Town of Cortland

Planning Commission Meeting

Town Hall, 59 S. Somonauk Road Cortland, IL 60112

December 04, 2025 at 7:00 PM

AGENDA

CALL TO ORDER / PLEDGE OF ALLEGIANCE / ROLL CALL

APPROVAL OF AGENDA

PUBLIC WISHING TO SPEAK

APPROVAL OF MINUTES

1. Approve Planning Commission Minutes of July 18, 2024

PUBLIC HEARING

2. SolarStone Partners, applicant, has filed with the Town of Cortland a request for a Special Use Permit, regarding property located north of IL Route 38, and south of the Union Pacific Railroad, De Kalb County, IL (80.33 ac) PINs 09-27-100-002 and 09-27-300-004, to Construct, Operate and Maintain a Solar Garden as set forth in Title 9, Chapter 4, Section 34 of the Cortland Town Code.
3. Town of Cortland, as the Applicant, has filed a request for text amendments in Title 4, Title 5, and Title 9 in the Cortland Town Code to allow keeping of domesticated hens.

STAFF REPORTS

REPORT OF THE CHAIR

COMMISSSIONER'S REPORT

LAISON REPORT

UNFINISHED BUSINESS FOR DISCUSSION AND POSSIBLE ACTION

NEW BUSINESS FOR DISCUSSION AND POSSIBLE ACTION

4. Determination of January 2026 Meeting Date

ADJOURNMENT

Town of Cortland

Planning Commission Meeting

Town Hall, 59 S. Somonauk Road Cortland, IL 60112

July 18, 2024

MINUTES

CALL TO ORDER / PLEDGE OF ALLEGIANCE / ROLL CALL

Mr. Hedrick called the meeting to order at 7:03 p.m. The Pledge of Allegiance was recited. Clerk Cheryl Aldis called the roll showing as present, Commissioners Mark Hedrick, Robert Barnhart, Vicky Torres, Julie Steadman, and Joelle Morken. Shown as absent were Brad Lawson and Alex Haughee. Quorum was present. Also, present was Brandy Williams, Zoning Administrator.

APPROVAL OF AGENDA

Mr. Barnhart moved to approve the agenda as presented, seconded by Ms. Morken.

Voice vote carried the motion.

PUBLIC WISHING TO SPEAK

No public wishing to speak unrelated to the Public Hearings.

APPROVAL OF MINUTES

1. Approve Minutes of May 2, 2024

   Mr. Barnhart moved to approve the minutes of May 2, 2024, seconded by Ms. Morken. Voice vote carried the motion.

PUBLIC HEARING

2. **Natural Polymers, LLC 14438 North Ave, Cortland, IL PIN 09-28-100-016; Applicant has filed with the Town of Cortland a request for a map amendment of district boundaries in accordance with Title 9, Chapter 3, of the Cortland Town Code subject to approval of annexation.**

   Chair Hedrick opened the public hearing at 7:05 p.m. Shown as present were Commissioners Mark Hedrick, Robert Barnhart, Vicky Torres, Julie Steadman, and Joelle Morken. Shown as absent were Brad Lawson and Alex Haughee. Quorum was present. Also, present was Brandy Williams, Zoning Administrator.

   Clerk Aldis read the public hearing notice into the record. The notice was published in the *Daily Chronicle* June 27, 2024, meeting the requirements of the law.

   Swear in those wishing to testify

   Chair Hedrick swore in Brandy Williams, Zoning Administrator

   Applicant Testimony

   The applicant was not present.

Public Testimony

There was no public testimony.

Staff Report

Ms. Willams read her staff report into the record and further stated that there has been no correspondence received regarding this hearing.

She reported that the property is located on East North Avenue, and the use will remain the same as currently conducted. This property is a joint annexation and rezoning application. The Town Board will take action with regard to annexation. That portion does not fall within the purview of the Planning Commission. The current zoning designation is MC Commercial with Farm. The requested zoning is I-1 Light industrial as set forth in Title 9, Chapter 3 of the Cortland Town Code, subject to annexation. She reported they have been performing interior improvements to the building which require additional fire suppression. They are currently private well and septic system utilities. This request for annexation is advantageous to the Town in increased property values. The proposal has no impact on roads or utilities.

Chair Hedrick closed the public hearing at 7:16 p.m.

Findings of Fact

a. **Existing use(s) and zoning of the property in question.**

The Subject Property is improved with a large industrial building and farmed acreage, zoned County Zoning MC Commercial with Farm.

b. **Existing use(s) and zoning of other lots in the vicinity of the property in question.**

The land to the west and north are zoned I-1 Light Industrial and used as the LRS facility and Town yard, respectively. The lands to the east are zoned P-1 Recreation & Open Space and used as a drive for the applicant's facility and the Town Wastewater Treatment Plant is zoned P-1 Recreation & Open Space and used as a recreational area with open water.

c. **Suitability of the property in question for uses already permitted under existing regulations.**

Due to the annexation petition, existing regulations are not applicable. The subject property current use would not align with the Town's default zoning of agriculture (AG).

d. **Suitability of the property in question for the proposed use.**

The applicant intends to continue to use the property facilitating the same day to day operation as the past several years. No significant improvements are required to continue such use. The property is suitable for the proposed use.

e. **The trend of development in the vicinity of the property in question, including changes (if any) which may have occurred since the property was initially zoned or last rezoned.**

There have been no recent changes in zoning or use adjacent to the subject property.

f. **The effect the proposed amendment would have on implementation of this Municipality's Comprehensive Plan.**

Approval of the rezoning request would be in concurrence with the Future Land Use Map included in the Comprehensive Plan

Ms. Torres moved, and Ms. Morken seconded the motion to approve the Findings of Fact as amended; removing language in item b "and used as a recreational area with open water."

Yeas: Commissioners Torres, Morken, Hedrick, Barnhart and Steadman
Nays: None
Absent: Commissioners Haughee and Lawson
Roll call vote: 5-yea, o-nay, 2-absent, motion carried.

Recommendation

Mr. Barnhart made a motion to recommend the Town Board approve the request to rezone the property currently known as 14438 North Street, Cortland, IL.; PIN 09-28-100-016 from its present classification of County Zoning MC Commercial with Farm to Town of Cortland I-1 Light Industrial, subject to annexation. Ms. Morken seconded the motion.

Roll call vote as follows:

Yeas: Commissioners Vicky Torres, Joelle Morken, Robert Barnhart, Mark Hedrick, and Julie Steadman
Nays: None
Absent: Commissioners Brad Lawson and Alex Haughee
Roll call vote: 5-yea, o-nay, 2-absent, motion carried.

The recommendation of conditional approval of the proposed rezoning shall be forwarded to the Town Board for consideration at its July 22, 2024, meeting.

PUBLIC HEARING

3. **50 W Maple Ave, Cortland, IL; the Town has submitted a request for a Special Use Permit in accordance with Title 9, Chapter 10 of the Cortland Town Code The Town is requesting a Special User Permit for a government building on the subject property currently zoned R-1 Single Family Residence**

   Chair Hedrick opened the public hearing at 7:28 p.m.

Shown as present were Commissioners Mark Hedrick, Robert Barnhart, Vicky Torres, Julie Steadman, and Joelle Morken. Shown as absent were Brad Lawson and Alex Haughee. Quorum was present. Also present was Brandy Williams, Zoning Administrator.

Clerk Aldis read the public hearing notice into the record. The notice was published in the *Daily Chronicle* June 22, 2024, meeting the requirements of the law.

Swear in those wishing to testify

Ms. Williams remains sworn from previous hearing.

Applicant Testimony

The Town is the applicant. Ms. Williams stated upon acquisition by quit claim deed, discussions began on the best use of the building. In the FY 25 budget monies were allocated for a phase of work, first establishing the building for the police department. There could be two more phases, demolition of the original 2-story building and offices for town staff.

Ms. Williams reviewed her advisory report with the commission. She stated that any government building requires a Special Use per Town Code. The Standards for Review are in accordance with Title 9, Chapter 10, Section 6.

Public Testimony

There was no public testimony.

Staff Report

Ms. Williams reports that the building is approximately 22,000 square feet. The use conforms with the future land use plan as a public institution. Work needed for upgrades are a new natural gas service, electrical service, water and sewer would have no changes. The parking lot would require upgrades. Police officers would park on the west side of the building.

Deliberations

Ms. Morken inquired how the zoning became R-1.

Response: This zoning was established with the original 1965 Zoning Ordinance.

Which part of the building would be the police department?

Response: west half.

Why would they need that much space?

Response: sally port, holding cells, booking and evidence. Only the original 2-story building would be demolished. The two classrooms, kitchen, and gym would become the town hall. The far west side is phase 1, PD training, mechanical and restrooms.

Ms. Steadman inquired about the time frame for full phasing.

Response: funding and desire will drive the completion.

What about broken windows?

Response: When windows are repaired, and the building is occupied the boarding will come down.

Fencing the area was discussed. Fenced areas are to be determined.

Rear of the building and south side is anticipated for parking.

Chair Hedrick closed the public hearing at 8 p.m.

Review of Standards

9-10-3 – Standards Upon Which Review Should be Taken

A special use permit shall be granted only if evidence is presented to establish that:

A. The proposed structure or use at the particular location requested is necessary or desirable to provide a service or a facility which is in the interest of the public and will contribute to the general welfare of the neighborhood or community;

The Planning Commission agrees that the use at the particular location requested is desirable to provide a service or a facility which is in the interest of the public and will contribute to the general welfare of the neighborhood or community by renovating a vacant building.

B. The proposed structure or use will not have a substantial adverse effect upon the adjacent property, the character of the neighborhood, traffic conditions, utility facilities and other matters affecting the public health, safety and general welfare;

The Planning Commission agrees the proposed use will not have a substantial adverse effect upon the adjacent property, the character of the neighborhood, traffic conditions, utility facilities and other matters affecting the public health, safety and general welfare. The proposed use does not require significant infrastructure as the use is similar to the originally intended use, and elementary school.

C. The proposed structure or use will be designed, arranged and operated so as to permit the development and use of neighboring property in accordance with the applicable district regulations;

The Planning Commission agrees this standard would be met.

D. Such other standards and criteria as are established by the ordinance for a particular special use as set forth in section 9-10-4 of this chapter and as applied to planned developments as set forth in chapter 7 of this title (Ord. 2008-03, 1-28-2008) – NOT APPLICABLE

The Planning Commission deemed this standard is not applicable.

Mr. Barnhart moved to approve the standards as stated, seconded by Ms. Steadman.

Yeas: Commissioners Vicky Torres, Joelle Morken, Robert Barnhart, Mark Hedrick, and Julie Steadman

Nays: None

Absent: Commissioners Brad Lawson and Alex Haughee

Roll call vote: 5-yea, 0-nay, 2 absent, motion carried.

Review of Conditions

9-10-5 – Conditions

The plan commission may recommend, and the town board may impose such conditions or restrictions upon the location, construction, design and operation of a special use including, but not limited to, provisions for off street parking spaces and the duration of such permit, as they shall respectively find necessary or appropriate to secure compliance with the purpose and intent of this title and other standards set forth herein. (Ord. 2008-03, 1-28-2008)

The Planning Commission deemed the following condition to be considered. If fencing is required or desired, recommend the fencing be allowed only in the rear yard to the extent required.

Mr. Barnhart moved to approve the recommended condition, seconded by Ms. Steadman.

Unanimous voice vote carried the motion.

Recommendation

Ms. Steadman moved to approve the request for a Special Use Permit for a Government Building located at 50 W Maple Ave; PIN 09-29-176-003 with the condition if fencing is required or desired, the fencing be allowed only in the rear yard to the extent required. Mr. Barnhart seconded the motion.

Yeas: Commissioners Joelle Morken, Mark Hedrick, Vicky Torres, Robert Barnhart, and Julie Steadman

Nays: None

Absents: Commissioners Brad Lawson and Alex Haughee

Roll call vote of 5-yea, 0-nay, 2 absent. The motion carried.

The recommendation of a request for a Special Use Permit for a Government Building shall be forwarded to the Town Board for consideration at its July 22, 2024, meeting.

PUBLIC HEARING

4. **Chestnut Grove Subdivision 14 Lots on East Ashford Ave, PINs 09-33-181-001 through 09-33-181-014, Cortland, IL; The Town has submitted a request for a map amendment of district boundaries in accordance with Title 9, Chapter 3 of the Cortland Town Code..The Town is requesting rezoning of the subject properties**

from R-3 Two-Family Residence with a Special Use Permit to P-1 Recreation & Open Space.

Chair Hedrick called the public hearing to order at 8:26 p.m.

Shown as present were Commissioners Mark Hedrick, Robert Barnhart, Vicky Torres, Julie Steadman, and Joelle Morken. Shown as absent were Brad Lawson and Alex Haughee. Quorum was present. Also present was Brandy Williams, Zoning Administrator.

Clerk Aldis read the public hearing notice into the record. The notice was published in the *Daily Chronicle* June 22, 2024, meeting the requirements of the law. No correspondence was received regarding this hearing.

Swear in those wishing to testify

Ms. Williams remains sworn from previous hearing.

Applicant Testimony

The Town is the applicant.

Public Testimony

There was no public testimony.

Staff Report

Ms. Williams reviewed her advisory report with the commission. She stated that town had, 18 months ago, completed an application to purchase the lots from the county. The lots under petition adjoin Dragon Tail Pond. These lots are intended to expand that recreational area. The remainder of the lots in the subdivision are under contract so now is the appropriate time to request rezoning. No utilities are required for these lots. She stated this purpose, and request is in line with current zoning to the south (pond) and no infrastructure is needed.

Deliberations

There were no deliberations.

Chair Hedrick closed the public hearing at 8:38 p.m.

Findings of Fact

a. Existing use(s) and zoning of the property in question.

The Subject Property is unimproved, zoned R-3 Two-Family Residence with a Special Use Permit (SUP) for the Planned Unit Development (PUD) overlay.

