRANCES TRUSTEE
8649 N APPLETON ST
CAMAS, WA 98607

HO TUNG THANH & TRUONG LANH THI
8637 N APPLETON ST
CAMAS, WA 98607

MADDOX NICK VANCE & MADDOX JENNIFER RACHELLE
8625 N APPLETON ST
CAMAS, WA 98607

SMITH CHRISTOPHER CALVIN & SMITH MONIQUE MICHELLE
8613 N APPLETON ST
CAMAS, WA 98607

SIMMONS KIESHA M & SIMMONS CHRISTOPHER R
17014 NE 6TH ST
VANCOUVER, WA 98684

BONIFE ANDREW W & BONIFE ANDREA FAITH
6252 N 86TH AVE
CAMAS, WA 98607

LUMLEY CORBEN & LUMLEY JENNIFER
6238 N 86TH AVE
CAMAS, WA 98607

NEUDORFER KELSEY & BOCKELMAN EVAN
6226 N 86TH AVE
CAMAS, WA 98607

STUDEMAN TYLER KASEY & STUDEMAN KELLY MARIE
6214 N 86TH AVE
CAMAS, WA 98607

MITTELSTAEDT PAUL E JR & MITTELSTAEDT ELIZABETH
6202 N 86TH AVE
CAMAS, WA 98607

KUMMERMAN MICHAEL J & KUMMERMAN PAULINE VERONICA
6150 N 86TH AVE
CAMAS, WA 98607

RUTTER TROY EUGENE & RUTTER STEPHANIE DENISE
6138 N 86TH AVE
CAMAS, WA 98607

HOANG ALEXANDER TUNG & HIROMOTO KELBY AKEMI
6124 N 86TH AVE
CAMAS, WA 98607

DAHAL BIDHYA GURUNG & DAHAL LAXMI RAMAN
8602 N WRIGHT ST
CAMAS, WA 98607

BARROW ANSON DAVID & BARROW LAUNIE RAE
4331 SE 179TH CT
VANCOUVER, WA 98683

AXMAKER ANDREW & AXMAKER HOLLY
8616 N WRIGHT ST
CAMAS, WA 98607

RILER DANIEL JOSEPH & RILER MELINDA CATHERINE
8624 N WRIGHT ST
CAMAS, WA 98607

DOAN KHOA DANG & SAING STEPHANY SANPHILAY
8638 N WRIGHT ST
CAMAS, WA 98607

DVERSDAL BETTY J TRUSTEE
8643 N WRIGHT ST
CAMAS, WA 98607

XU JIAN & LIANG YUEHAI TRUSTEES
12462 NW WAKER DR
PORTLAND, OR 97229

VACA DANIEL
6221 N 86TH AVE
CAMAS, WA 98607

BUTTON SAUNDRA J & BUTTON COLTON L
6233 N 86TH AVE
CAMAS, WA 98607

PETERS TRACY LYNN
8638 N APPLETON ST
CAMAS, WA 98607

DEVERSDAL JENNIFER JEAN
8652 N APPLETON ST
CAMAS, WA 98607

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

MOY JOHN C JR
1811 NW FOREST HOME LN
CAMAS, WA 98607

BOUCHER RICHARD & BOUCHER KAREN TRUSTEES
8522 N HARGRAVE ST
CAMAS, WA 98607

PRINS BRANDON O & PRINS LINDSEY N
8510 N HARGRAVE ST
CAMAS, WA 98607

GME DEVELOPMENT LLC
1301 SE TECH CENTER DR STE 150
VANCOUVER, WA 98683

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

HENDERSON TYNAN & HENDERSON HOPE
22217 NE 28TH ST
CAMAS, WA 98607

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

RADABAUGH CAROL L KVINGE
8024 N HARGRAVE ST
CAMAS, WA 98607

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

NOTICE OF APPLICATION
The Landing at Green Mountain 2
(Planning Case Number: SUB25-1006)

Consolidated Files: State Environmental Policy Act, Archaeological and Critical Area Review

NOTICE IS HEREBY GIVEN that an application for the "Landing at Green Mountain 2", a 34-lot subdivision was received on July 14, 2025, and deemed technically complete on September 24, 2025. A public hearing is required for the development proposal and will be scheduled at a later date. A separate public hearing notice will be mailed to all property owners within 300-feet of the subject development and published in the Post Record.

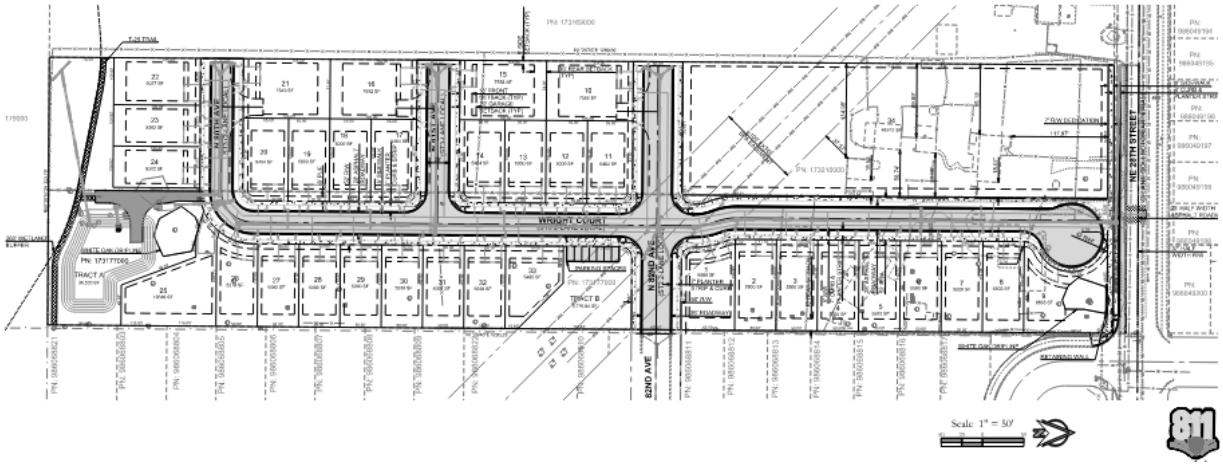
Location: The approximately 9.6-acre site is zoned Single-Family Residential (R-7.5) in the City of Camas. The site is located at 22015 & 22111 NE 28th Street in the SW ¼ of Section 21 Township 2 North, Range 3 East, Camas, WA, Parcel Numbers: 611175000, 173177000, and 173210000.

Application Materials: The application included the following: project narrative, SEPA checklist, preliminary development plans, preliminary stormwater report, critical areas report, preliminary geotechnical report, preliminary landscape plan, archeological pre-determination report, mailing labels, title report and traffic study. Application materials are available for review from the Community Development Department during regular business hours Monday – Friday 8am-5pm.

Questions/Comments: For questions related to this application, please contact Yvette Sennewald, Senior Planner, at (360) 817-1568 or by email at communitydevelopment@cityofcamas.us.

Published in the Post Record on October 9, 2025 Legal Publication # 1040950
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on October 8, 2025

Preliminary Plat for The Landing at Green Mountain 2 (SUB25-1006)



NOTICE OF APPLICATION
The Landing at Green Mountain 2
(Planning Case Number: SUB25-1006)

Consolidated Files: State Environmental Policy Act, Archaeological and Critical Area Review

NOTICE IS HEREBY GIVEN that an application for the "Landing at Green Mountain 2", a 34-lot subdivision was received on July 14, 2025, and deemed technically complete on September 24, 2025. A public hearing is required for the development proposal and will be scheduled at a later date. A separate public hearing notice will be mailed to all property owners within 300-feet of the subject development and published in the Post Record.

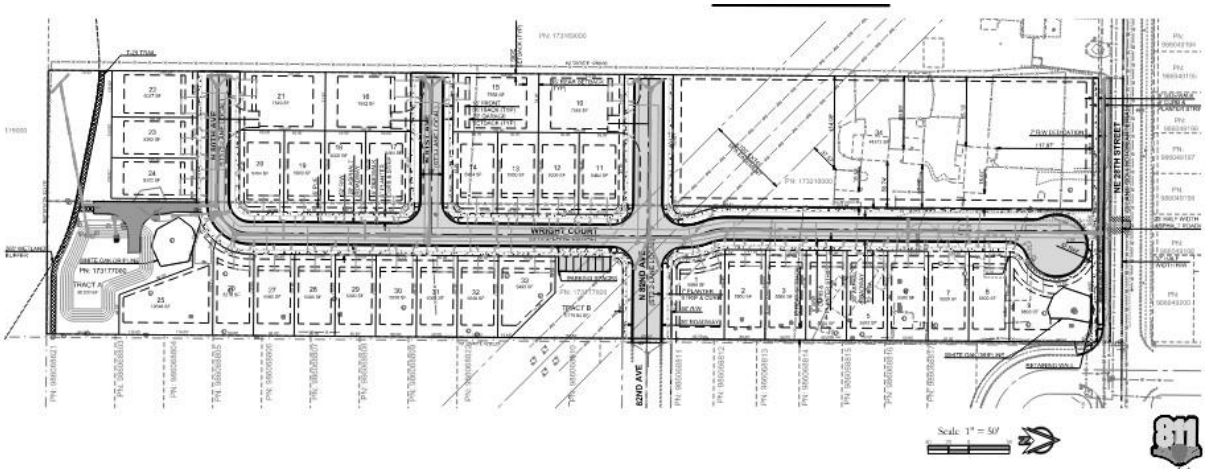
Location: The approximately 9.6-acre site is zoned Single-Family Residential (R-7.5) in the City of Camas. The site is located at 22015 & 22111 NE 28th Street in the SW ¼ of Section 21 Township 2 North, Range 3 East, Camas, WA, Parcel Numbers: 611175000, 173177000, and 173210000.

Application Materials: The application included the following: project narrative, SEPA checklist, preliminary development plans, preliminary stormwater report, critical areas report, preliminary geotechnical report, preliminary landscape plan, archeological pre-determination report, mailing labels, title report and traffic study. Application materials are available for review from the Community Development Department during regular business hours Monday – Friday 8am-5pm.

Questions/Comments: For questions related to this application, please contact Yvette Sennewald, Senior Planner, at (360) 817-1568 or by email at communitydevelopment@cityofcamas.us.

Published in the Post Record on October 9, 2025 Legal Publication # 1040950
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on October 8, 2025

Preliminary Plat for The Landing at Green Mountain 2 (SUB25-1006)



In re: The Landing at Green Mountain 2

)	NO. SUB25-1006
)	
)	AFFIDAVIT OF MAILING
)	
)	
)	
)	
)	
Respondent.)	

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on October 15, 2025, I directed a true and correct copy of the SEPA Determination of Non-Significance be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 16th day of October, 2025.

Aireanna Baldwin
Notary Public
State of Washington
My Appointment Expires 10/1/2028
Commission Number 183848

Aireanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2028

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

ELZINGA DANIEL L & JACOBS ALEXANDRA
22007 NE 28TH ST
CAMAS, WA 98607

HENDERSON TYNAN & HENDERSON HOPE
22217 NE 28TH ST
CAMAS, WA 98607

EMMERT FAMILY III LLC
10470 SE HILLCREST DR
HAPPY VALLEY, OR 97086

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

MIDDAGH LINDA
22015 NE 28TH STREET
CAMAS, WA 98607

HERTENSTEIN SKIP & HERTENSTEIN MELISSA
21919 NE 28TH ST
CAMAS, WA 98607

MERRITT ROCQUE & MERRITT SUE
3602 NE 222ND AVE
CAMAS, WA 98607

MERRITT GWENNA E
3602 NE 222ND AVE
CAMAS, WA 98607

EMMERT TERRY W
11811 SE HWY 212
CLACKAMAS, OR 97015

MURPHY JOAN FRANCES TRUSTEE
8649 N APPLETON ST
CAMAS, WA 98607

HO TUNG THANH & TRUONG LANH THI
8637 N APPLETON ST
CAMAS, WA 98607

MADDOX NICK VANCE & MADDOX JENNIFER RACHELLE
8625 N APPLETON ST
CAMAS, WA 98607

SMITH CHRISTOPHER CALVIN & SMITH MONIQUE MICHELLE
8613 N APPLETON ST
CAMAS, WA 98607

SIMMONS KIESHA M & SIMMONS CHRISTOPHER R
17014 NE 6TH ST
VANCOUVER, WA 98684

BONIFE ANDREW W & BONIFE ANDREA FAITH
6252 N 86TH AVE
CAMAS, WA 98607

LUMLEY CORBEN & LUMLEY JENNIFER
6238 N 86TH AVE
CAMAS, WA 98607

NEUDORFER KELSEY & BOCKELMAN EVAN
6226 N 86TH AVE
CAMAS, WA 98607

STUDEMAN TYLER KASEY & STUDEMAN KELLY MARIE
6214 N 86TH AVE
CAMAS, WA 98607

MITTELSTAEDT PAUL E JR & MITTELSTAEDT ELIZABETH
6202 N 86TH AVE
CAMAS, WA 98607

KUMMERMAN MICHAEL J & KUMMERMAN PAULINE VERONICA
6150 N 86TH AVE
CAMAS, WA 98607

RUTTER TROY EUGENE & RUTTER STEPHANIE DENISE
6138 N 86TH AVE
CAMAS, WA 98607

HOANG ALEXANDER TUNG & HIROMOTO KELBY AKEMI
6124 N 86TH AVE
CAMAS, WA 98607

DAHAL BIDHYA GURUNG & DAHAL LAXMI RAMAN
8602 N WRIGHT ST
CAMAS, WA 98607

BARROW ANSON DAVID & BARROW LAUNIE RAE
4331 SE 179TH CT
VANCOUVER, WA 98683

AXMAKER ANDREW & AXMAKER HOLLY
8616 N WRIGHT ST
CAMAS, WA 98607

RILER DANIEL JOSEPH & RILER MELINDA CATHERINE
8624 N WRIGHT ST
CAMAS, WA 98607

DOAN KHOA DANG & SAING STEPHANY SANPHILAY
8638 N WRIGHT ST
CAMAS, WA 98607

DVERSDAL BETTY J TRUSTEE
8643 N WRIGHT ST
CAMAS, WA 98607

XU JIAN & LIANG YUEHAI TRUSTEES
12462 NW WAKER DR
PORTLAND, OR 97229

VACA DANIEL
6221 N 86TH AVE
CAMAS, WA 98607

BUTTON SAUNDRA J & BUTTON COLTON L
6233 N 86TH AVE
CAMAS, WA 98607

PETERS TRACY LYNN
8638 N APPLETON ST
CAMAS, WA 98607

DEVERSDAL JENNIFER JEAN
8652 N APPLETON ST
CAMAS, WA 98607

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

MOY JOHN C JR
1811 NW FOREST HOME LN
CAMAS, WA 98607

BOUCHER RICHARD & BOUCHER KAREN TRUSTEES
8522 N HARGRAVE ST
CAMAS, WA 98607

PRINS BRANDON O & PRINS LINDSEY N
8510 N HARGRAVE ST
CAMAS, WA 98607

GME DEVELOPMENT LLC
1301 SE TECH CENTER DR STE 150
VANCOUVER, WA 98683

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

HENDERSON TYNAN & HENDERSON HOPE
22217 NE 28TH ST
CAMAS, WA 98607

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

RADABAUGH CAROL L KVINGE
8024 N HARGRAVE ST
CAMAS, WA 98607

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SUB25-1006 The Landing at Green Mountain 2

APPLICANT: PLS Engineering
604 W. Evergreen Boulevard
Vancouver, WA 98660

REQUEST: To subdivide approximately 9.6 acres situated in the R-7.5 – Single-Family Residential Zone into 34-lots to facilitate the future development of single-family detached residential homes.

LOCATION: 22015 & 22111 NE 28TH STREET
PARCEL NUMBERS 611175000, 173177000, AND 173210000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE SW ¼ OF SECTION 21 TOWNSHIP 2 NORTH, RANGE 3 EAST

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: OCTOBER 30, 2025, AT 5:00 P.M.

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on October 16, 2025 Legal Publication #1042060
Mailed to property owners within 300-feet on October 15, 2025
Posted on bulletin boards at Camas City Hall, Camas Library and the City of Camas web site at: http://www.cityofcamas.us

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

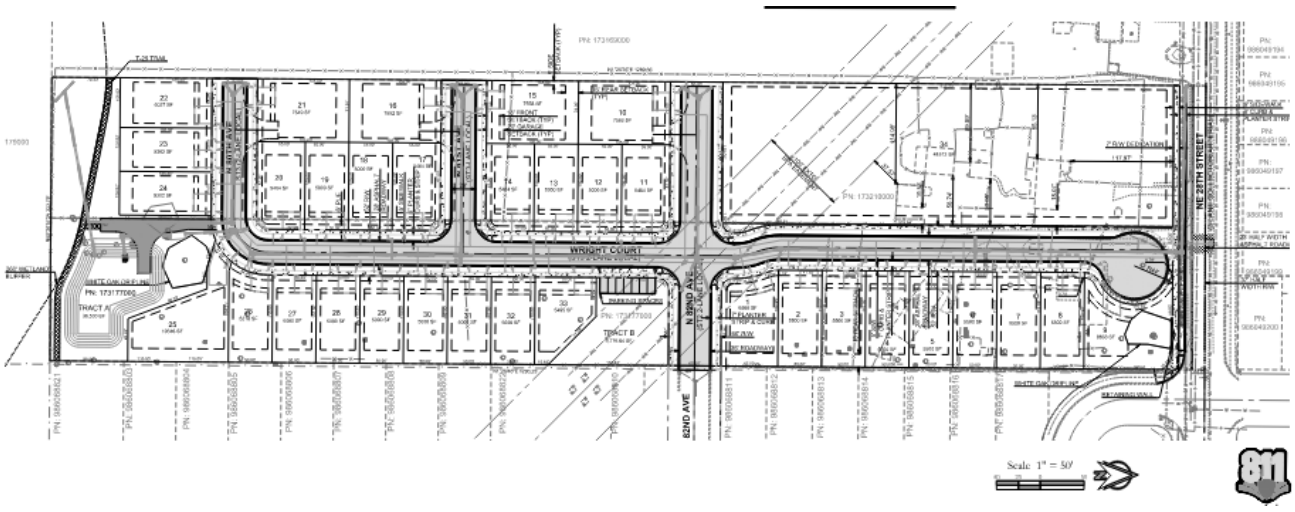
Publication date of this DNS is **October 16, 2025**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **October 30, 2025**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official	**October 16, 2025** **Date of publication**