The Planning Commission agrees.

b. Existing use(s) and zoning of other lots in the vicinity of the property in question.

The lands to the west and north, across East Ashford Avenue, are unimproved, zoned R-3 Two-Family Residence with Special Use Permit.

The Planning Commission agrees.

The land to the south of the subject property is zoned P-1 Recreation & Open Space and used as a recreational area with open water.

The Planning Commission states that the land to the south and east of the subject property is zoned P-1 Recreation & Open Space and used as a recreational area with open water.

c. Suitability of the property in question for uses already permitted under existing regulations.

Developing the property for residential purposes is appropriate.

The Planning Commission agrees.

d. Suitability of the property in question for the proposed use.

The applicant intends to use the property as an expansion of the immediately adjacent recreation and open space area of Dragon Tail pond. The property is suitable for the proposed use. The existing road and driveway will provide any required infrastructure needs.

The Planning Commission agrees.

e. The trend of development in the vicinity of the property in question, including changes (if any) which may have occurred since the property was initially zoned or last rezoned.

The Subject Property has been zoned R-3 Two-Family Residence with SUP since 2007. There have been no recent changes in zoning or use adjacent to the subject property.

The Planning Commission states that the subject property has been zoned R-3 Two-Family Residence with a SUP since 2007. There have been no recent changes in zoning. The use of the adjacent property changed from strictly storm water basin to the added use of recreational area, Dragon Tail Pond.

f. The effect the proposed amendment would have on implementation of this Municipality's Comprehensive Plan.

Approval of the rezoning request would be in concurrence with the Future Land Use Map included in the Comprehensive Plan. Granting the request would permit an expanded footprint of an immediately adjacent municipal use.

The Planning Commission agrees.

Mr. Barnhart moved to approve the Findings of Fact as amended, seconded by Ms. Steadman. Unanimous voice vote carried the motion.

Recommendation

Ms. Steadman moved to approve a recommendation to rezone the 14 parcels of Town of Cortland property currently know as PINs 09-33-181-001 through 09-33-181-014 in the Town of Cortland from its present classification of R-3 with Special Use Permit to P-1 Recreational & Open Space. Mr. Barnhart seconded the motion.

Yeas: Commissioners Robert Barnhart, Vicky Torres, Joelle Morken, Mark Hedrick, and Julie Steadman

Nays: None

Absent: Commissioners Brad Lawson and Alex Haughee

Roll call vote of 5-yea, 0-nay, 2 absent. The motion carried.

The recommendation of a request for rezoning shall be forwarded to the Town Board for consideration at its July 22, 2024, meeting.

REPORT OF THE CHAIR

No report made.

COMMISSSIONER'S REPORT

No report made. The meeting of September 5 is cancelled as there is no business. The next meeting is October 3, 2024.

STAFF REPORTS

There were no staff reports.

ADJOURNMENT

Mr. Barnhart moved to adjourn, seconded by Ms. Steadman. Voice vote carried the motion. Meeting adjourned at 9:00 p.m.

Respectfully submitted,

Cheryl Aldis

Town Clerk

ADVISORY REPORT

TO: Planning Commission

FROM: Brandy Williams, Engineer and Zoning Administrator

DATE: November 25, 2025

SUBJECT: PC 25-02: Request a Special Use Permit on the subject property to, upon annexation, construct operate, and maintain a Solar Garden on PINS 09-27-100-002 and 09-27-300-004 located at Illinois Route 38
Public Hearing scheduled for December 4, 2025, 7:00 PM

APPLICANT: SolarStone Partners
125 SE Main St
Minneapolis, MN 55414

OWNERS: James R. Walter and James E. Walter
16513 Lynch Rd
DeKalb, IL 60115

PROPOSAL

SolarStone Partners, as applicant, has filed with the Town of Cortland a request for a Special Use Permit (SUP) in accordance with Title 9, Chapter 10, Section 6B of the Cortland Town Code regarding the property located at Illinois Route 38, DeKalb County, Illinois. The 80.33-acre site is located north of Illinois Route 38 and south of the Union Pacific Railroad comprised of PIN 09-27-100-002 and PIN 09-27-300-004. The applicant is requesting a Special Use Permit on the subject property to, upon annexation, construct, operate, and maintain a Solar Garden as set forth in Title 9, Chapter 4, Section 34 of the Cortland Town Code. The petitioner's application is attached as Exhibit A.

The property is currently not annexed to the Town of Cortland. A joint petition for a Special Use Permit and Annexation was submitted. When a property is annexed to the Town of Cortland, the default zoning is AG, Agricultural. Because AG, Agricultural is the applicant's desired zoning, rezoning is not requested or required. The Town Board evaluates the annexation request.

LOCATION AND DESCRIPTION

The subject property is located east of town proper, on the north side of Illinois Route 38, south of the Union Pacific railroad, west of Airport Road. The subject property is comprised of two parcels PIN 09-27-100-002 and PIN 09-27-300-004 for a total of 80.33 acres.

The applicant intends to, upon annexation, construct, operate, and maintain a Solar Garden. Solar Gardens may be operated under a Special Use Permit in AG Agriculture of I-1 Light Industrial zoning districts. Title 9, Chapter 2 Definitions includes
SOLAR GARDEN: A commercial solar-electric (photovoltaic) array that provides retail electric power (or a financial proxy for retail power) to multiple households or businesses residing or located off-site from the location of the solar energy system.

Existing and Surrounding Zoning: The subject parcels are zoned DeKalb County A-1. Properties to the west, east and south are zoned DeKalb County A-1. The property to the north across the Union Pacific Railroad Right of Way is annexed to the Town of Cortland and zoned P-1 Recreation & Open Space.

The zoning map has been included as Exhibit B.
The 2024 Official Zoning Map can be found on the Town of Cortland website and at:
chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.cortlandil.org/uploads/dm/24901/Zoning_Map_2024_Published_in_2025.pdf

Existing and Surrounding Land Uses: The subject parcels are listed by DeKalb County as farmland and used as row crop. Properties to the west, east and south across Route 38 are listed by DeKalb County as farmland and used as row crop. Immediately south, adjacent to the subject parcel is a homestead. The property to the north across the Union Pacific Railroad Right of Way is annexed to the Town of Cortland and zoned P-1 Recreation & Open Space.

BACKGROUND

The subject property has been used as farmland for decades. The subject property is not served by water, sanitary sewer or storm sewer. Roadway access is currently by a farm entrance from Illinois Route 38.

COMPREHENSIVE PLAN

The Town adopted a Comprehensive Plan in September 2023, which guides development throughout the community. The Future Land Use Map within the Comprehensive Plan depicts the subject property as Agricultural use.

The default zoning does coincide with the Comprehensive Plan. There is no distinction in the Future Land Use Map for Special Use Permits or for Solar Energy Systems, specifically.

Note: An excerpt of the Comprehensive Plan is attached as Exhibit C. The full Comprehensive Plan can be found on the Town of Cortland's website and at:

https://www.cortlandil.org/vertical/sites/%7B869DC155-25BA-43FB-B05D-BD63FEA0657C%7D/uploads/Cortland_2023_Comprehensive_Plan_v05_Final.pdf

TECHNICAL REVIEW

Water, sanitary sewer, and storm sewer utilities are not required for the project. Any electric infrastructure will be completed by the developer or ComEd as part of the interconnection agreements. Once the facility is operational and the construction traffic ceases, vehicular access will be nominal. However, because the roadway providing the site access is a state route, IDOT will need to review and approve the entrance design. A building permit will not be issued until confirmation of IDOT approval of the entrance is provided to the Town. Variances from Town Code have not been requested as part of the application. Financial obligations and surety will be in accordance with Town Code which differs from language included in the application under "Financial Framework".

STANDARDS UPON WHICH REVIEW SHOULD BE TAKEN

In accordance with 9-10-6. – Procedures, C. Report of Hearing; Within thirty (30) days following the hearing, the plan commission shall transmit to the town board a written report giving its findings as to compliance of the proposed special use with the standards governing special uses and giving its recommendation for action to be taken by the town board. A copy of the standards to be used is included in Exhibit D. The Findings of Fact report shall consider all information presented.

PLANNING COMMISSION ACTIONS

Open the Public Hearing and accept any and all testimony related to the proposal. Once all testimony has been presented the Commission may close the hearing. After closing the hearing, the Commission may discuss the merits of the presented information, establish the Findings of Fact upon which decisions may be made and render a recommendation to the Town Board.

The Planning Commission may recommend to either approve, deny or provide approval with conditions.
It is important to note that any motion must be made as a positive statement. (I.E., "I make a motion to approve the request for Special Use Permit on the subject property comprised of PINs 09-27-100-002 and 09-27-300-004.")

Respectfully Submitted,

Brandy Williams
Engineer and Zoning Administrator

Exhibit A – Application for SUP and Annexation
Exhibit B – Town of Cortland 2024 Official Zoning Map
Exhibit C – Town of Cortland Comprehensive Map (Excerpt)
Exhibit D – Standards and Conditions for Special Use Permit Compliance

Date Filed:	
Job Number:	
PC Number:	

LAND DEVELOPMENT APPLICATION

THE UNDERSIGNED RESPECTFULLY PETITIONS THE TOWN OF CORTLAND TO REVIEW AND CONSIDER GRANTING THE FOLLOWING APPROVAL ON THE LAND HEREIN DESCRIBED.
(Check all that apply)

- [x] Annexation*
- [ ] Rezoning from _____ to _____
- [ ] Text Amendment (attached proposed language)
- [x] Special Use Permit for a:
- [ ] Planned Unit Development
- [x] Other Two solar gardens for a total of 7 MWac
- [ ] Planned Unit Development:
  - [ ] Concept Plan
  - [ ] Preliminary Development Plan
  - [ ] Final Development Plan
- [ ] Subdivision Plat:
  - [ ] Preliminary Subdivision Plat
  - [ ] Final Subdivision Plat

**** Attach an original copy of the annexation petition to this application***

PLEASE PRINT OR TYPE IN BLUE OR BLACK INK

PART I. APPLICANT INFORMATION

	APPLICANT	LAND OWNER *(If not the Applicant)*	CONTACT PERSON *(If not the Applicant)*
Name:	Conner Sayles	James R Walter and James E. Walter	
Company	Cortland Illinois Dynamics 1 LLC	N/A	
Address:	1083 N. Collier Blvd, #408	16513 Lynch Rd	
	Marco Island, FL 34145	DeKalb, IL 60115	
E-mail:	conner.sayles@solarstonepartners.com	jamie@whiskeyacres.com	
Phone:	425-293-1111	815-739-8711	

IS THE APPLICANT THE OWNER OF THE SUBJECT PROPERTY? ☐ YES ☑ NO

*(If the Applicant is not the owner of the subject property, a notarized letter from the Owner authorizing the Applicant to file the **Land Development Application** must be attached to this application.)*

IS THE APPLICANT AND/OR OWNER A TRUSTEE OR A BENEFICIARY OF A LAND TRUST? ☐ YES ☑ NO

(If the Applicant and/or Owner of the subject property is a Trustee of a land trust or beneficiary(ies) of a land trust, a disclosure statement identifying each beneficiary of such land trust by name and address and defining his/her interest therein shall be verified by the Trustee and shall be attached hereto.)

Cortland Land Development Application

Date Filed:

PC Number:

PART II. PROPERTY INFORMATION

ADDRESS OF PROPERTY: XXX IL-38, DeKalb, IL 60115 41.913126, -88.657188

PARCEL INDEX NUMBER(S): 0927100002 & 0927300004

LEGAL DESCRIPTION: *A FULL LEGAL DESCRIPTION MUST BE ATTACHED TO THIS APPLICATION*

TOTAL AREA OF SUBJECT PROPERTY(IES) (*ACRES*): 80.33

IF SUBDIVIDING, NUMBER OF LOTS BEING CREATED:

CURRENT ZONING: AG **PROPOSED ZONING:** AG

RECOMMENDED LAND USE: Agricultural

(Based upon the recommendations of the Cortland Town Plan)

PROPOSED LAND USE: Solar Garden

NAME OF PROPOSED DEVELOPMENT: Cortland Illinois Dynamics 1 LLC and Cortland Illinois Dynamics 2 LLC

The subject property is located in which FIRE PROTECTION DISTRICT? Maple Park Fire Protection District

The subject property is located in which SCHOOL DISTRICT? CUSD #403 - Kaneland

Attach relevant checklist(s) and associated information as outlined during the pre-application meeting. ☐

I, Conner Sayles, hereby apply for review and approval of this application and represent that the application and requirements thereof and supporting information have been completed in accordance with the Zoning Ordinance and/or Subdivision Ordinance of the Town of Cortland.

Conner Sayles
Signature of Applicant

10/14/2025
Date

State ~~of Illinois~~ Florida
County of Collier.

Signed before me on October 14th, 20 25 by Conner Sayles
Applicant

(Seal)

Jill Sesso
Signature of Notary Public

JILL SESSO
Notary Public, State Of Florida
Commission No. HH 290895
My Commission Expires: 7/21/2026

Request #1 – Annexation Petition

Item A: Owner Authorization Letter

Notice of Authorization

I, James E. Walter and James R. Walter of DeKalb, IL owner(s) of certain real farmland property located in Cortland Township, specified by PIN# 0927100002 & PIN# 0927300004, containing approximately 81 acres, MOL, hereby authorize SolarStone Partners, its agents and assigns, to apply for its annexation into the Town of Cortland by completing a Land Development Application on his behalf. I also give authorization to the same to apply for a Special Use for a community solar project with the Town of Cortland, and/or County of DeKalb. JEW JRW

Dated: 5/24/24

James E. Walter James R. Walter

Owner(s)

State Of Illinois County Of DeKalb

I, the undersigned, a Notary Public in and for the said County and State aforesaid, do hereby certify that James E. Walter + James R. Walter personally known to me to be the same person(s) whose name(s) is/are subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he/she/they signed, sealed and delivered this instrument as his/her/their free and voluntary act for the uses and purposes therein set forth.