Preliminary Plat for The Landing at Green Mountain 2 (SUB25-1006)



State Environmental Policy Act
Determination of Non-Significance

CASE NO: SUB25-1006 The Landing at Green Mountain 2

APPLICANT: PLS Engineering
604 W. Evergreen Boulevard
Vancouver, WA 98660

REQUEST: To subdivide approximately 9.6 acres situated in the R-7.5 – Single-Family Residential Zone into 34-lots to facilitate the future development of single-family detached residential homes.

LOCATION: 22015 & 22111 NE 28TH STREET
PARCEL NUMBERS 611175000, 173177000, AND 173210000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE SW ¼ OF SECTION 21 TOWNSHIP 2 NORTH, RANGE 3 EAST

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: OCTOBER 30, 2025, AT 5:00 P.M.

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on October 16, 2025 Legal Publication #1042060
Mailed to property owners within 300-feet on October 15, 2025
Posted on bulletin boards at Camas City Hall, Camas Library and the City of Camas web site at: http://www.cityofcamas.us

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **October 16, 2025**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **October 30, 2025**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

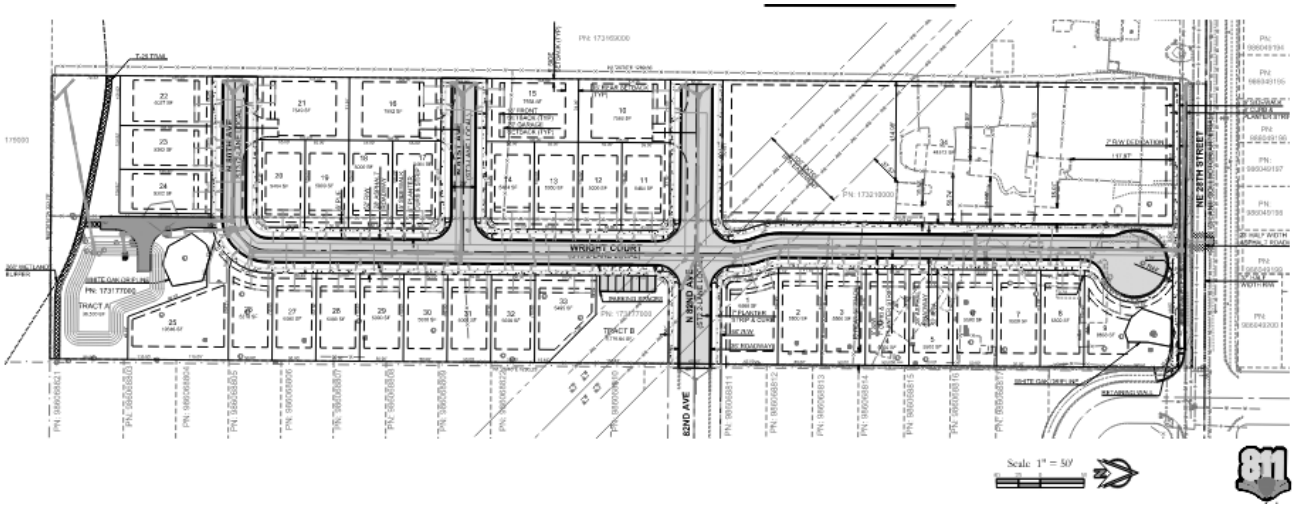
Responsible Official: Robert Maul (360) 817-1568



Robert Maul, Planning Manager and Responsible Official

October 16, 2025
Date of publication

Preliminary Plat for The Landing at Green Mountain 2 (SUB25-1006)



COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

Date Published: October 16, 2025

To Whom It May Concern:

Please find enclosed a Determination of Non-Significance (DNS) for **The Landing at Green Mountain 2 (SUB25-1006)** that was issued pursuant to the State Environmental Policy Act (SEPA) Rules, Chapter 197-11, Washington Administrative Code. The enclosed review comments reflect evaluation of the environmental checklist by the lead agency as required by WAC 197-11-330(1)(a)(i).

The following materials were submitted with the initial application:

- General application form and fee
- Applicant's narratives
- Development plans and elevations
- Traffic Report
- Tree Survey
- SEPA Checklist
- Critical Areas Report
- Preliminary Stormwater Report
- Geotechnical Report
- Easements
- Cost Estimate
- Archaeological Predetermination*

All application materials are available for review upon request from the Community Development Department. *Archaeological information is exempt from public disclosure, consistent with RCW 42.56.300.

Written comments may be submitted on this determination within fourteen (14) days of its issuance, after which the DNS will be reconsidered in light of the comments received.

Please address all correspondence to:
City of Camas, SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607
communitydevelopment@cityofcamas.us

Distribution:

Applicant
C-Tran
Camas School District
Camas Building Official, Brian Smith
Camas Engineering Department Managers and Staff
Camas Fire Department, Randy Miller
Camas Finance Director, Cathy Huber Nickerson
Camas Community Development Director, Alan Peters
Camas Mayor and City Council Members
Camas Parks and Recreation Director, Chris Witkowski
Camas Planning Manager and Staff
Camas Police Chief, Tina Jones
Camas Public Works Director, Scott Collins
Camas Public Library, Connie Urquhart
Camas-Washougal Post Record
Chinook Indian Nation
Cultural Resource Program, Cowlitz Indian Tribe
Cultural Resource Program, Yakama Indian Nation
Clark County Department of Environmental Services
Clark County Department of Transportation
Clark County Natural Resources Council
Clark Public Utilities
Department of Ecology
Department of Fish and Wildlife, Region 5
Department of Natural Resources, SEPA Center
Southwest Clean Air Agency
US Army Corps of Engineers
Vancouver - Clark Parks & Recreation
Washington Office of Archaeology & Historic Preservation
Washington State Department of Transportation
Washington State Parks and Recreation Commission, Environmental Program
Property Owners within 300 feet *(mailed the SEPA Determination & map)*

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SUB25-1006 The Landing at Green Mountain 2

APPLICANT: PLS Engineering
604 W. Evergreen Boulevard
Vancouver, WA 98660

REQUEST: To subdivide approximately 9.6 acres situated in the R-7.5 – Single-Family Residential Zone into 34-lots to facilitate the future development of single-family detached residential homes.

LOCATION: 22015 & 22111 NE 28TH STREET
PARCEL NUMBERS 611175000, 173177000, AND 173210000

LEGAL DESCRIPTION: THE PROJECT IS LOCATED IN THE CITY OF CAMAS IN THE SW ¼ OF SECTION 21 TOWNSHIP 2 NORTH, RANGE 3 EAST

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: OCTOBER 30, 2025, AT 5:00 P.M.

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on October 16, 2025 Legal Publication #1042060
Mailed to property owners within 300-feet on October 15, 2025
Posted on bulletin boards at Camas City Hall, Camas Library and the City of Camas web site at: http://www.cityofcamas.us

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **October 16, 2025**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **October 30, 2025**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

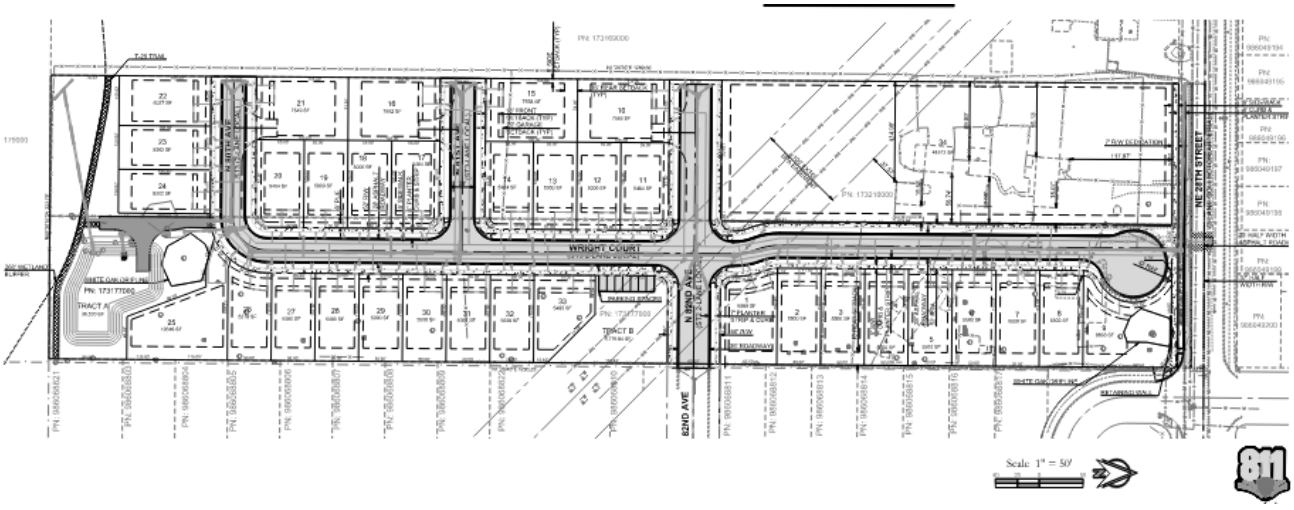
City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official

October 16, 2025
Date of publication

Preliminary Plat for The Landing at Green Mountain 2 (SUB25-1006)



Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]

Landing at Green Mountain 2 Subdivision

2. Name of applicant: [help]

Pacific Lifestyle Homes – Nick Edwards

3. Address and phone number of applicant and contact person: [help]

11815 NE 99th Street Suite 1200
Vancouver, WA 98682
360-597-7098

4. Date checklist prepared: [help]

June 12, 2025

5. Agency requesting checklist: [help]

City of Camas

6. Proposed timing or schedule (including phasing, if applicable): [help]

Development is expected to start at the time of final construction drawing approval, likely in early 2026. No phasing is proposed.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]

No, not at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]

SEPA Checklist, Archaeological Predetermination, Geotechnical Report, Critical Areas Report

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]

No, the applicant is not aware of any other applications pending for governmental approvals that affect this site.

10. List any government approvals or permits that will be needed for your proposal, if known.

- *Preliminary Type III Subdivision Review*
- *Public notification and staff report publications*

- *Final Plat Approval*
- *SEPA*
- *SWWPPP - Stormwater Pollution Prevention Plan*

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help]

The applicant proposes a 34-lot single family residential subdivision in the R-7.5 zone on 9.60 acres. One existing home will be retained on Lot 34. N 82nd Avenue will be extended from the east and new public roads will be provided to serve the site.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

The site is located at 22015 & 22111 NE 28th St. Camas, WA, in the SW 1/4 of Section 21, Township 2 North, Range 3 East of the Willamette Meridian. The site is identified as Tax Parcels 611175000, 173177000, 173210000. See the proposed development plans for a preliminary plat, grading plan, vicinity map and topographical data.

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

10%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

This site consists of:
MlA – McBee silt loam (0-3% slopes)
LgB – Lauren gravelly loam (0-8% slopes)
LeB – Lauren loam (0-8% slopes)
It is unknown if these soils are classified as agricultural or if the site contains prime farmland.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

There are no known surface indications or history of unstable soils in the immediate area.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

There will be grading for the construction of public roads, driveways, the installation of utilities, and the preparation of the site for single family residential housing. Surplus material may be required to be hauled from the site to an approved dump site or offsite fill may be required. Quantities and source are unknown at this time; these will be established with the Final Engineering Plans.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

Standard erosion control measures will be followed during grading construction on the site. A final erosion control plan will be reviewed and approved by City of Camas.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

Approximately 50%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

Proposed measures to reduce and control erosion include providing an erosion control plan for review and approval prior to starting construction on the site and following the conditions of the approved grading and erosion control plan during all phases of construction.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Construction equipment emissions and dust on the short term. Long-term emissions will be produced by automobile traffic and normal household activities, possibly including wood burning stoves and fireplaces.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

There are off-site sources of emissions from cars that travel adjacent roads. The site is near Grove Airfield, and as such may experience overhead flights, odor, vibrations, noise and other similar aviation impacts. This will not affect the proposal.

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

Dust from construction can be mitigated by sprinkling the site with water during construction as needed.

3. Water [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

Per the Critical Areas Report for the site there is an offsite Category II wetland to the south of the site. A small portion of the wetland buffer extends over the SW corner of the site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

No

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

None, no impacts are proposed to the offsite wetland.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

The proposal will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

No, the site does not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No, there will be no discharge of waste material to surface waters.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No ground water will be withdrawn with this proposal. A storm detention pond is proposed with the site development that will discharge stormwater into the nearby wetland. Storm water from pollution generating surfaces will be treated prior to being routed to the storm detention pond.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

No waste material is proposed to be discharged into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

The main source of runoff is from stormwater. There will be runoff from impervious roof area, driveways, roadways, and landscaped areas. Street catch basins, yard drains, and roof drains will connect to a pipe network that leads to the detention pond.

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

Yes, if waste materials were somehow released or dumped into surface runoff flows, substances associated with the source material could enter ground or other surface waters. There is no proposal to release waste material to the ground or to surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

Not anticipated.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

The contractor will be required to use approved erosion control measures during all phases of development in order to reduce or control runoff.

4. Plants [help]

a. Check the types of vegetation found on the site: [help]

x deciduous tree: alder, maple, aspen, **other: Oregon white oak, ash, hazelnut**
x evergreen tree: **fir**, cedar, pine, other
x shrubs
____ grass
x pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
x other types of vegetation: **blackberry**

b. What kind and amount of vegetation will be removed or altered? [help]

Much of the site vegetation will be stripped for site preparation. Trees along the south portion of the site are proposed to be retained.

c. List threatened and endangered species known to be on or near the site. [help]

There are priority habitat Oregon white oaks onsite.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

Street trees and landscaping will be provided throughout the park and open space areas. All Oregon white oaks will be preserved. The southern portion of the site will feature an open space tract that will contain the wetland buffer, stormwater facility, oak tree, and public path. This tract will be landscaped.

e. List all noxious weeds and invasive species known to be on or near the site. [help]

None known.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:
birds: **hawk**, heron, eagle, **songbirds, other:** mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

Small mammals, such as mice, voles, and rabbits are located on and near the site. This site is also in an area where larger mammals, such as raccoons, opossum, and mammals indigenous to the Clark County area are sometimes located.

b. List any threatened and endangered species known to be on or near the site. [help]

There are no known threatened or endangered species on or near the site.

c. Is the site part of a migration route? If so, explain. help]

This site is part of the Pacific Flyway for migratory waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any: [help]

The future homes will likely be landscaped with grass lawns and appealing native shrubs and trees.

e. List any invasive animal species known to be on or near the site. [help]

None known

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

The new homes on the site will be served primarily by electricity and natural gas. Wood stoves might be used for heating. Other forms of energy will depend on homeowners.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

The new homes will have energy-efficient windows and will comply with the state building codes which includes conservation measures.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

There are no known environmental health hazards that could occur as a result of this proposal.

1) Describe any known or possible contamination at the site from present or past uses. [help]

Utilizing the "What's in My Neighborhood" section of DOE's database shows that there are no cleanup sites or known hazards within 0.25 miles of the site.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

None known

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

None known

4) Describe special emergency services that might be required. [help]

No special emergency services outside those normally expected in a residential area are anticipated to be required in association with this proposal.

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

None

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example:traffic, equipment, operation, other)? [help]

Light traffic noise from surrounding areas/roads exist in the area, along with typical household noises. The site is near Grove Airfield, and as such may experience overhead flights, odor, vibrations, noise and other similar aviation impacts. None of these will affect the proposal.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site. [help]

Short term noises from this project will include construction noises which would occur only during approved hours as mandated by City of Camas and Washington State. Long-term noises could include an increase in traffic noise and normal household noises.

3) Proposed measures to reduce or control noise impacts, if any: [help]

Construction on the site will take place during normal working hours as allowed by the City of Camas.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

The proposed site has three existing single-family residences and several outbuildings onsite. To the south is Camp Currie, park land owned by Clark County. To the west of the site are single family homes on larger lots. To the east and north are residential subdivisions.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

It is unknown whether the site has a history of being used as working farmlands or forest lands.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No, the proposal will not be affected by, nor will it affect any surrounding working farm or forest land business.

c. Describe any structures on the site. [help]

Three single-family residences and several outbuildings exist onsite.

d. Will any structures be demolished? If so, what? [help]

The manufactured home on parcel 173210000 and associated outbuildings will remain on proposed lot 34. All other structures will be demolished.

e. What is the current zoning classification of the site? [help]

R7.5 – Residential

f. What is the current comprehensive plan designation of the site? [help]

SFM

g. If applicable, what is the current shoreline master program designation of the site? [help]

Not applicable, the site is not within a shoreline area.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

There are Oregon white oaks on site. A wetland buffer extends onto the SW corner of the site.

i. Approximately how many people would reside or work in the completed project? [help]

It is currently planned that this development will contain 34 lots/homes. At 2.8 people per household, there will be a total of approximately 95 people residing within this development at the time of full buildout.

j. Approximately how many people would the completed project displace? [help]

The removal of one home could displace up to 3 people.