GIVEN under my hand and NOTARIAL SEAL this day of 5/24, 2024.

Notary Public

Nicole Faber

OFFICIAL SEAL
NICOLE FABER
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES October 03, 2026

Item B: Annexation Petition

STATE OF ILLINOIS
COUNTY OF DEKALB
TOWN OF CORTLAND

PETITION FOR ANNEXATION

TO THE CORPORATE AUTHORITIES OF THE,

TOWN OF CORTLAND, ILLINOIS

WHEREAS, the undersigned Petitioner, hereby respectfully petitions to annex to the Town of Cortland, DeKalb County, Illinois, the territory described on Exhibit "A" attached hereto and made part of hereof ("Territory") and states as follows:

1. The Territory hereinbefore is not within the corporate limits of any municipality;
2. The Territory hereinbefore described is contiguous to the Town of Cortland, DeKalb County, Illinois;
3. The Territory hereinbefore described is located within Cortland Township;
4. There are no electors residing on the Territory hereinbefore described;
5. The Petitioner has been authorized by the sole owner of record of the described territory to petition that said territory be annexed to the Town of Cortland, via an authorization letter attached in "Item A"; and

WHEREFORE, the Petitioner respectfully requests the corporate authorities of the Town of Cortland, DeKalb County, Illinois, to annex the Territory hereinbefore described to said Town in accordance with the provisions of this Petition.

Dated this 25th day of June, 2024.

Conner Sayles

Petitioner: SolarStone Partners

By: Conner Sayles

Title: Development Associate

STATE OF FLORIDA
COUNTY OF COLLIER

I, Jill Sesso, a Notary Public in and for said County in the State aforesaid do hereby certify that Conner Sayles, Development Associate appeared before me this day in person and acknowledged that he caused the within Petition to be duly executed by him as his free and voluntary act and for the uses and purposes therein set forth.

GIVEN under my hand and Notarial Seal this 25th day of June, 2024.

Jill Sesso

JILL SESSO
Notary Public, State Of Florida
Commission No. HH 290895
My Commission Expires: 7/21/2026

Exhibit A: Annexation Plat & Legal Description

MAP OF TERRITORY TO BE ANNEXED TO THE TOWN OF CORTLAND, DEKALB COUNTY, ILLINOIS

PARENT PARCEL DESCRIPTION

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General Notes

1. The horizontal datum and basis of bearing for this project is State Plane Illinois East Zone (GRID) NAD 83 (NA 2011).

2. This survey does not constitute a title search by the Surveyor.

3. The acreage and square footage of the parcels of the Property indicated represents a mathematical closure of the perimeter courses and distances as shown hereon.

4. There are no other survey matters of record, easements or Rights-of-way of which the undersigned has been advised, or other matters evidenced on the ground, other than scheduled title exceptions or except as otherwise shown hereon.

5. No portion of Property lies within the city limits of an incorporated city;

6. Ingress to and egress from the subject property is provided from the public roads shown on the survey; and all roads shown on the survey (unless otherwise noted) are public roads and are maintained by the state or county in which they are located.

7. All shown bearings and distances are shown as measured and are GRID

8. Survey is based on field work completed on February 23, 2024.

9. No title commitment or deed was provided or reviewed as part of this survey. The legal description is based on deeds from the counties record keeping web site.

10. This professional service conforms to the current Illinois Minimum Standards for a boundary survey

11. The area of the Property is 3499201.23 square feet (80.33 acres) as surveyed.

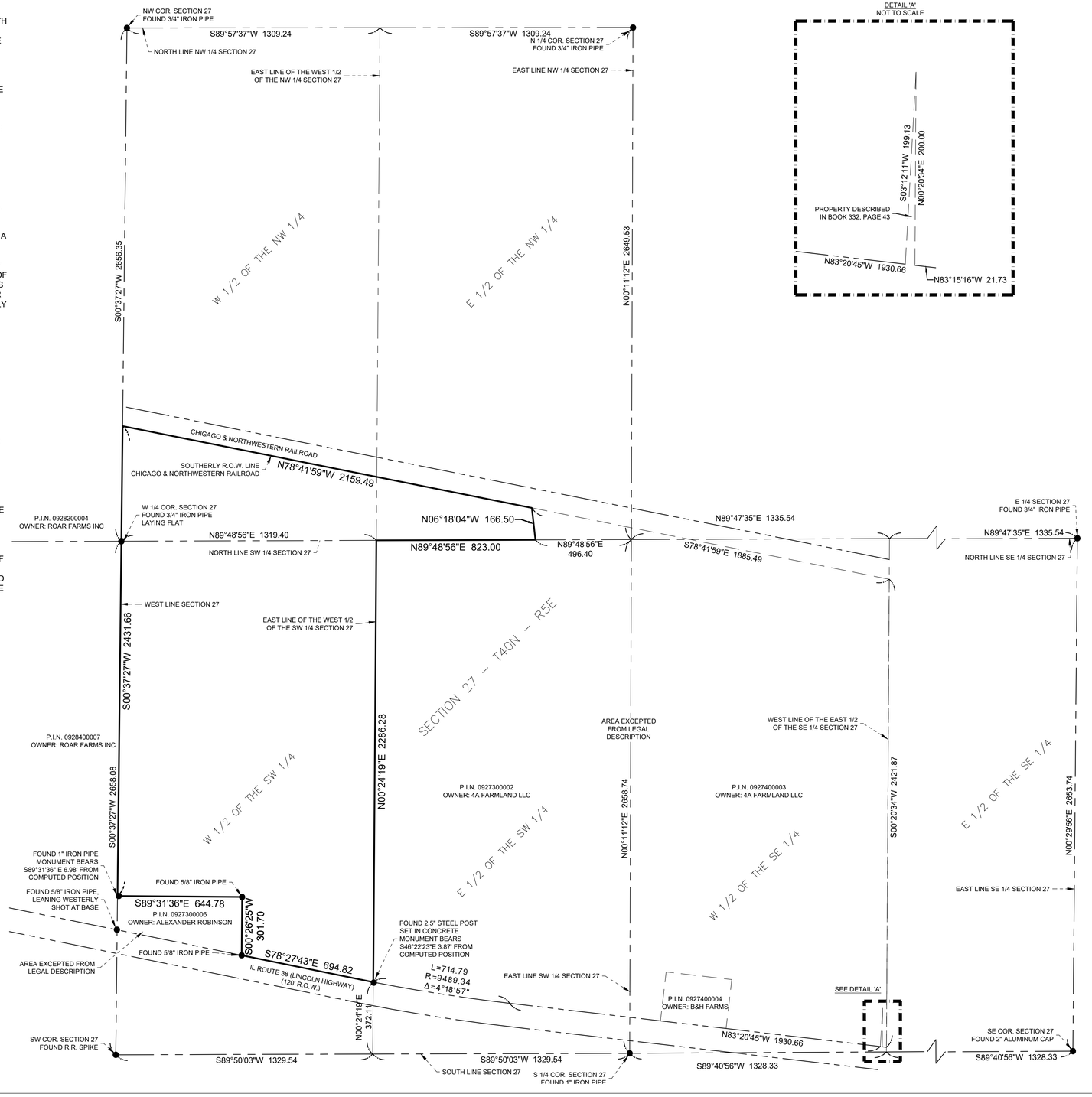
Certification

I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly licensed professional land surveyor under the laws of the State of Illinois.

Dallas Westerlund, Land Surveyor, IL License No. 035004041 — June 4, 2024 Date

Dallas Westerlund, Land Surveyor, IL License No. 035004041
dwesterlund@wsbeng.com
701 Xenia Ave S, Suite 300
Minneapolis, MN 55416
612-269-3325

PROFESSIONAL LAND SURVEYOR — DALLAS WESTERLUND — 035.004041 — BROOKLYN CENTER, MINNESOTA — STATE OF ILLINOIS



wsb

Crew: CL
Checked: DCW
Drawn: MLP
Record Drawing by/date:
Project No.: 024543-000

Revisions:

Prepared for:

SOLARSTONE

N

0 100 200

LEGEND

- FOUND MONUMENT
- CALCULATED CORNER
- SECTION LINE
- QUARTER SECTION LINE
- 16TH SECTION LINE
- PARCEL BOUNDARY
- RIGHT OF WAY LINE

Cortland Solar

DEKALB COUNTY, IL

Annexation Plat

Sheet: 1

Legal Description

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Item C: Natural Resources Information Report

Natural Resource Information Report

Compiled By

The DeKalb County Soil and Water Conservation District



DeKalb County Soil and Water Conservation District
1350 West Prairie Drive, Sycamore IL, 60178
Phone: (815) 756-3234 x3
dekalbswcd@gmail.com

Project Information

Natural Resource Information File Number	#736
Date the SWCD Board Reviews Report	May 8th, 2024
Name of Petitioner	Cortland Illinois Solar, LLC
Size of Area of Review	81.1 acres
Current Zoning	A1 (Agricultural) – DeKalb County
Proposed Zoning	AG, Special Use – Town of Cortland
Parcel Numbers	09-27-100-002, 09-27-300-004
Contact Person	Conner Sayles

Copies of this report and notification of the proposed land use changes were provided to:	Yes	No
The Petitioner	X	
The Petitioners Legal Representation		X
Town of Cortland	X	
DeKalb County SWCD District Files	X	

***Report Prepared By**: Jeff Woodyatt* ***Position**: Resource Conservationist*

Purpose and Intent of This Report

The purpose of this report is to provide officials of the local governing body and other decision-makers with natural resource information. This information may be useful when undertaking land use decisions concerning variations, amendments or relief of local zoning ordinances, proposed subdivision of vacant or agricultural lands and the subsequent development of these lands. This report is a requirement under Section 22.02a of the Illinois Soil and Water Conservation Districts Act.

The intent of this report is to present the most current natural resource information available in a readily understandable manner. It contains a description of the present site conditions, the present resources, and the potential impacts that the proposed change may have on the site and its resources. The natural resource information was gathered from standardized data, on-site investigations and information furnished by the petitioner. This report must be read in its entirety so that the relationship between the natural resource factors and the proposed land use change can be fully understood.

Due to the limitations of scale encountered with the various resource maps, the property boundaries depicted in the various exhibits in this report provide a generalized representation of the property location and may not precisely reflect the legal description of the PIQ (Parcel in Question).

This report, when used properly, will provide the basis for proper land use change decisions and development while protecting the natural resource base of the county. It should not be used in place of detailed environmental and/or engineering studies that are warranted under most circumstances, but in conjunction with those studies.

The conclusions of this report in no way indicate that a certain land use is not possible, but it should alert the reader to possible problems that may occur if the capabilities of the land are ignored. Any questions on the technical data supplied in this report or if anyone feels that they would like to see more additional specific information to make the report more effective, please contact:

DeKalb County Soil and Water Conservation District
1350 West Prairie Drive, Sycamore, IL 60178
Phone: 815-756-3234 ext. 3
E-mail: DeKalbswcd@gmail.com

Table of Contents

Executive Summary.....5

DeKalb County SWCD Land Use Opinion 10

Parcel Location and Photos 12

Soils Information.....15

Archaeologic/Cultural Resources 17

Ecologically Sensitive Areas 19

Geologic/Aquifer Information.....21

Watershed Information.....24

Topographic/FEMA Information.....26

Soil Erosion and Sediment Control 29

Wetland Information 30

Land Evaluation and Site Assessment (LESA) 34

DeKalb County Unified Future Land Use Plan Map 36

Town of Cortland Future Land Use Plan Map 38

Glossary 40

References 43

Supplement Material

Supplemental A. - Custom Soils Resource Report

Supplemental B. - NRCS Conservation Practice Standard 560 (Access Road)

Executive Summary

Natural Resource Information File Number:	#736
Petitioners Name:	Cortland Illinois Solar, LLC
Contact Person:	Conner Sayles
Unit of Government Responsible for Land Use Change:	Town of Cortland
Location of parcel:	*Part of the Southwest Quarter in Section 27 of Township 40 North, Range 5, East of the third principal meridian (Cortland Township).*
Property Address, PIN Number	09-27-100-002, 09-27-300-004
Existing Land Use:	A1 (Agricultural) – DeKalb County
Surrounding Land Use:	A1, Ag. Row Crops
Proposed Land Use:	Commercial Solar Energy System
Proposed Water Supply:	N/A
Proposed Wastewater Treatment:	N/A
2007 Cortland Future Land Use Plan	Open Space, Mixed Residential, and Commercial

Highlights of the Natural Resource Concerns

Land Evaluation and Site Assessment (LESA): Land Evaluation score is **91.7** out of 100. The Site Assessment for the proposed project was not calculated for this report; the assessment factors used for the Site Assessment are grouped into five major areas of consideration:

1. Agricultural/Land Use
2. Zoning
3. Compatibility and Impact of Uses
4. Land Use Feasibility
5. Compatibility with Comprehensive Development Plans

The proposed project is to be located within an A-1 zoned district with Special Use condition. This project will have little impact to the factors listed above, therefore the Site Assessment would not be feasible in this situation as there would be little deviation from the current zoning for this site.

Prime Farmland: Prime farmland soils are an important resource for DeKalb County. Each soil type is assigned a rating, which is then used to determine the Land Evaluation (LE) score for the site. Sites with a LE score of 80 or greater are considered to be prime farmland. This site has a score of **91.7** on the LE soil evaluation system, which places it within the definition of Prime Farmland. A complete description of the farmland classification for this site can be found in the **Custom Soils Resource Report** (**Supplemental A)** starting on **page 39**.

Stormwater: The District encourages the use of on-site detention for stormwater runoff if required by the municipality or County. The DeKalb County Stormwater Ordinance should be used to determine detention requirements. There should be no changes made to the natural surface flow of water on the site. All roadways associated with the project should follow the natural contours of the land. Culverts should be used to a minimum or not at all. The Natural Resource Conservation Service (NRCS) Conservation **Practice Standard for Access Roads** (**Supplemental B)** is included with this report as a resource document.