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

The proposal will provide 33 new single-family homes.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

By complying with the zoning designation, the comprehensive plan, and the City of Camas Development Code, the proposal will be compatible with the existing and projected land uses.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

There are no known impacts.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

33 new homes are proposed, one existing home will remain. The type of proposed housing is unknown at this time.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

One unit will be eliminated.

c. Proposed measures to reduce or control housing impacts, if any: [help]

The applicant will pay all impact fees associated with the development at the time of building permit.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

All new home construction will meet City of Camas building codes for residential housing development and not exceed height limits of 35'. Exterior building materials are unknown.

b. What views in the immediate vicinity would be altered or obstructed? [help]

The site will change from large-lot single family residences to a development with 34 single family homes.

c. Proposed measures to reduce or control aesthetic impacts, if any: [help]

The future single-family homes will be landscaped with grass lawns and other appealing landscaping. The main roadway frontage will be landscaped with trees per the City of Camas roadway standards. An *open space on the south end of the site is proposed to be retained within the development*. This open space will preserve onsite trees include the trees in the wetland buffer and an Oregon white oak.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

When homes are constructed on the proposed lots, there will most likely be light produced from houses, yards, and street lights during evenings and early mornings.

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No, light or glare from the finished project will not be a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal? [help]

There are existing off-site sources of light from adjacent homes and roads, but they will not affect the proposal. The site is near Grove Airfield, and as such may experience overhead flights, odor, vibrations, noise and other similar aviation impacts.

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

Shielding of porch lights and streetlights will reduce light and glare impacts offsite.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Camp Currie park is adjacent to the south, Lacamas Heritage Trail and Camas Meadows Golf Club are located to the southwest.

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

There will be no recreational uses displaced with this proposal.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

The applicant proposes to pay all park impact fees associated with building permits. A 0.83-acre open space tract is proposed on the south end of the site that will provide recreation opportunities.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

Archaeological Services, LLC (ASCC) recommends that the ca. 1962 residence at 22111- A NE 28th Street be recorded on a Historic Property Inventory (HPI) prior to its demolition.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

There are no known landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site. An Archaeological Predetermination Survey was performed by Archaeological Services, LLC for onsite work. The onsite study found no cultural materials.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

The report utilized surface surveys and excavation of test pits, as well as reviewing historical maps and records on file at the Washington State Department of Archaeology and Historic Preservation.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

Based on the findings of the Archaeological Predetermination, no further archaeological work is needed. If during the course of construction any artifacts are discovered, all work will cease, and proper notification shall be given to City of Camas and DAHP.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

Access to the site will be from N 82nd Avenue from the east. New residential roads will be constructed to serve the development. Proposed street layouts are shown on the preliminary plat.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

C-tran does not operate in close proximity to the site. The nearest stop is at SE 192nd Avenue and Mill Plain Blvd. approximately 2.9 miles to the southwest.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

Approximately 2-4 parking spaces per single-family home are proposed. This project will eliminate approximately 4 parking spaces with the removal of two existing homes. Street parking will be allowed on one side of the proposed residential roadway.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

Frontage improvements are proposed to bring NE 28th Street up to half-width roadway standards. The construction of this project also proposes to construct internal public roadways to serve the proposed lots and provide circulation to potential future developments. See the preliminary plat for proposed roadway alignments.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help].

No

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

It is anticipated that 310 trips per day would be generated by the project. It is expected that 23 trips will occur in the AM peak hour (7:00 – 9:00 AM) and 31 trips will occur in the PM peak hour (4:00 – 6:00).

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

Not anticipated

h. Proposed measures to reduce or control transportation impacts, if any: [help]

The applicant will pay transportation impact fees.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

Yes. The completion of this development and the construction of new homes will increase the need for public services in the area.

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

This project will pay impact fees for schools, traffic, and parks at the time of building permit.

16. Utilities [help]

a. Circle utilities currently available at the site: [help]
electricity, natural gas, water, refuse service, telephone, sanitary sewer

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help]

- *Electricity: Clark Public Utilities*
- *Water: City of Camas*
- *Telephone: Century Link, Comcast*
- *Sanitary Sewer: City of Camas*
- *Natural Gas: NW Natural*

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Signed by: Nick Edwards B4B8362C57AF4B0...
Name of signee Nick Edwards
Position and Agency/Organization Land Entitlements Project Manager Pacific Lifestyle Homes
Date Submitted: 7/7/2025

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
PO Box 47775, Olympia, WA 98504-7775 • 360-407-6300

October 29, 2025

Robert Maul, Planning Manager
City of Camas
Community Development Department
616 Northeast Fourth Avenue
Camas, WA 98607

Dear Robert Maul:

Thank you for the opportunity to comment on the determination of non-significance for the The Landing at Green Mountain 2 Project (SUB25-1006) located at 22111 Northeast 28th Street as proposed by Lisa Harker. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

HAZARDOUS WASTE & TOXICS REDUCTION: Garret Peck (564) 669-0836

The applicant proposes to demolish an existing structure(s). In addition to any required asbestos abatement procedures, the applicant should ensure that any other potentially dangerous or hazardous materials present, such as PCB-containing lamp ballasts, fluorescent lamps, and wall thermostats containing mercury, are removed prior to demolition. It is important that these materials and wastes are removed and appropriately managed prior to demolition. It is equally important that demolition debris is also safely managed, especially if it contains painted wood or concrete, treated wood, or other possibly dangerous materials.

Please review the "Dangerous Waste Rules for Demolition, Construction, and Renovation Wastes," posted at Ecology's website, https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Dangerous-waste-guidance/Common-dangerous-waste/Construction-and-demolition. The applicant may also contact Katy Harvey of Ecology's Hazardous Waste and Toxics Reduction Program at katy.harvey@ecy.wa.gov for more information about safely handling dangerous wastes and demolition debris.

SOLID WASTE MANAGEMENT: Derek Rockett (360) 995-3176

All grading and filling of land must utilize only clean fill. All other materials may be considered solid waste and permit approval may be required from your local jurisdictional health department prior to filling. All removed debris resulting from this project must be disposed of at an approved site. Contact the local jurisdictional health department or Department of Ecology for proper management of these materials.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(JKT:202504359)

cc: Garret Peck, HWTR
Derek Rockett, SWM

Carey Certo

From: Emily Boutain <eboutain@cowlitz.org>
Sent: Thursday, October 30, 2025 1:40 PM
To: Community Development Email
Cc: Stone, Jessica (DAHP); Shana Lombard; James Gordon; Sean Hess
Subject: SUB25-1006 Landing at Green Mountain Comments
Attachments: Cowlitz Indian Tribe Inadvertent Discovery Plan - Revised 20 February 2024.pdf; Cultural Resource Protection Laws - Revised 29 January 2024.pdf

WARNING: This message originated outside the City of Camas Mail system. DO NOT CLICK on links or open attachments unless you recognize the sender and are expecting the content. If you recognize the sender as a city employee and you see this message this email is a phishing email. If you are unsure, click the Phish Alert button to redirect the email for ITD review.

To whom it may concern,

Given that the above-referenced project is within the Cowlitz Indian Tribe's area of concern, the Cultural Resources Department of the Cowlitz Indian Tribe would like to state its interest.

The Cultural Resources Department of the Cowlitz Indian Tribe recommends an Inadvertent Discovery Plan be attached to the permit; we have included language for your consideration.

This determination is based on all currently available knowledge and is subject to revision should new information arise. Please contact us with any questions or concerns you may have. We look forward to working with you on this undertaking.

Thank you for your time and attention.

Emily Boutain
Cultural Resources Technician
Cowlitz Indian Tribe
eboutain@cowlitz.org
(564) 220-0622

COWLITZ INDIAN TRIBE
The Forever People

This email may contain information which is protected by federal confidentiality laws (42CFR, Part 2). The information is solely for the use of the addressee named above. If you are not the intended recipient, any disclosure, copying, distribution or other use of the contents of this information is strictly prohibited. If you have received this email in error, please notify us by return email and delete this message. All Archaeological Sites are Exempt from public disclosure per RCW 42.56.300 Thank you.

COWLITZ INDIAN TRIBE

INADVERTENT DISCOVERY LANGUAGE

In the event any archaeological or historic materials are encountered during project activity, work in the immediate area (initially allowing for a 100' buffer; this number may vary by circumstance) must stop and the following actions taken:

1. Implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering; and
2. Take reasonable steps to ensure the confidentiality of the discovery site; and,
3. Take reasonable steps to restrict access to the site of discovery.

The project proponent will notify the concerned Tribes and all appropriate county, state, and federal agencies, including the Department of Archaeology and Historic Preservation. The agencies and Tribe(s) will discuss possible measures to remove or avoid cultural material, and will reach an agreement with the project proponent regarding actions to be taken and disposition of material.

If human remains are uncovered, appropriate law enforcement agencies shall be notified first, and the above steps followed. If the remains are determined to be Native, consultation with the affected Tribes will take place in order to mitigate the final disposition of said remains.

See the Revised Code of Washington, Chapter 27.53, "Archaeological Sites and Resources," for applicable state laws and statutes. See also Washington State Executive Order 21-02, "Archaeological and Cultural Resources." Additional state and federal law(s) may also apply.

It is strongly encouraged copies of inadvertent discovery language/plan are retained on-site while project activity is underway.

Contact information:

James Gordon – Tribal Historic Preservation Officer
Cowlitz Indian Tribe
PO Box 2547
Longview, WA 98632

Cellular: 360-957-3004
jgordon@cowlitz.org

Revised 20 February 2024

Cultural Resource Protection Laws

Note: This list is not all-inclusive and does not take the place of consultation. Not all laws will apply in all situations. (Revised 29 January 2024)

Federal Laws

National Historic Protection Act (NHPA)	36 CFR 60	https://www.achp.gov/sites/default/files/regulations/2017-02/regs-rev04.pdf
Native American Graves Protection and Repatriation Act (NAGPRA)	43 CFR 10	https://www.nps.gov/subjects/nagpra/compliance.htm
Executive Order 13175 – Consultation and Coordination with Indian Tribal Governments		https://www.federalregister.gov/documents/2000/11/09/00-29003/consultation-and-coordination-with-indian-tribal-governments

Washington State Laws

Archaeological Sites and Resources	27.53 RCW	https://apps.leg.wa.gov/RCW/default.aspx?cite=27.53
Executive Order 21-02		https://governor.wa.gov/sites/default/files/exe_order/eo_21-02.pdf
Notice of Forest Practices to Affected Indian Tribes	WAC 222-20-120	https://apps.leg.wa.gov/WAC/default.aspx?cite=222-20-120

Oregon State Laws

Indian Graves and Protection Act	ORS 97.740-S 97.760	https://oregon.public.law/statutes/ors_chapter_97
Archaeological Objects and Sites	ORS 358.905 - 358.995	https://oregon.public.law/statutes/ors_chapter_358

State of Washington
DEPARTMENT OF FISH AND WILDLIFE
Southwest Region 5 • 5525 South 11th Street, Ridgefield, WA 98642
Telephone: (360) 696-6211

October 30, 2025

City of Camas, SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, WA 98607

Dear SEPA Official:

Thank you for the opportunity to comment on **The Landing at Green Mountain 2 (SUB25-1006)** project. The Washington Department of Fish and Wildlife (WDFW) has reviewed this proposal and offers the following comments for your consideration.

Our primary concern for this project is the impact to the critical areas on site, particularly the 28-inch dbh Oregon white oak (OWO) tree proposed for removal. We offer our best management recommendations and most recent guidance for Oregon white oak mitigation.

Oregon white oaks (OWO)

As acknowledged in the *Critical Areas Report & Mitigation Plan* ("Mitigation Plan") authored by AshEco Solutions, LLC, on July 1, 2025, WDFW considers Oregon white oak (OWO) woodland to be a type of priority habitat per our agency's Priority Habitats and Species (PHS) List, and even a single OWO tree can qualify as OWO woodland habitat if located in an urban or urbanizing area. OWO provide valuable food and habitat for many native Washington animal species, including migratory birds (rufous hummingbirds, band-tailed pigeons, chipping sparrows, and more), nuthatches, woodpeckers, raptors, squirrels, and a wide array of invertebrates, including oak-obligate species. OWO take decades to reach maturity, and once established, oak trees can live for hundreds of years, providing immense benefits for local ecological communities. WDFW's *Best management practices for mitigating impacts to Oregon white oak habitat* ("WDFW Oak Guidance") (Nolan & Azerrad 2024) provides the most current guidance for avoiding, minimizing, and mitigating for impacts to OWO.

We appreciate that the project proponent has identified the presence of five individual Oregon white oak trees onsite, and that, as stated in the Mitigation Plan, they intend to avoid and minimize impacts to the oak trees "to the full extent practicable while still meeting the required design elements." We also commend the decision to consult with an ISA-certified arborist to understand the condition of each tree and the dimensions of each tree's critical root zone and canopy structure. The arborist's observation that Oak #47's root system is intertwined with that of the adjacent Oregon ash trees was a prudent consideration to include in the project plan.

As a point of clarification, the WDFW PHS definition of OWO woodland priority habitat does not specify that an individual tree in an urban or urbanizing area must have a trunk diameter (dbh) of 20 inches or

more in order to be considered particularly valuable to fish and wildlife. It is true that larger trees can often be expected to provide more habitat functions, but we still recommend that the habitat value of smaller trees be considered as well. The WDFW Oak Guidance provides mitigation guidelines for trees with 6-in dbh and above.

OWO Physical Mitigation

The proposed Mitigation Plan explains that the planting of 50 OWO saplings will be conducted to offset the impact of removing a 28-inch OWO (Oak #47). To align with WDFW guidance for achieving no net loss of OWO function, this calculation would have be increased to 200 OWO saplings: "For trees between 24 - 30 inches dbh, use a tree replacement ratio of 200:1" (pg 18, Nolan & Azerrad 2024). This recommended planting ratio is notably greater than the 10:1 planting ratio referenced in the Mitigation Plan; the lesser ratio was indicated in a past WDFW guidance document (from 1998), but has been updated to the higher replacement ratio indicated in the 2024 WDFW Oak Guidance (Nolan & Azerrad 2024). Again, these updates were made to reflect best available science for the preservation and mitigation of OWO habitat function. We recommend that oak saplings be planted at a density equivalent to 500 saplings/acre or less, and planted alongside oak woodland understory species.

OWO Temporal Mitigation

Since oak saplings cannot provide the same ecosystem functions as mature oak trees until several decades after planting, there will be a temporal lag before habitat functions can be fully restored after sapling planting. To address this gap, WDFW's recommendation is to enhance existing OWO habitat as a means of "temporal mitigation", in addition to planting saplings ("physical mitigation"). WDFW's Oak Guidance provides suggestions for OWO habitat enhancement measures, including the reestablishment of a native understory and canopy release in pre-existing OWO woodland habitat.

WDFW guidance indicates that OWO habitat enhancement at a 10:1 area ratio (based on canopy area) would be sufficient for temporal mitigation for the loss of a high-functioning OWO tree. Notably, this area calculation is distinct from the area required for oak sapling plantings. Planting and enhancement areas may be located adjacent to each other (and even pieced together in a patchwork scheme), but these areas should not be considered one in the same when determining how much area is necessary for mitigation. Considering these guidelines, a 9900-sqft area may be insufficient for both the physical and temporal mitigation necessary for the removal of Oak #47, which has an 875-ft canopy and will require the planting of 200 saplings (as explained above).

I am happy to provide technical assistance for any questions on selection of native plants and/or additional measures to protect the Oregon white oaks on site, with the goal of ensuring that this project achieves to net loss of ecological function.

Thank you for the opportunity to provide input.

Sincerely,

Joy Peplinski

Joy Peplinski, Habitat Biologist
Washington Department of Fish & Wildlife

In re: The Landing at Green Mountain 2

) NO. SUB25-1006
)
) AFFIDAVIT OF MAILING
)
)
)
)
)
Respondent.)

STATE OF WASHINGTON)
) ss.
CLARK COUNTY)

I, Carey Certo, on oath says:

I, Carey Certo, on November 19, 2025, I directed a true and correct copy of the Notice of Public Hearing be served upon the parties herein, in the above-entitled action, by depositing with the U.S. Post Office, Camas, Washington, a postage-prepaid envelope containing same addressed as follows: See attached list.

Carey Certo
SIGNATURE

SUBSCRIBED and SWORN to before me this 20th day of November, 2025.