NPDES Permits: An NPDES (National Pollution Discharge Elimination System) permit from the Illinois EPA is required for all construction and demolition sites that disturb 1 acre or more.

Sediment and Erosion Control: Development on this site should include a sedimentation and erosion control plan which is required by the ILR10 permit (SWPPP) with the Illinois EPA. The DeKalb County Soil and Water Conservation District recommends the use of the Illinois Urban Manual in selecting proper Best Management Practices (BMPs). Based on the topography and soils found on this site the District recommends establishing ground cover prior to construction to prevent excessive erosion.

Hydrologic Soils: Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The specific soil types and hydrologic soil groups associated with this site are:

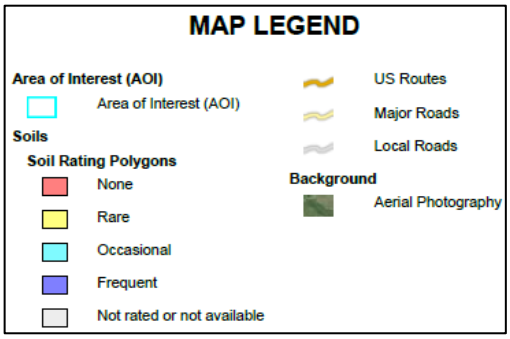
Table—Hydrologic Soil Group (NRI 736)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	B/D	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	B/D	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	C/D	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	C	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	B	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	C	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	C	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	C	11.2	13.8%
Totals for Area of Interest			**80.9**	**100.0%**

A complete description of the hydrologic soil groups that have been identified for this site are located in the **Custom Soils Resource Report** starting on **page 53**.

Ponding Frequency: Drummer silty clay loam (152A) make up 26.3% or 21.3 acres of the reviewed area, are classified as very poorly drained soils. Their ponding classification is “Frequent.” Meaning that ponding occurs, on average, more than once in 2 years. The chance of ponding is more than 50 percent in any year. Please refer to **page 64** of the **Custom Soil Resource Report** for additional information.





NWI Wetlands: A review of U.S. Fish & Wildlife Service National Wetland Inventory (NWI) maps identified **no potential wetland areas** on this site. Please refer to **page 31** of the **Natural Resource Information Report.**

USDA-NRCS Wetland Inventory: A review of NRCS (Natural Resources Conservation Service) Wetlands Inventory maps identified **no potential wetland area within the project area.** Refer to the USDA-NRCS Wetland map on **page 32** of the **Natural Resource Information Report.**

Floodplain: A review of FEMA's National Flood Hazard Layer identifies a small area in the northeast corner of the parcel in question within a flood hazard area (Zone A). Based on the proposed site plans this area is outside of current development plans, thus no impacts to floodplains are expected. Please refer to **pages 26** of the **Natural Resource Information Report.**

Aquifer Sensitivity: Based on Illinois State Water Survey maps this area has **aquifer material identified within 50 feet of the surface and the potential for aquifer contamination is present (page 21).** The District recommends the use of Best Management Practices to prevent the release of any pollutants on the site during or after construction. Proper clean up and containment procedures should be developed and implemented for this site.

Ecological Considerations: The District recognizes two potential sources of water pollution from solar farms. Each of these concerns have best management practices that can be used to mitigate risks. The potential pollution sources and best management practices include:

Cracked panels - Leaching of toxic materials could be an issue if a large number of broken panels were exposed to precipitation over a long period of time. To prevent leaching from becoming an issue, solar farm operators should regularly inspect for cracked panels. Any cracked panels must be immediately stored under protective cover to prevent exposure to precipitation. No broken panels, or any parts of broken panels, shall remain exposed to the elements while stored on-site. To reduce risks over time and prevent an excessive number of panels from being stored onsite, cracked panels should be periodically transported offsite for recycling or proper offsite storage.

Oil leaks or spills from transformers - Electrical transformers are used to step up output voltage from the solar farms to the electrical grid. Electrical transformers contain oil, even those used in renewable energy systems. Oil leaks or spills resulting in environmental damage can occur. The size and voltage of the solar farm affects the size of the electrical transformers and the volume of oil being used. To mitigate risks of oil pollution from transformers, the following best management practices are recommended.

- Use only biodegradable oil in the transformers. Larger transformers typically use mineral based oil unless biodegradable oil is specifically requested. While leaks and spills of biodegradable oil must still be prevented, risks for groundwater contamination would be reduced and clean-up efforts simplified in the event of a release.
- Provide secondary containment systems such as trays, membranes, or vaults to collect and contain all oil in the event of a leak or spill. The containment systems must be designed to manage stormwater so adequate containment volume is maintained. If the containment area were to fill up with stormwater, there would not be sufficient storage volume to capture and contain the oil. A variety of secondary containment options are available. Solar farm developers would be responsible for selecting the secondary containment system and demonstrating its effectiveness.

Solar Farm Ground Cover: The District would like to remind the developer of the requirement of installing and maintaining a **native perennial vegetative ground cover, per the Town of Cortland's SES Town Code (Section 9-4-34 part B-8).** It is highly recommended that the developer establishes a detailed Landscape Monitoring and Maintenance Plan. If requested, the District will review these plans and make recommendations where applicable. It is important for the long-term success of the ground cover that these plans are developed by an experienced individual that takes into consideration the qualitative characteristics of the project site, mainly soil and hydrologic factors that affect plant growth and establishment across the site.

Benefits of native shrubs and groundcovers, such as grasses and wildflowers, include improved erosion control, pesticide avoidance, stormwater infiltration, wildlife habitat, and reduced overall maintenance. In addition, native fruiting and flowering plants provide a food source and habitat for wild native bees. Native bees make a considerable contribution to agricultural crops through pollination.

Promoting habitat for native bees and other pollinators can have a positive ecological impact on disturbed sites, as well as a positive economic impact on neighboring insect-pollinated crops. Planting native grasses and wildflowers in low maintenance areas of solar farms also reduces long-term maintenance costs and emissions. These naturalized meadows, once established, are more drought tolerant, require little to no fertilization, and only need to be mowed once or twice a year.

Sustainable landscaping strategies serve as an educational tool to the community about positive agricultural and environmental practices, and act as a visual demonstration of commitment to land stewardship.

DeKalb County SWCD
Land Use Opinion

The DeKalb County Soil and Water Conservation District (here after SWCD or District) has reviewed the natural resource information for a Solar Energy System site proposed by Cortland Illinois Solar, LLC. This site is located in part of the Southwest Quarter in Section 27 of Township 40 North, Range 5, East of the third principal meridian (Cortland Township). The area of review includes two parcels (09-27-100-002 and 09-27-300-004) totaling 81.1 acres. The parcels are currently zoned A-1 (DeKalb County) with the intent to have the parcels be rezoned under an annexation agreement with the Town of Cortland to AG with a Special Use for a Solar Farm.

Based on the DeKalb County Soil Survey, this site is principally comprised of Prime Farmland soils. These types of soils are recognized for their highly productive qualities for growing agriculturally important grain and fiber crops. Preserving soil resources, especially those that are designated Prime Farmland, is an important consideration as we look forward towards the food and fiber needs in our communities. The SWCD Board of Directors is irresolute in their consideration of changing land use that has such a significant impact on agriculture production. The Land Evaluation score for the area of review was 91.7. A site that scores 80 or greater is considered prime farmland.

The DeKalb County SWCD also acknowledges that land taken out of agriculture production and used for the purpose of a solar farm can have beneficial effects on soil health and surface water quality leaving the site. The District would like to remind the developer of the requirement of installing and maintaining a native perennial vegetative ground cover, per the Town of Cortland's SES Town Code (Section 9-4-34 part B-8.

The DeKalb County SWCD strongly recommends the use of diverse native ground cover, specifically plant varieties beneficial to pollinator species, be used to vegetate the site. Recent field studies have indicated the benefits of native plant use in solar arrays not only to soil health and habitat creation, but also the resiliency of such ground cover to drought and prolonged wet conditions, and reduced maintenance needs after successful establishment. Native vegetation will help improve surface water quality within the project site along with the adjacent stream (Union Ditch Number 2). It will be the responsibility of the Developer to protect the natural resources on and surrounding this site from potential contaminants.

The DeKalb County SWCD recommends that a sub-surface drainage tile investigation is completed prior to the disturbance of the site. Several areas on the site contain areas that either possess soils that are poorly or very poorly drained and have a high likelihood of frequent ponding. The current proposed site plan does primarily avoid these areas, however if plans are altered the district recommends that the areas with high ponding frequencies and surface water flow be carefully considered due to water maintenance, development, and erosion issues.

Moreover, studies regarding Solar Farms have been completed to evaluate hydrologic effects and examine whether water management is needed to control runoff. These studies show that it is important to have vegetative cover during construction and after to protect the soil from erosion. In some cases, it may be necessary to have detention; an Engineer will determine any specific detention requirements that may be applicable for this site. The District would like to recommend that the site be

established with a temporary cover prior to construction if possible, in order to stabilize the site and minimize soil erosion. It has been observed on similar developments that a lack of temporary cover results in significant challenges managing field conditions during the construction phase of the project.

If development occurs, a soil erosion and sediment control plan will need to be in place. If the area has land disturbance of one acre or more the developer will need to comply with the IEPA ILR-10 permit which includes a Storm Water Pollution Prevention Plan. Sediment leaving the area can damage streams, ponds, and wetlands. Best Management Practices will need to be in place to protect the site and surrounding areas from erosion and sedimentation.

As a SWCD, we have established that it is our mission to "responsibly protect our healthy soils and clean water for all generations." The proposed project will provide vegetative cover of the soil for the length of its project life. Established vegetation will provide protection from erosion and improve soil health. This report contains information regarding potential issues with recommendations to address them accordingly.

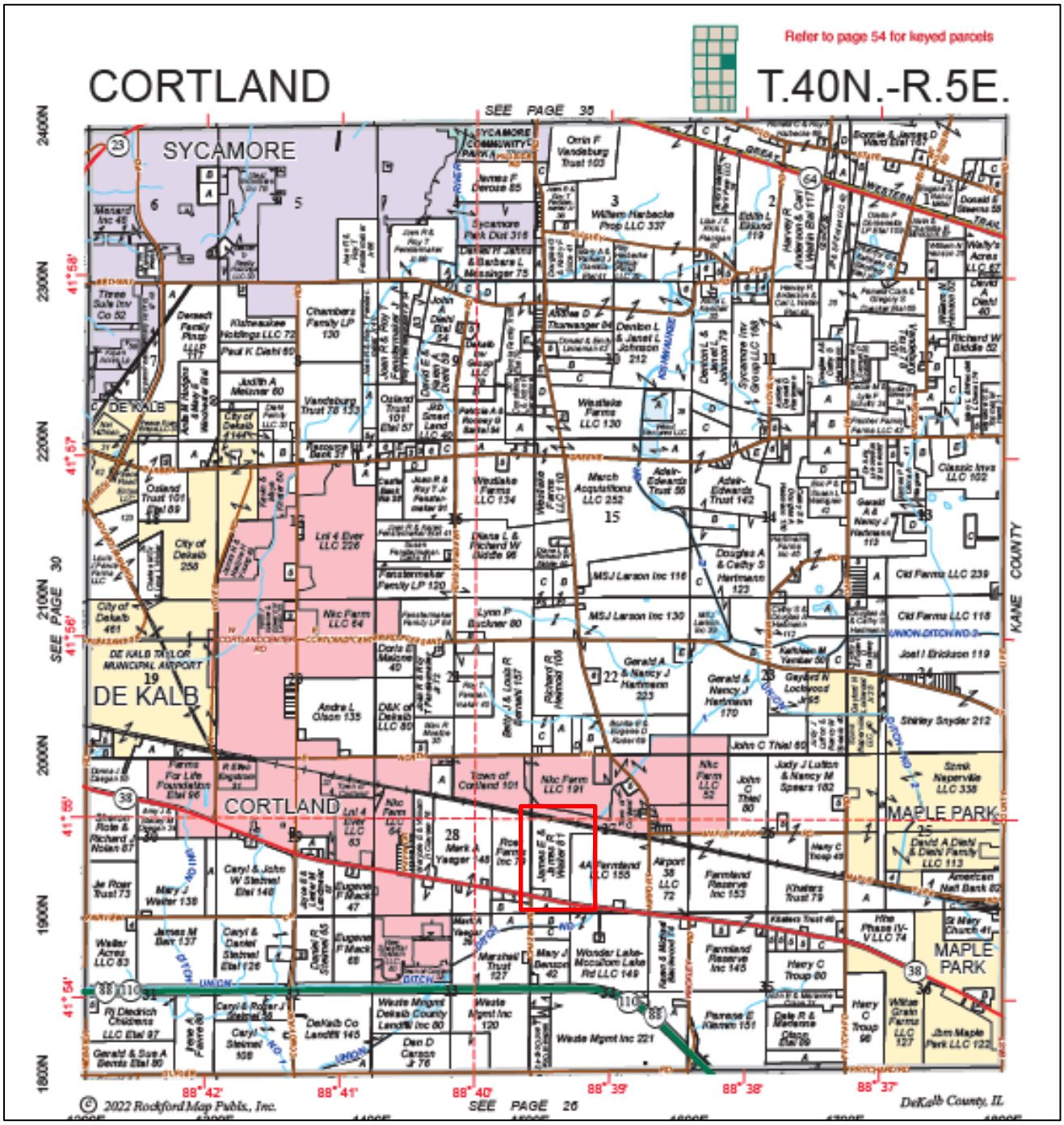
The DeKalb County Soil and Water Conservation District hereby approves the Petitioners request provided that the aforementioned items stated above are addressed, as well as the information gathered here is considered during the planning stages of any future development of this site.

The information that is included in this Natural Resource Information Report is to ensure the Land Developers take into full consideration the limitations of that land that they wish to develop. Guidelines and recommendations are also a part of this report and should be considered in the planning process. The Natural Resource Information Report is required by the Illinois Soil and Water Conservation District Act (Ill Complied Statues, Ch. 70 Par 405/22.02a).