Alreanna Baldwin
Notary Public
State of Washington
My Appointment Expires 10/1/2028
Commission Number 183848

Alreanna Baldwin
Notary Public in and for the State of Washington, residing at Clark County
My appointment expires: 10/1/2028

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

ELZINGA DANIEL L & JACOBS ALEXANDRA
22007 NE 28TH ST
CAMAS, WA 98607

HENDERSON TYNAN & HENDERSON HOPE
22217 NE 28TH ST
CAMAS, WA 98607

EMMERT FAMILY III LLC
10470 SE HILLCREST DR
HAPPY VALLEY, OR 97086

CLARK COUNTY PARKS
4700 NE 78TH ST
VANCOUVER, WA 98665

MIDDAGH LINDA
22015 NE 28TH STREET
CAMAS, WA 98607

HERTENSTEIN SKIP & HERTENSTEIN MELISSA
21919 NE 28TH ST
CAMAS, WA 98607

MERRITT ROCQUE & MERRITT SUE
3602 NE 222ND AVE
CAMAS, WA 98607

MERRITT GWENNA E
3602 NE 222ND AVE
CAMAS, WA 98607

EMMERT TERRY W
11811 SE HWY 212
CLACKAMAS, OR 97015

MURPHY JOAN FRANCES TRUSTEE
8649 N APPLETON ST
CAMAS, WA 98607

HO TUNG THANH & TRUONG LANH THI
8637 N APPLETON ST
CAMAS, WA 98607

MADDOX NICK VANCE & MADDOX JENNIFER RACHELLE
8625 N APPLETON ST
CAMAS, WA 98607

SMITH CHRISTOPHER CALVIN & SMITH MONIQUE MICHELLE
8613 N APPLETON ST
CAMAS, WA 98607

SIMMONS KIESHA M & SIMMONS CHRISTOPHER R
17014 NE 6TH ST
VANCOUVER, WA 98684

BONIFE ANDREW W & BONIFE ANDREA FAITH
6252 N 86TH AVE
CAMAS, WA 98607

LUMLEY CORBEN & LUMLEY JENNIFER
6238 N 86TH AVE
CAMAS, WA 98607

NEUDORFER KELSEY & BOCKELMAN EVAN
6226 N 86TH AVE
CAMAS, WA 98607

STUDEMAN TYLER KASEY & STUDEMAN KELLY MARIE
6214 N 86TH AVE
CAMAS, WA 98607

MITTELSTAEDT PAUL E JR & MITTELSTAEDT ELIZABETH
6202 N 86TH AVE
CAMAS, WA 98607

KUMMERMAN MICHAEL J & KUMMERMAN PAULINE VERONICA
6150 N 86TH AVE
CAMAS, WA 98607

RUTTER TROY EUGENE & RUTTER STEPHANIE DENISE
6138 N 86TH AVE
CAMAS, WA 98607

HOANG ALEXANDER TUNG & HIROMOTO KELBY AKEMI
6124 N 86TH AVE
CAMAS, WA 98607

DAHAL BIDHYA GURUNG & DAHAL LAXMI RAMAN
8602 N WRIGHT ST
CAMAS, WA 98607

BARROW ANSON DAVID & BARROW LAUNIE RAE
4331 SE 179TH CT
VANCOUVER, WA 98683

AXMAKER ANDREW & AXMAKER HOLLY
8616 N WRIGHT ST
CAMAS, WA 98607

RILER DANIEL JOSEPH & RILER MELINDA CATHERINE
8624 N WRIGHT ST
CAMAS, WA 98607

DOAN KHOA DANG & SAING STEPHANY SANPHILAY
8638 N WRIGHT ST
CAMAS, WA 98607

DVERSDAL BETTY J TRUSTEE
8643 N WRIGHT ST
CAMAS, WA 98607

XU JIAN & LIANG YUEHAI TRUSTEES
12462 NW WAKER DR
PORTLAND, OR 97229

VACA DANIEL
6221 N 86TH AVE
CAMAS, WA 98607

BUTTON SAUNDRA J & BUTTON COLTON L
6233 N 86TH AVE
CAMAS, WA 98607

PETERS TRACY LYNN
8638 N APPLETON ST
CAMAS, WA 98607

DEVERSDAL JENNIFER JEAN
8652 N APPLETON ST
CAMAS, WA 98607

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

GREEN MOUNTAIN PH2 SOUTH HOA
11807 NE 99TH ST STE 1170
VANCOUVER, WA 98682

MOY JOHN C JR
1811 NW FOREST HOME LN
CAMAS, WA 98607

BOUCHER RICHARD & BOUCHER KAREN TRUSTEES
8522 N HARGRAVE ST
CAMAS, WA 98607

PRINS BRANDON O & PRINS LINDSEY N
8510 N HARGRAVE ST
CAMAS, WA 98607

GME DEVELOPMENT LLC
1301 SE TECH CENTER DR STE 150
VANCOUVER, WA 98683

GREEN MOUNTAIN ESTATES HOA
604 EVERGREEN BLVD
VANCOUVER, WA 98660

HENDERSON TYNAN & HENDERSON HOPE
22217 NE 28TH ST
CAMAS, WA 98607

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

RADABAUGH CAROL L KVINGE
8024 N HARGRAVE ST
CAMAS, WA 98607

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

PACIFIC LIFESTYLE HOMES INC
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

THE LANDING AT GREEN MOUNTAIN HOA
11815 NE 99TH ST STE 1200
VANCOUVER, WA 98682

Community Development Department

Notice of Public Hearing

The Landing at Green Mountain 2 Subdivision

Planning Case SUB25-1006

A public hearing will be held on **Tuesday, December 9, 2025, at 5:00 p.m.,** or soon thereafter, before the City's Hearings Examiner to consider the preliminary plat application for The Landing at Green Mountain 2 Subdivision. The public hearing will be held remotely and in person at city hall. The applicant proposes to subdivide two existing lots totaling approximately 9.6-acres into 34-single-family residential lots. The site is situated in the R-7.5 – Single Family Residential Zone and is located at 22015 & 22111 NE 28th Street in the SW ¼ of Section 21, Township 2 North, Range 3 East; Camas, WA. Parcel Numbers 611175000, 173177000, and 173210000. The application was determined technically complete on September 24, 2025.

Questions/Comments: The public hearing will follow the quasi-judicial process described within Camas Municipal Code §18.55.180. Comments related to this development may be submitted as follows: (1) in person by testifying at the public hearing; (2) by regular mail to Community Development Department staff, Yvette Sennewald, Senior Planner, at Camas City Hall, 616 Northeast Fourth Avenue, Camas, WA 98607; (3) by phone at (360) 817-1568; or (4) by email to: communitydevelopment@cityofcamas.us. It is preferable that written comments be received at least five working days prior to the public hearing, in order to be available with the online agenda and materials. After the agenda has been posted online, all other written comments must be received no later than noon (12:00 p.m.) the day of the hearing, in order for those comments to be handed to the Hearings Examiner by Staff. Written and oral comments may also be submitted in person during the hearing.

Application Materials: The application included the following: project narrative, development plans and environmental reports, as required for a complete application pursuant to Camas Municipal Code (CMC) §18.55.110. The application materials are available for viewing at the Community Development Department (616 NE 4th Avenue, Camas, WA) during regular business hours Monday – Friday 8 a.m-5 p.m.

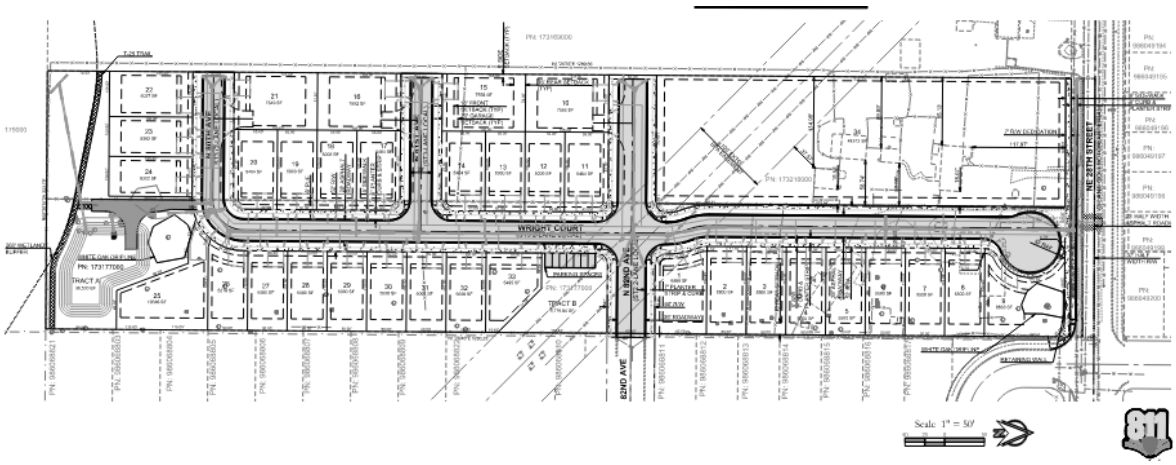
Participate: All citizens are entitled to have equal access to the services, benefits and programs of the City of Camas. Please contact the **City Clerk at (360) 817-1591** for special accommodations if needed. The city will provide translators for non-English speaking persons who request assistance at least three working days prior to a public meeting or hearing.

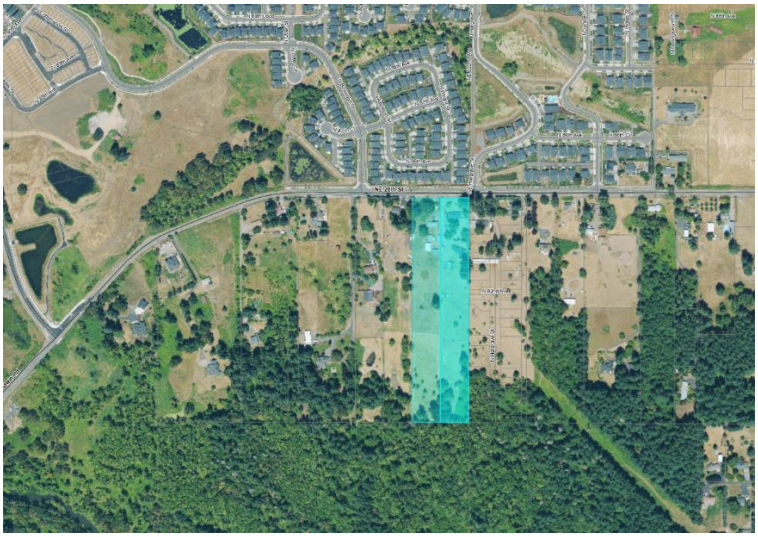
More Information: The public hearing agenda and supporting documents will be available for review on the City's website at the "Minutes, Agendas & Videos" link within the drop-down menu that is labeled "Your Government" or follow this link: http://www.cityofcamas.us/yourgovernment/minuteagendavideo.

Published in the Post Record on November 20, 2025 Legal Publication #1049790
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on November 19, 2025

Proposed Preliminary Plat

The Landing at Green Mountain 2 Subdivision (Planning Case SUB25-1006)





Community Development Department

Notice of Public Hearing

The Landing at Green Mountain 2 Subdivision

Planning Case SUB25-1006

A public hearing will be held on **Tuesday, December 9, 2025, at 5:00 p.m.,** or soon thereafter, before the City's Hearings Examiner to consider the preliminary plat application for The Landing at Green Mountain 2 Subdivision. The public hearing will be held remotely and in person at city hall. The applicant proposes to subdivide two existing lots totaling approximately 9.6-acres into 34-single-family residential lots. The site is situated in the R-7.5 – Single Family Residential Zone and is located at 22015 & 22111 NE 28th Street in the SW ¼ of Section 21, Township 2 North, Range 3 East; Camas, WA. Parcel Numbers 611175000, 173177000, and 173210000. The application was determined technically complete on September 24, 2025.

Questions/Comments: The public hearing will follow the quasi-judicial process described within Camas Municipal Code §18.55.180. Comments related to this development may be submitted as follows: (1) in person by testifying at the public hearing; (2) by regular mail to Community Development Department staff, Yvette Sennewald, Senior Planner, at Camas City Hall, 616 Northeast Fourth Avenue, Camas, WA 98607; (3) by phone at (360) 817-1568; or (4) by email to: communitydevelopment@cityofcamas.us. It is preferable that written comments be received at least five working days prior to the public hearing, in order to be available with the online agenda and materials. After the agenda has been posted online, all other written comments must be received no later than noon (12:00 p.m.) the day of the hearing, in order for those comments to be handed to the Hearings Examiner by Staff. Written and oral comments may also be submitted in person during the hearing.

Application Materials: The application included the following: project narrative, development plans and environmental reports, as required for a complete application pursuant to Camas Municipal Code (CMC) §18.55.110. The application materials are available for viewing at the Community Development Department (616 NE 4th Avenue, Camas, WA) during regular business hours Monday – Friday 8 a.m-5 p.m.

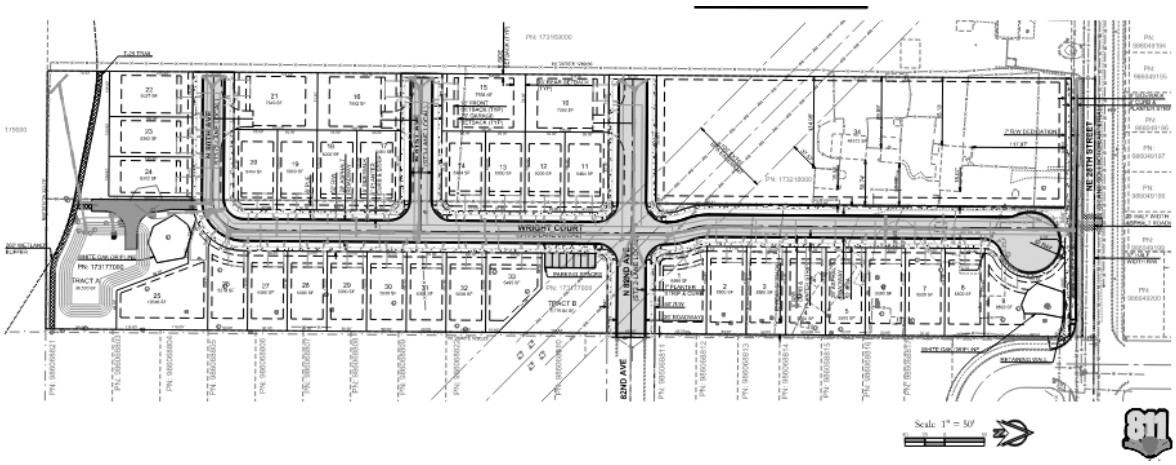
Participate: All citizens are entitled to have equal access to the services, benefits and programs of the City of Camas. Please contact the **City Clerk at (360) 817-1591** for special accommodations if needed. The city will provide translators for non-English speaking persons who request assistance at least three working days prior to a public meeting or hearing.

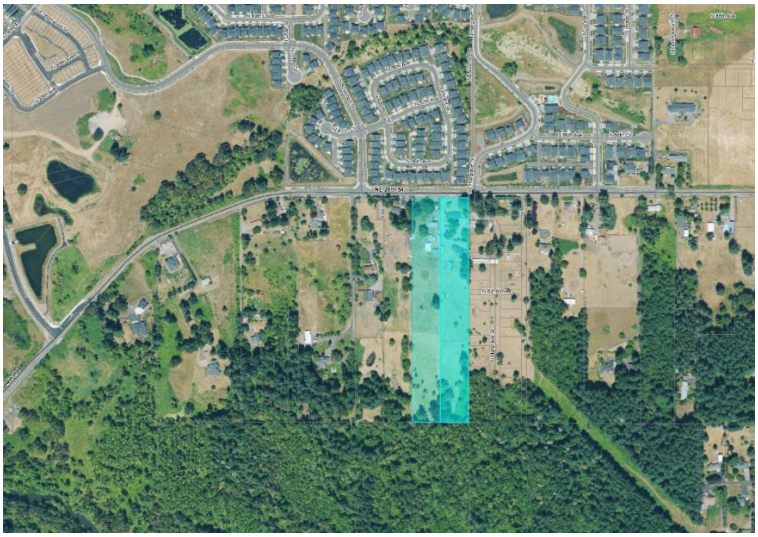
More Information: The public hearing agenda and supporting documents will be available for review on the City's website at the "Minutes, Agendas & Videos" link within the drop-down menu that is labeled "Your Government" or follow this link: http://www.cityofcamas.us/yourgovernment/minuteagendavideo.

Published in the Post Record on November 20, 2025 Legal Publication #1049790
Posted at Camas City Hall, Camas Library, City of Camas website at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on November 19, 2025

Proposed Preliminary Plat

The Landing at Green Mountain 2 Subdivision (Planning Case SUB25-1006)





The Landing at Green Mountain 2 (SUB25-1006)
Index of Exhibits

Exhibit No.	Title/Description	Document Date
1	Applicants Narrative	7/2025
2	Pre-Application Conference Notes	10/3/24
3	Transportation Impact Study	4/23/25
4	Geotechnical Report	6/2025
5	Clark County Public Health Review Letter	6/13/25
6	Mailing Labels	6/17/25
7	Tree Survey	6/28/25
8	Title Report – Emmert	4/13/22
9	Title Report - Middagh	10/21/13
10	Critical Areas Report	7/1/25
11	SEPA Checklist	7/7/25
12	Preliminary Plat	
13	Utility Plan	
14	Preliminary Grading Plan	
15	Existing Conditions	
16	Landscape Plan	
17	Preliminary Stormwater Plan & Technical Information Report	8/2025
18	Welcome Letter	8/13/25
19	Applicants Response to Review Letter	8/18/25
20	Second Review Letter	9/18/25
21	Technically Complete Letter	9/24/25
22	Development Sign Posting Confirmation	11/26/25
23	Affidavit of Mailing Notice of Application	10/8/25
24	Notice of Application	10/9/25
25	Affidavit of Mailing SEPA Determination of Non-Significance	10/15/25
26	SEPA Determination of Non-Significance Notice	10/16/25
27	SEPA Distribution Packet	10/16/25
28	Department of Ecology Public Comment	10/29/25
29	Cowlitz Indian Tribe Public Comment	10/30/25
30	Department of Fish & Wildlife Public Comment	10/30/25
31	Affidavit of Mailing Notice of Public Hearing	11/19/25
32	Notice of Public Hearing	11/20/25