Paul Kuhn
SWCD Chairman

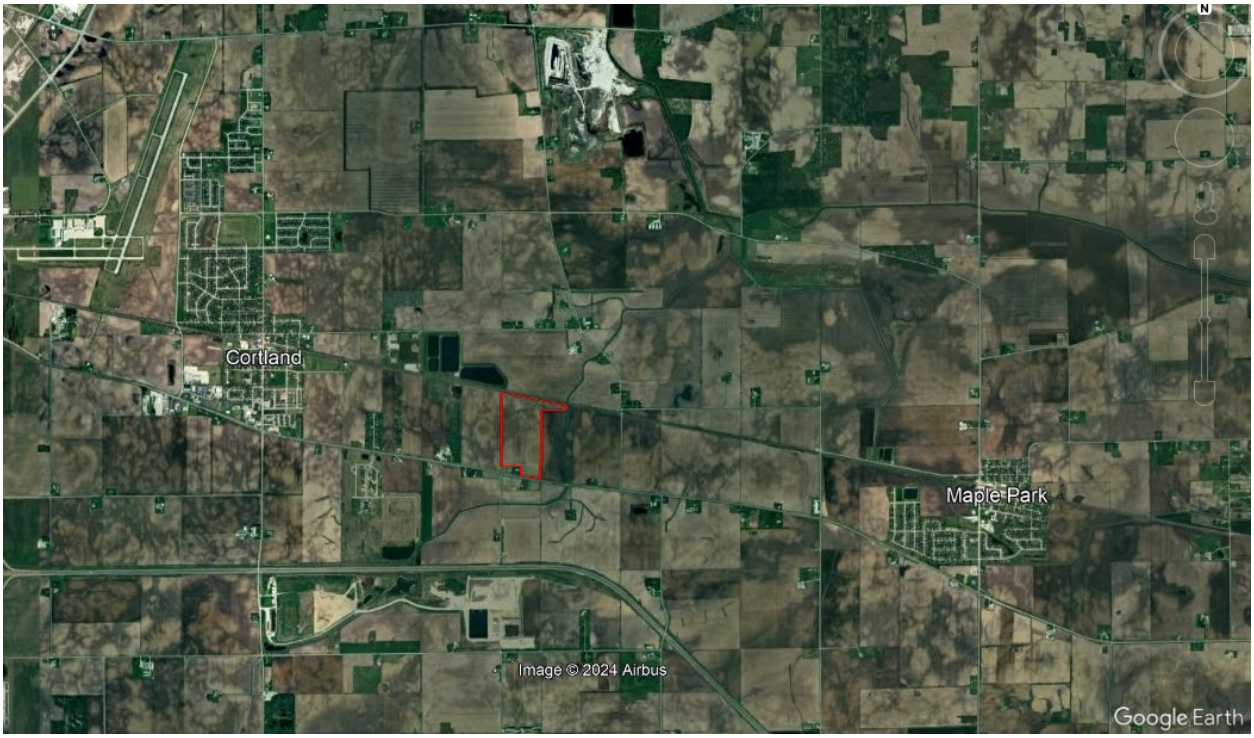
5-14-2024
Date

Parcel Location and Photos



Reproduced with the Permission of the Rockford Map Publishers Inc.

Legal Description of Property: *Part of the Southwest Quarter in Section 27 of Township 40 North, Range 5, East of the third principal meridian (Cortland Township).*



The parcel in question is located approximately 1.5 miles east of the Town of Cortland and 2.5 miles west of the Village of Maple Park (Google Earth).



The parcel in question is located north of the intersection of Chase Road and Lincoln Hwy 38 (Google Earth).



Aerial photo of parcel in question showing area of concentrated surface water flow (center of parcel flowing east) and ponding area in southern portion (Google Earth 7/2020).

Soils Information



Map Unit Legend (NRI 736)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	11.2	13.8%
Totals for Area of Interest		**80.9**	**100.0%**

Please refer to the Custom Soil Resource Report (Supplemental A) for additional soils information.

Archaeologic / Cultural Resources

Simply stated, cultural resources are all the past activities and accomplishments of people. They include the following: buildings; objects made or used by people; locations; and less tangible resources, such as stories, dance forms, and holiday traditions. The Soil and Water Conservation District most often encounters cultural resources as historical properties. These may be prehistoric or historical sites, buildings, structures, features, or objects.

The most common type of historical property that the Soil and Water Conservation District may encounter are non-structural archaeological sites. These sites often extend below the soil surface and must be protected against disruption by development or other earth moving activity if possible. Cultural resources are *non-renewable* because there is no way to "grow" a site to replace a disrupted site.

Landowners with historical properties on their land have ownership of that historical property. However, the State of Illinois owns all the following: human remains, grave markers, burial mounds, and artifacts associated with graves and human remains. Non-grave artifacts from archaeological sites and historical buildings are the property of the landowner. The landowner may choose to disturb a historical property but may not receive federal or state assistance to do so. If an earth moving activity disturbs human remains, the landowner must contact the county coroner within 48 hours.



Historic aerial photography *(1939 photo)* does not identify any historical structures within the parcel in question aside from the current farmstead.

The Illinois Historic Preservation Agency has not been notified of the proposed land use change by the DeKalb County SWCD. The applicant may need to contact the IHPA according to current Illinois Law.

Ecologically Sensitive Areas

What is Biological Diversity and why should it be conserved?

Biological diversity, or biodiversity, is the range of life on our planet. A more thorough definition is presented by botanist Peter H. Raven: "At the simplest level, biodiversity is the sum of all the plants, animals, fungi and microorganisms in the world, or in a particular area; all of their individual variation; and all of the interactions between them. It is the set of living organisms that make up the fabric of the planet Earth and allow it to function as it does, by capturing energy from the sun and using it to drive all of life's processes; by forming communities of organisms that have, through the several billion years of life's history on Earth, altered the nature of the atmosphere, the soil and the water of our Planet; and by making possible the sustainability of our planet through their life activities now" (Raven 1994).

It is not known how many species occur on our planet. Presently, about 1.4 million species have been named. It has been estimated that there are perhaps 9 million more that have not been identified. What is known is that they are vanishing at an unprecedented rate. Reliable estimates show extinction occurring at a rate several orders of magnitude above "background" in some ecological systems (Wilson 1992, Hoose 1981).

The reasons for protecting biological diversity are complex, but they fall into four major categories.

First, loss of diversity generally weakens entire natural systems. Healthy ecosystems tend to have many natural checks and balances. Every species plays a role in maintaining this system. When simplified by the loss of diversity, the system becomes more susceptible to natural and artificial perturbations. The chances of a system-wide collapse increase. In parts of the midwestern United States, for example, it was only the remnant areas of natural prairies that kept soil intact during the dust bowl years of the 1930s (Roush 1982).

Simplified ecosystems are almost always expensive to maintain. For example, when synthetic chemicals are relied upon to control pests, the target species are not the only ones affected. Their predators are almost always killed or driven away, exasperating the pest problem. In the meantime, people are unintentionally breeding pesticide-resistant pests. A process has begun where people become perpetual guardians of the affected area, which requires the expenditure of financial resources and human ingenuity to keep the system going.

A second reason for protecting biological diversity is that it represents one of our greatest untapped resources. Great benefits can be reaped from a single species. About 20 species provide 90% of the world's food. Of these 20, just three, wheat, maize, and rice-supply over one half of that food. American wheat farmers need new varieties every five to 15 years to compete with pests and diseases. Wild strains of wheat are critical genetic reservoirs for these new varieties.

Further, every species is a potential source of human medicine. In 1980, a published report identified the market value of prescription drugs from higher plants at over $3 billion. Organic alkaloids, a class of chemical compounds used in medicines, are found in an estimated 20% of plant species. Yet only 2% of plant species have been screened for these compounds (Hoose 1981).

The third reason for protecting diversity is that humans benefit from natural areas and depend on healthy ecosystems. The natural world supplies our air, our water, our food and supports human economic activity. Further, humans are creatures that evolved in a diverse natural environment between forest and grasslands. People need to be reassured that such places remain. When people speak of "going to the country," they generally mean more than getting out of town. For reasons of their own sanity and well-being, they need a holistic, organic experience. Prolonged exposure to urban monotony produces neuroses, for which cultural and natural diversity cure.

Historically, the lack of attention to biological diversity, and the ecological processes it supports, has resulted in economic hardships for segments of the basin's human population.

The final reason for protecting biological diversity is that species and natural systems are intrinsically valuable. The above reasons have focused on the benefits of the natural world to humans. All things possess intrinsic value simply because they exist.

Biological Resources Concerning the Subject Parcel

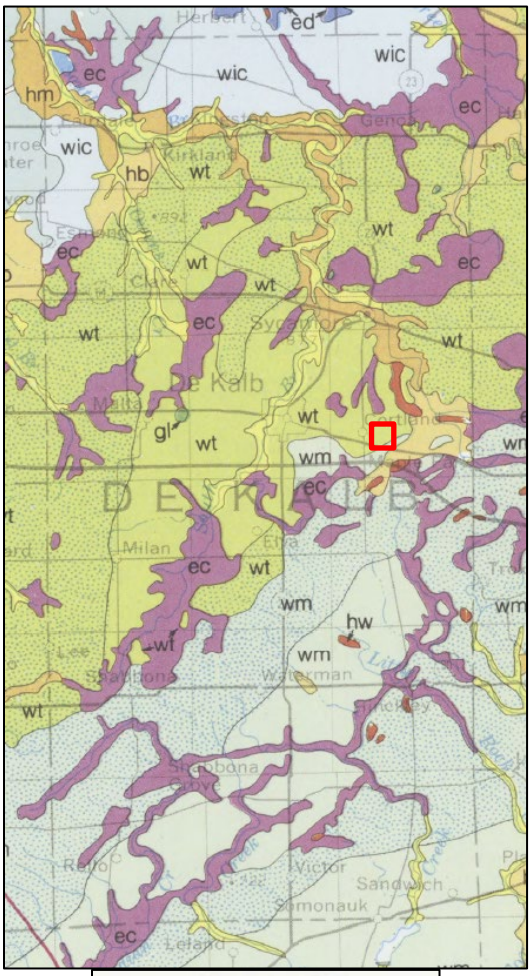
As part of the Natural Resources Information Report, staff checks office maps to determine if any nature preserves are in the general vicinity of the parcel in question. If there is a nature preserve in the area, then that resource will be identified as part of the report. The SWCD recommends that every effort be made to protect that resource. Such efforts should include, but are not limited to erosion control, sediment control, stormwater management, and groundwater monitoring.

Office maps do not indicate any ecologically sensitive area in the general vicinity of the parcel in question.

Geologic/Aquifer Information

Geology and the Proposed Land Use

Local geology plays an important role in determining the pollution potential. Groundwater pollution potential is an important factor when determining a specific area's suitability for a given land use. The local geology is an important element of the natural resource base. This information, when compared to soils information, gives a clearer picture of conditions on this parcel.

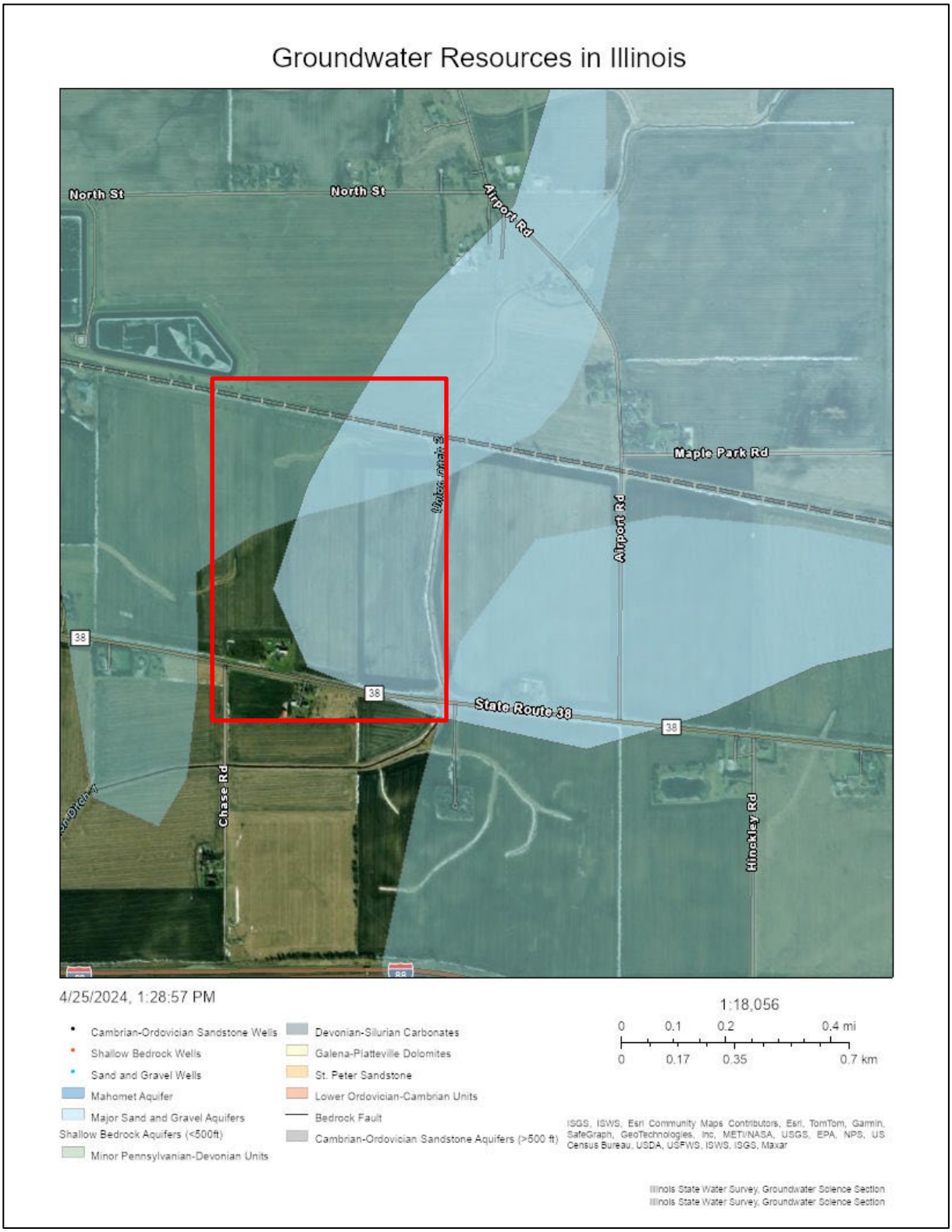


wt wd
wt-a wf

Tiskilwa Till Member of Wedron Formation
Ablation drift of Tiskilwa Till Member
Delavan Till Member of Wedron Formation
Fairgrange Till Member of Wedron Formation

Pink, pinkish-gray, gray, brown, and reddish-brown silty and sandy till; lenses of silt, sand, and gravel in some places. The Tiskilwa is generally sandy and silty till that is pinkish- or reddish-brown; includes yellow-gray to pinkish-gray sandy ablation drift (Gilberts Drift) in a small area in northeastern Illinois. The Delavan is gray to pinkish-gray sandy to silty till. The Fairgrange is pink, reddish-brown, and brownish-gray sandy till in east-central Illinois.

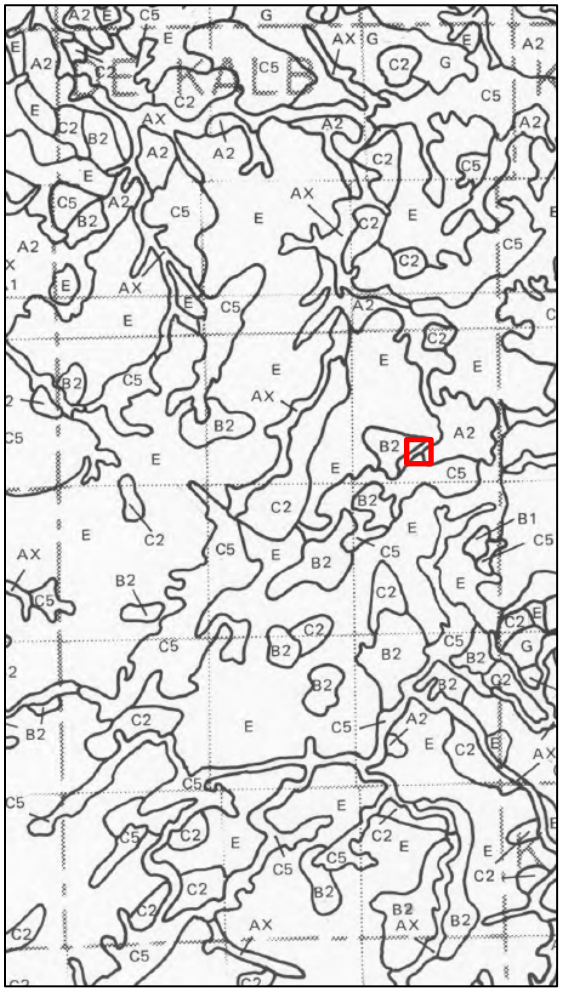
Aquifer Information



Based on Illinois State Water Survey maps this area has aquifer material identified within 50 feet of the surface and the potential for aquifer contamination is present.

Potential for Contamination of Shallow Aquifers in Illinois

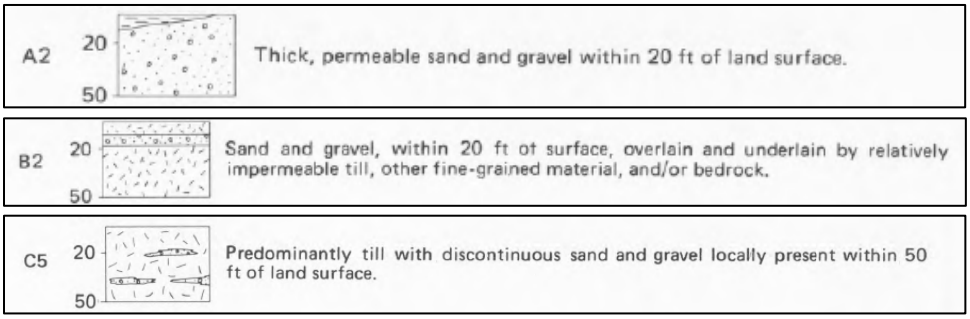
Illinois State Geological Survey



Primarily bedrock		Primarily glacial drift		Materials generally having few limitations
Limitation		Limitation		
Groundwater contamination potential	Trench construction problems and/or surface contamination	Groundwater contamination potential	Trench design problems and surface contamination	
A1	(A1)*	A2		
A3 A4 A5	(A4)		AX	
	BX	(B1) B2	B1 (B2)	
C1 C3 C4		C2		
		C5		(C5)
	(F)			D E F G

Figure 11 Summary: geologic limitations for land burial of municipal wastes. (*Map units in parentheses indicate secondary or local limitations.)

Approximate location of parcel in question.



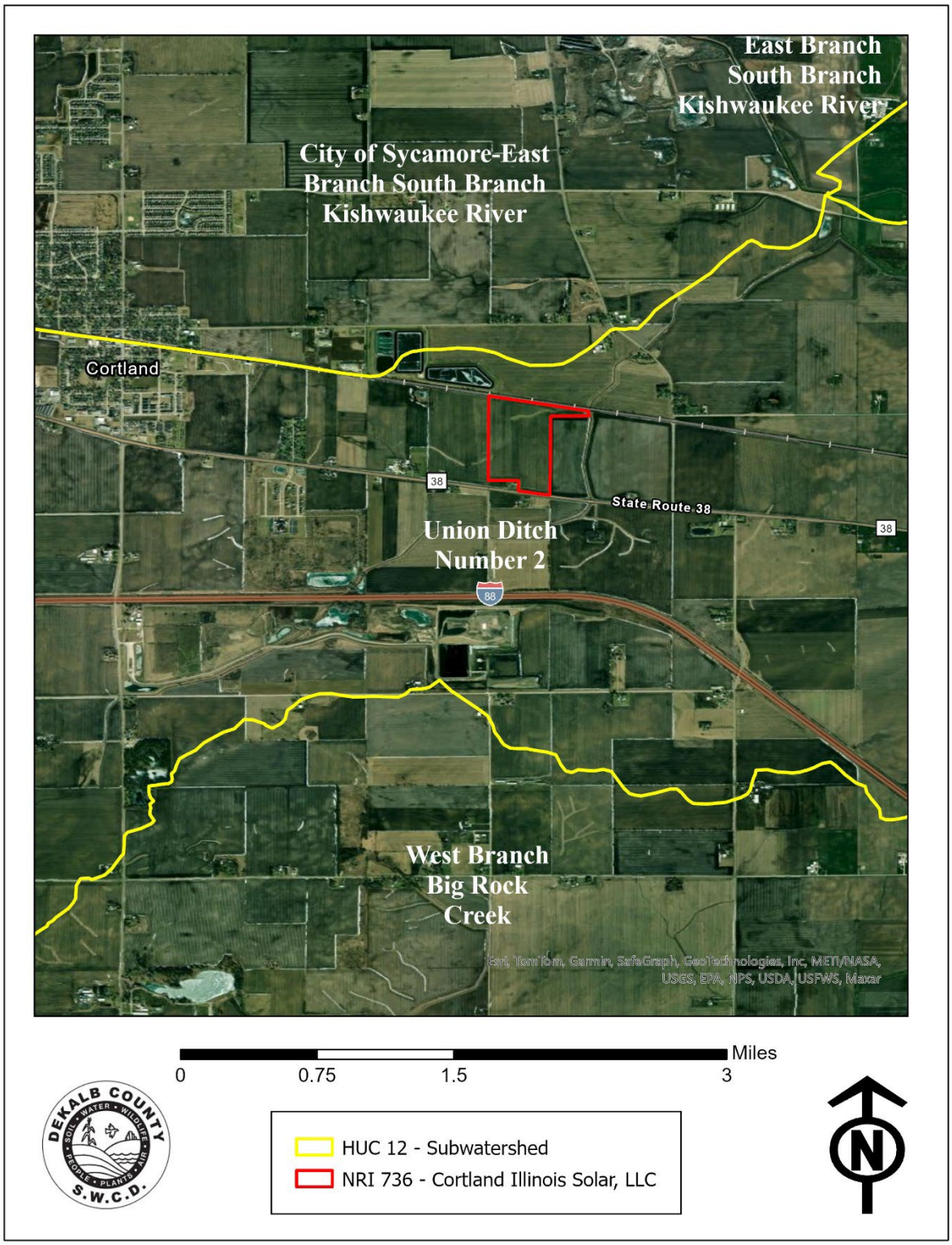
Watershed Information

Watershed and Subwatershed Information

A watershed is the area of land that drains into a specific point including a stream, lake, or other body of water. High points on the Earth's surface, such as hills and ridges define watersheds. When rain falls in the watershed, it flows across the ground towards a stream or lake. Rainwater carries any pollutants it comes in contact with such as oils, pesticides, and soil.

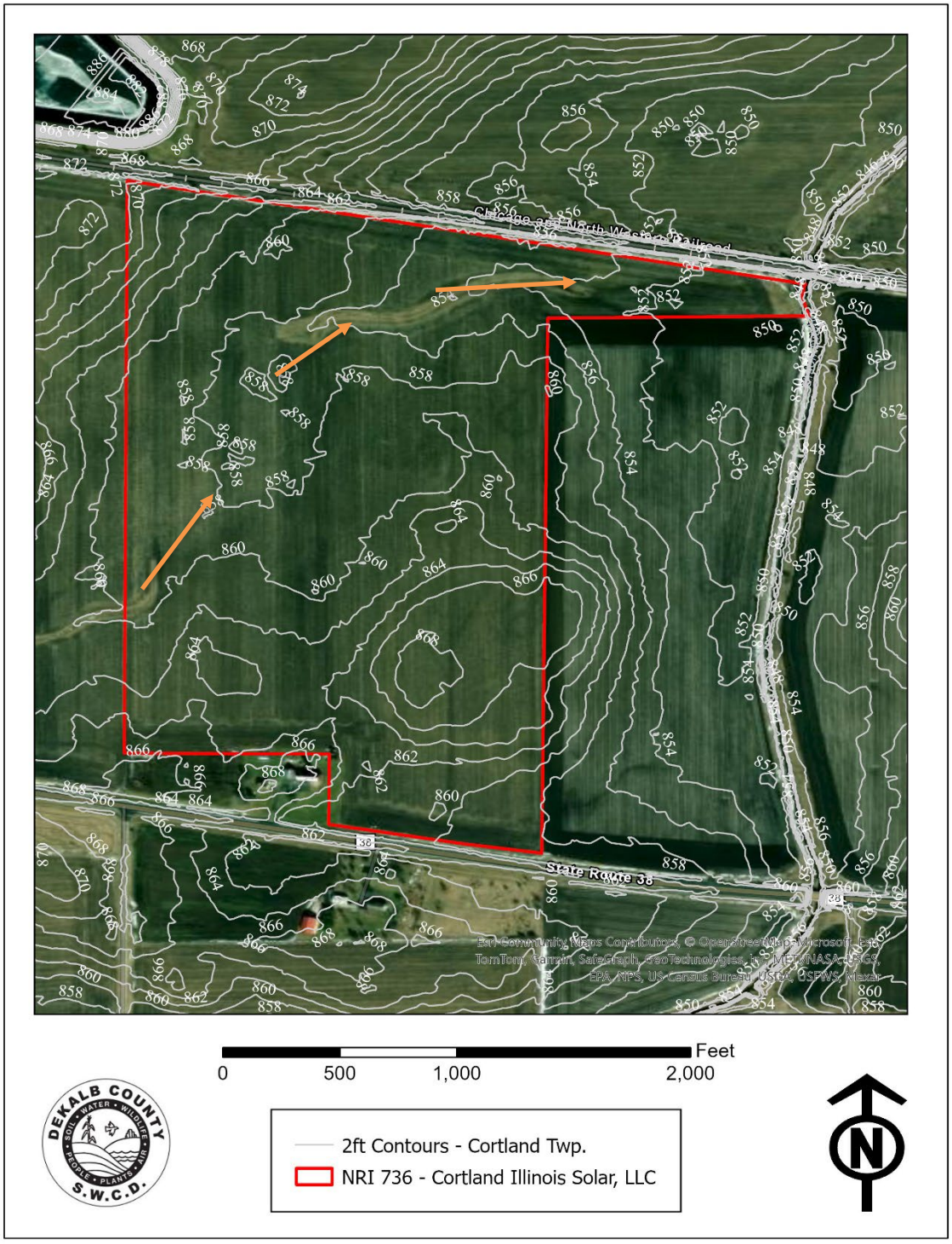
Everyone lives in a watershed. Their actions can impact natural resources and people living downstream. Residents and developers can minimize this impact by being aware of their environment and implications of their activities, implementing practices recommended in watershed plans and educating others about their watershed.

The parcel in question is located Union Ditch Number 2 (HUC 12). This subwatershed area is included within the Town of Cortland and DeKalb County approved IL-EPA East Branch South Branch Watershed Improvement Plan (2014). More information can be found about completed Watershed Improvement Plans and Best Management Practices at www.dekalbcountywatersheds-il.org



The parcel in question is located within Union Ditch Number 2 (HUC 12).

Topographic/FEMA Information



The elevation of this parcel ranges from 872 feet to 848 feet above sea level. The site largely drains to the northeast with approximately 20 feet of total fall.

Importance of Flood Information

A floodplain is defined as land adjoining a watercourse (riverine) or an inland depression (non-riverine) that is subject to periodic inundation by high water. Floodplains are important areas demanding protection since they have water storage and conveyance functions which affect upstream and downstream flows, water quality and quantity, and suitability of the land for human activity. Since floodplains play distinct and vital roles in the hydrologic cycle, development that interferes with their hydrologic and biologic functions should be carefully considered.

Flooding is both dangerous to people and destructive to their properties. The following maps, when combined with wetland and topographic information, can help developers and future homeowners to "sidestep" potential flooding or ponding problems.

FIRM is the acronym for the Flood Insurance Rate Map, produced by the Federal Emergency Management Agency. These maps define flood elevation adjacent to tributaries and major bodies of water and superimpose that onto a simplified USGS topographic map. The scale of the FIRM maps is generally dependent on the size and density of parcels in that area. (This is to correctly determine the parcel location and flood plain location.) The FIRM map has three (3) zones. A is the zone of 100-year flood, zone B is the 100 to 500 year flood, and zone C is outside the flood plain.

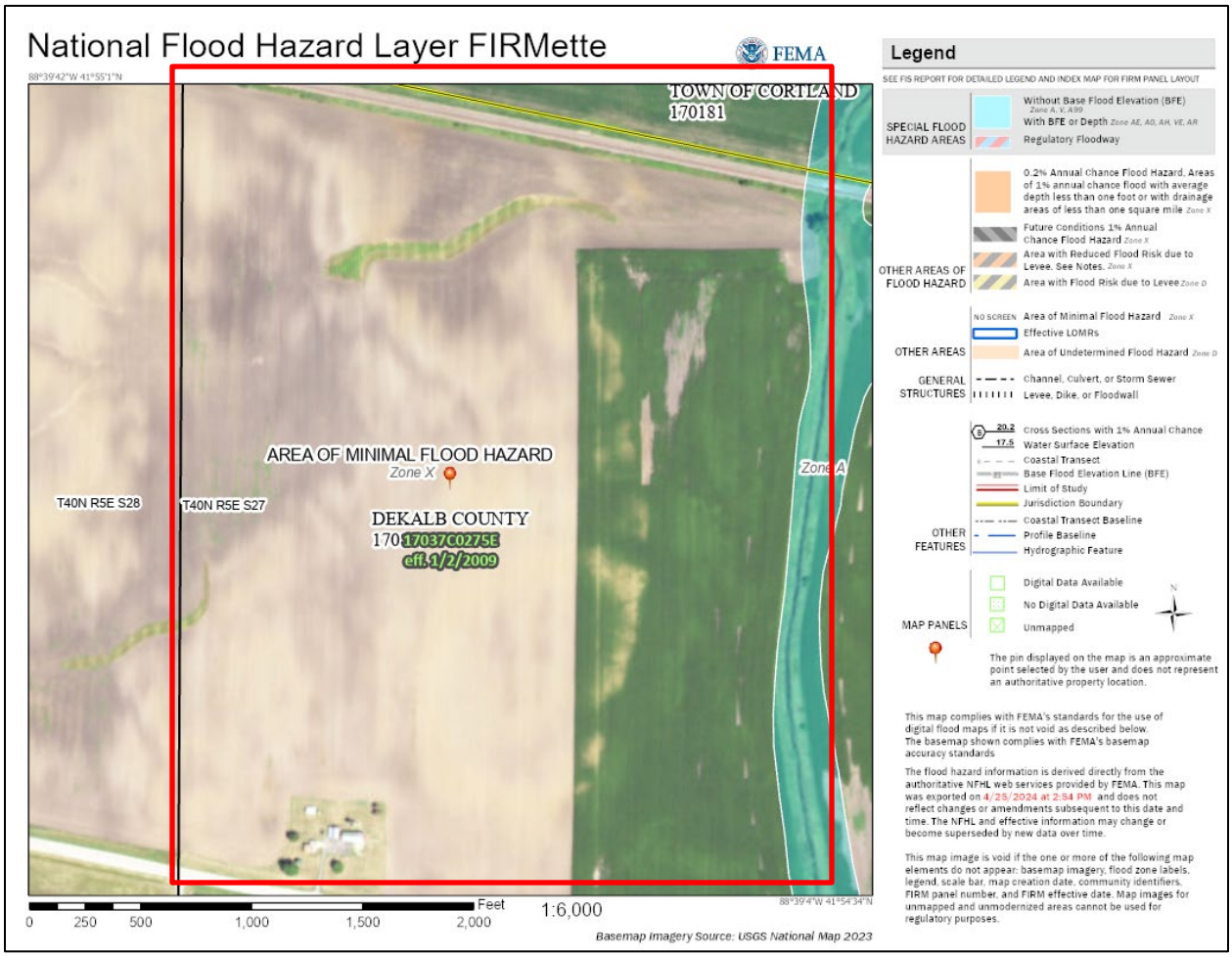
The Hydrologic Atlas (H.A.) Series of the Flood of Record Map is also used for the topographic information. This map is different from the FIRM map mainly because it will show isolated or pocketed flooded areas. DeKalb County uses both these maps in conjunction with each other for flooded area determinations. The Flood of Record maps, show the areas of flood for various years. Both of these maps stress that the recurrence of flooding is merely statistical. That is to say a 100-year flood may occur twice in one year, or twice in one week, for that matter.

It should be noted that greater floods than those shown on the two maps are possible. The flood boundaries indicated provide a historic record only until the map publication date. Additionally, these flood boundaries are a function of the watershed conditions existing when the maps were produced. Cumulative changes in runoff characteristics caused by urbanization can result in an increase in flood height of future flood episodes.

Floodplains play a vital role in reducing the flood damage potential associated with an urbanizing area and, when left in an undisturbed state, also provide valuable wildlife habitat benefits. If it is the petitioner's intent to conduct floodplain filling or modification activities, the petitioner, and the Unit of Government responsible need to consider the potentially adverse effects this type of action could have on adjacent properties. The change or loss of natural floodplain storage often increases the frequency and severity of flooding on adjacent property.

If the available maps indicate the presence of a floodplain on the PIQ, the petitioner should contact the IDOT-DWR and FEMA to delineate a floodplain elevation for the parcel. If a portion of the property is indeed floodplain, applicable state, county, and local regulations will need to be reflected in the site plans.

Another indication of flooding potential can be found in the soil's information. Hydric soils indicate the presence of drainageways, areas subject to ponding, or a naturally occurring high water table. These need to be considered along with the floodplain information when developing the site plan and the stormwater management plan. If the site does include these hydric soils and development occurs, thus raising the concerns of the loss of water storage in these soils and the potential for increased flooding in the area.



FEMA's National Flood Hazard Layer identify a small area in the Northeast corner of the parcel in question as a flood hazard area (Zone A).

Based on the proposed site plans this area will be out of the area of disturbance.

Soil Erosion and Sediment Control

Erosion is the wearing away of the soil by water, wind, and other forces. Soil erosion threatens the Nation's soil productivity and contributes the most pollutants in our waterways. Water causes about two thirds of erosion on agricultural land. Four properties, mainly, determine a soil's erodibility:

1. Texture 2. Slope 3. Structure 4. Organic matter content

Slope has the most influence on soil erosion potential when the site is under construction. Erosivity and runoff increase as slope grade increases. The runoff then exerts more force on the particles, breaking their bonds more readily and carrying them farther before deposition. The longer water flows along a slope before reaching a major waterway, the greater the potential for erosion.

Soil erosion during and after this proposed construction can be a primary non-point source of water pollution. Eroded soil during the construction phase can create unsafe conditions on roadways, decrease the storage capacity of lakes, clog streams and drainage channels, cause deterioration of aquatic habitats, and increase water treatment costs. Soil erosion also increases the risk of flooding by choking culverts, ditches, and storm sewers, and by reducing the capacity of natural and man-made detention facilities.

The general principles of erosion and sedimentation control measures include:

- reducing or diverting flow from exposed areas, storing flows, or limiting runoff from exposed areas,
- staging construction to keep disturbed areas to a minimum,
- establishing or maintaining or temporary or permanent groundcover,
- retaining sediment on site and
- professionally installing, inspecting, and maintaining control measures.

Erosion control practices are useful controls only if they are properly located, installed, inspected, and maintained.

The SWCD recommends an erosion control plan for all sites, especially if near a wetland or stream.

Map Unit Symbol	Map Unit Name	Acres	Percent
104A	Virgil silt loam, 0 to 2 percent slopes	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	11.2	13.8%
Eroded Soils		6.5	8.0%

Wetland Information

Importance of Wetland Information

Wetlands function in many ways to provide numerous benefits to society. They control flooding by offering a slow release of excess water downstream or through the soil. They cleanse water by filtering out sediment and some pollutants and can function as rechargers of our valuable groundwater. They also are essential breeding, rearing, and feeding grounds for many species of wildlife.

These benefits are particularly valuable in urbanizing areas as development activity typically adversely affects water quality, increases the volume of stormwater runoff, and increases the demand for groundwater. In an area where many individual homes rely on shallow groundwater wells for domestic water supplies, activities that threaten potential groundwater recharge areas are contrary to the public good. The conversion of wetlands, with their sediment trapping and nutrient absorbing vegetation, to biologically barren stormwater detention ponds can cause additional degradation of water quality in downstream or adjacent areas.

It has been estimated that over 95% of the wetlands that were historically present in Illinois have been destroyed while only recently has the true environmental significance of wetlands been fully recognized. America is losing 100,000 acres of wetlands a year and has saved 5 million acres total (since 1934). One acre of wetland can filter 7.3 million gallons of water a year. These are reasons why our wetlands are high quality and important.

This section contains the NRCS (Natural Resources Conservation Service) Wetlands Inventory, which is the most comprehensive inventory to date. The NRCS Wetlands Inventory is reproduced from an aerial photo at a scale of 1" equals 660 feet. The NRCS developed these maps in cooperation with U.S. EPA (Environmental Protection Agency,) and the U.S. Fish and Wildlife Service, using the National Food Security Act Manual, 3rd Edition. The main purpose of these maps is to determine wetland areas on agricultural fields and areas that may be wetlands but are in a non-agriculture setting.

The NRCS Wetlands Inventory in no way gives an exact delineation of the wetlands, but merely an outline, or the determination that there is a wetland within the outline. For the final, most accurate wetland **determination** of a specific wetland, a wetland ***delineation*** must be certified by NRCS staff using the National Food Security Act Manual (on agricultural land.) On urban land, a certified wetland delineator must perform the delineation using the ACOE 1987 Manual. *See the glossary section for the definitions of "delineation" and "determination."*



There are no areas within the project area that are identified as potential wetlands based on U.S. Fish and Wildlife Service National Wetland Inventory (NWI) maps.



A review of USDA-NRCS Wetlands Inventory maps identified no potential wetland area within the project area.

PLEASE READ THE FOLLOWING IF YOU ARE PLANNING TO DO ANY WORK NEAR A STREAM (THIS INCLUDES SMALL UNNAMED STREAMS), LAKE, WETLAND OR FLOODWAY.

The laws of the United States and the State of Illinois assign certain agencies specific and different regulatory roles to protect the waters within the State's boundaries. These roles, when considered together, include protection of navigation channels and harbors, protection against flood way encroachments, maintenance and enhancement of water quality, protection of fish and wildlife habitat and recreational resources, and, in general, the protection of total public interest. Unregulated use of the waters within the State of Illinois could permanently destroy or alter the character of these valuable resources and adversely impact the public. Therefore, please contact the proper regulatory authorities when planning any work associated with Illinois waters so that proper consideration and approval can be obtained.

WHO MUST APPLY

Anyone proposing to dredge, fill, rip rap, or otherwise alter the banks or beds of, or construct, operate, or maintain any dock, pier, wharf, sluice, dam, piling, wall, fence, utility, flood plain or flood way subject to State of Federal regulatory jurisdiction should apply for agency approvals.

REGULATORY AGENCIES:

- **Wetlands or U.S. Waters: U.S. Army Corps of Engineers**, Rock Island District, Clock Tower Building, P.O. Box 2004, Rock Island, IL 61204-2004. Phone: (309) 794-5379.
- **Flood plains: Illinois Department of Natural Resources \ Office of Water Resources**, Natural Resources Way, Springfield, IL 62702-1270.
- **Water Quality \ Erosion Control: Illinois Environmental Protection Agency**, Division of Water Pollution Control, Permit Section, Watershed Unit, 2200 Churchill Road, Springfield, IL 62706, phone (217)- 782-0610.

COORDINATION

We recommend early coordination with the regulatory agencies BEFORE finalizing work plans. This allows the agencies to recommend measures to mitigate or compensate for adverse impacts. Also, the agency can make possible environmental enhancement provisions early in the project planning stages. This could reduce the time required to process necessary approvals.

CAUTION: Contact with the United States Army Corps of Engineers is strongly advised before commencement of any work in or near a water of the United States. This could save considerable time and expense. Persons responsible for willful and direct violation of Section 10 of the River and Harbor Act of 1899 or Section 404 of the Federal Water Pollution Control Act are subject to fines ranging up to $27,500 per day of violation and imprisonment for up to one year or both.

Land Evaluation Site Assessment

(LESA) Background Information

The DeKalb County Land Evaluation and Site Assessment System (LESA) is designed to evaluate the viability of a site for agricultural uses. Although the framework of the system was developed by the Natural Resources Conservation Service of the U.S. Department of Agriculture, the contents of the County's LESA System were prepared locally to utilize soil survey information and interpretations and to incorporate local values and objectives regarding the protection of agricultural land use and the coordination of growth, affecting land development.

Decision makers use the LESA system to determine the suitability of a land use change and/or a zoning request as it relates to agricultural land. The LESA system is a two-step procedure that includes:

* Land Evaluation (LE), soils value
* Site Assessment (SA), land use

The systems two parts are evaluated based on the assignment of points, with a maximum of 300 total. The Land Evaluation has a maximum of 100 points and is used to rate farmland for its agricultural productivity and its prime farmland category. Generally, the Land Evaluation arranges the County's soils by their relative values, represented by a score of 0 to 100, with 0 being the worst for agriculture and 100 the best. The data for formulating the land evaluation is derived from the soil survey of DeKalb County.

Moreover, Land Evaluation encompasses information regarding soils found on the site and their suitability for agricultural purposes. The soils of DeKalb County consist of thirty-one different soil series ranging from very poorly drained Houghton Muck to well drained Harvard. DeKalb County is known for its highly productive agricultural soils such as Drummer, Flanagan and Muscatine. For the purposes of the Land Evaluation portion of the LESA system, each soil is rated higher on the overall LESA score. DeKalb County SWCD provides a weighted average of the soils using a simple, mechanical, unbiased method of determining agricultural suitability of soils on site.

The Site Assessment considers important factors other than soils relative to a specific parcel, which determine viability for agricultural use. The maximum number of points for the Site Assessment is 200. The Site Assessment identifies and weighs 15 criteria. The determination to include the specific site assessment factors directly resulted from the following:

* DeKalb County Zoning Ordinance
* Land Use Plan
* Health Department Criteria for Septic
* Other adopted county policies.

If a parcel were to receive a total of 215 points or more for the completed evaluation, that would indicate that the site has a high rating for agriculture. In utilizing the LESA System, the higher the point value, the greater the productivity and the more viable the site for agricultural use.

The DeKalb County LESA System is a valuable tool to guide land use decisions for the County. It does not take away the power of local officials to make land use decisions; rather, it assists them in making rational, consistent, and supportable land use decisions. Applications of the LESA System will generally fall under two types of requests involving conversion of land from agricultural use to non-agricultural use. The most frequent application of LESA will be when a request is made to rezone a tract of land from the County's agricultural districts to another zoning district or for special use. The LESA System can also be used to review state and federal projects for compliance with the Illinois Farmland Preservation Act and the Federal Farmland Protection Policy Act and their impact on important farmland.

In summary, the LESA evaluation addresses all factors, including soils information, together to provide a rational, consistent, unbiased determination of the impact to agriculture from the proposed land use and zoning changes.

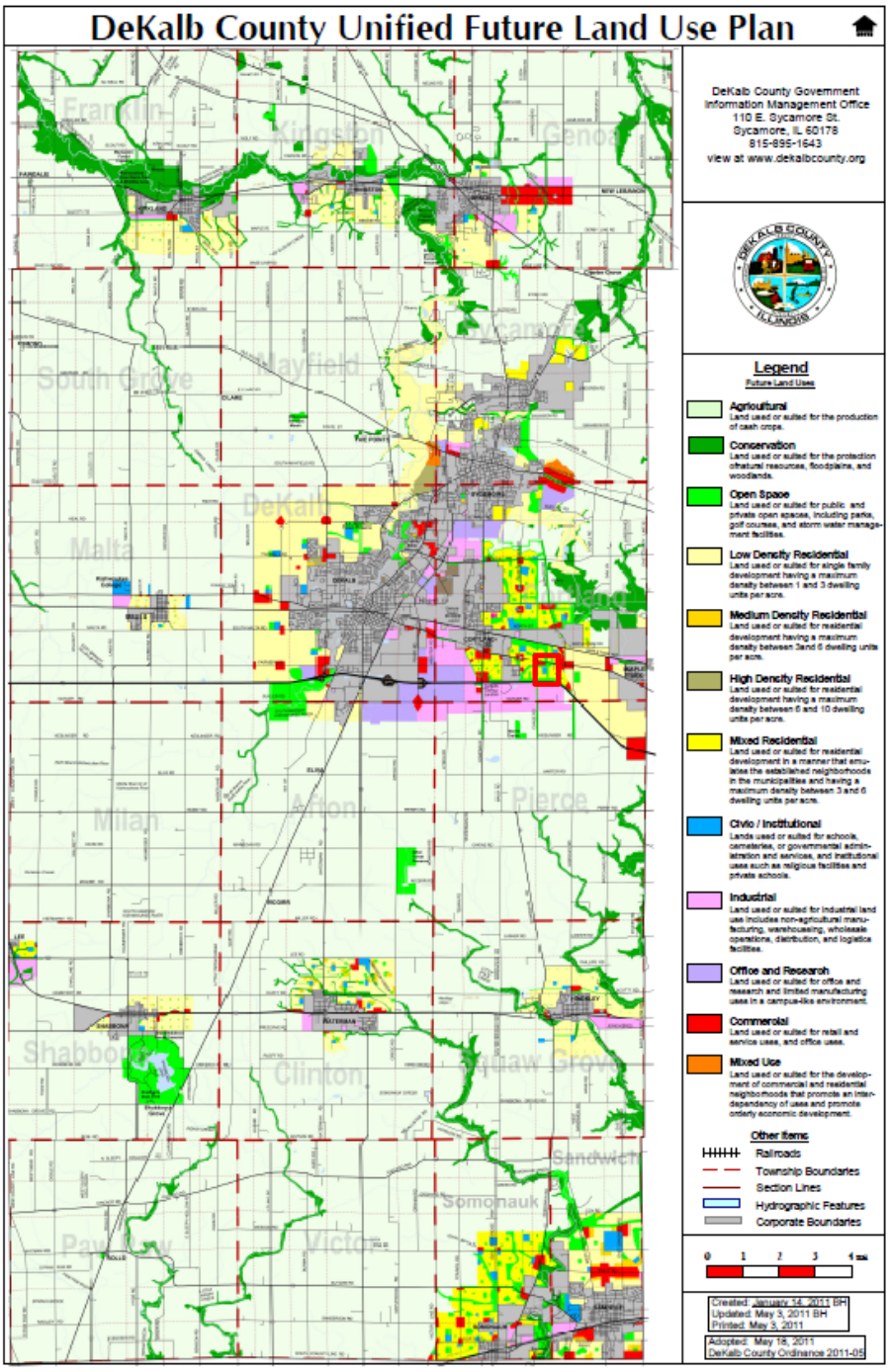
Figure 2. LAND EVALUATION (LE) WORKSHEET

Soil	Value Group	Percentage	Acreage	Value Factor	Adjusted Farm Unit Size	Adjusted Ag. Point Value
104A	3	18.1%	14.7	92	13.5	16.7
152A	1	26.3%	21.3	100	21.3	26.3
154A	1	3.9%	3.2	100	3.2	3.9
171B	2	1.1%	0.9	95	0.9	1.0
325C2	4	8.0%	6.5	76	4.9	6.1
512B	2	2.4%	1.9	95	1.8	2.3
667A	3	26.2%	21.2	89	18.9	23.3
667B	3	13.8%	11.2	88	9.9	12.1
Totals		100%	80.9		74.3	91.72

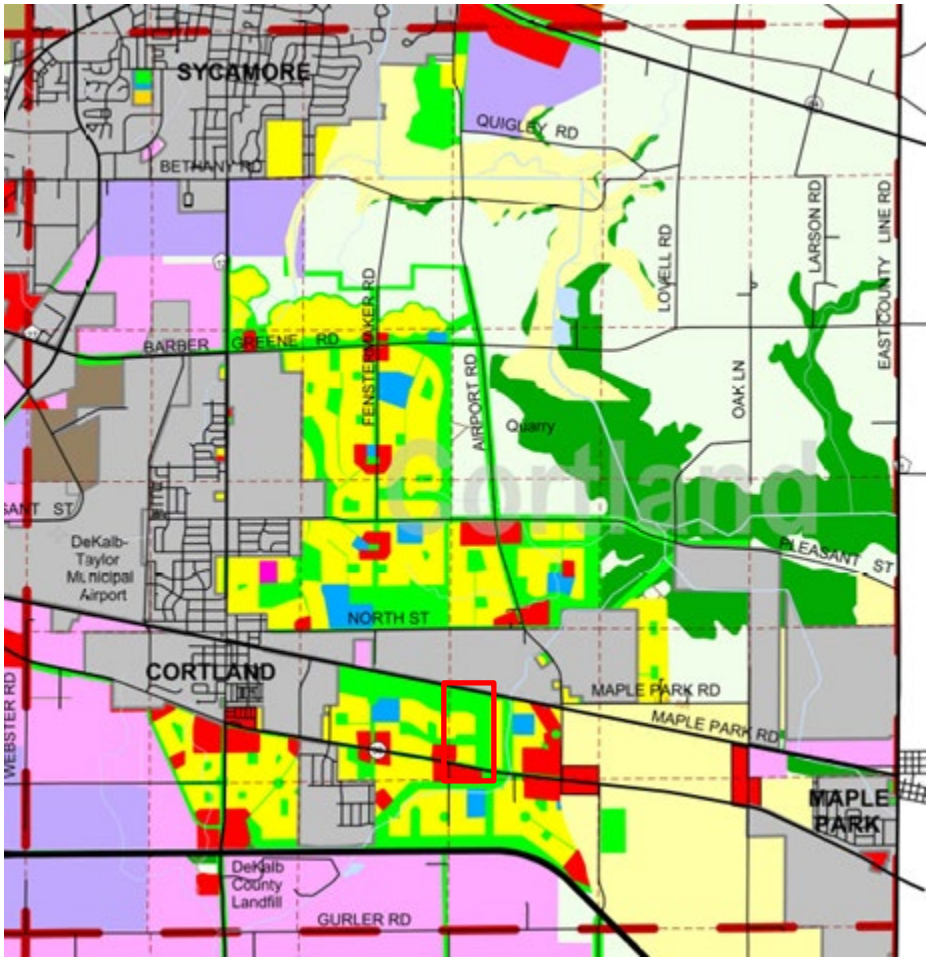
Explanation of the LE Worksheet

Soil Number: is the soil type of the polygon on the soils map.
Percentage and Acreage: the percentages of the parcel, and the area that the soil polygon represents.
Value: the numeric value from 0-100 that is assinged that soil units.
Adjusted Farm Unit Size: the acreage multiplied by the value of that soil unit.
Adjusted Ag. Point Value: the percentage multiplied by the value factor of that soil unit.
**** The LE score is the Total Value Number (shaded on the table)***
*Note: the soil types and percentages may differ from the limitations table for this calculation because of buildings, driveways, and other manmade impediments to agriculture. See figure 9 for the approximate "footprint" of the features (if any.)

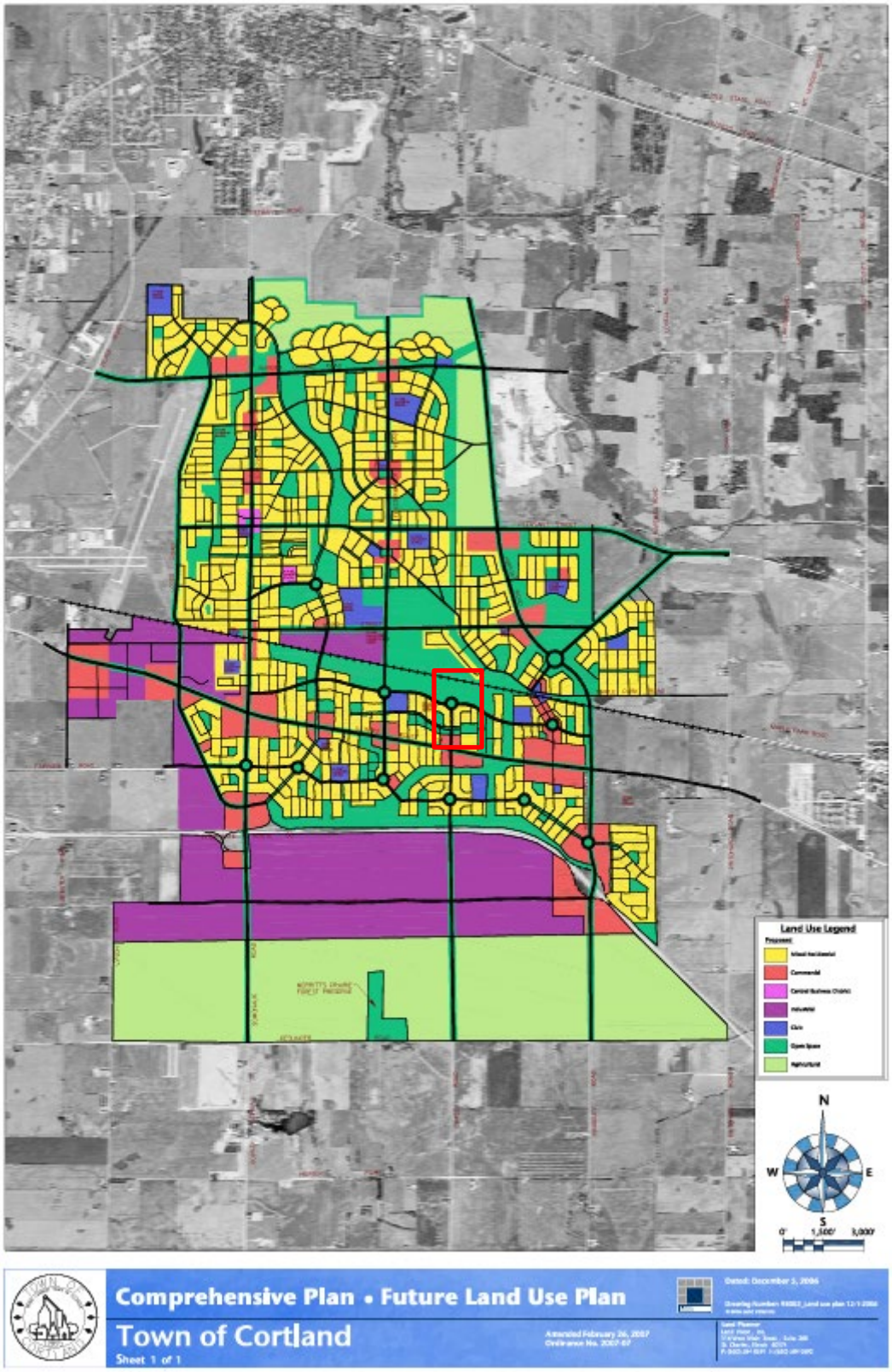
Future Land Use Plan Maps



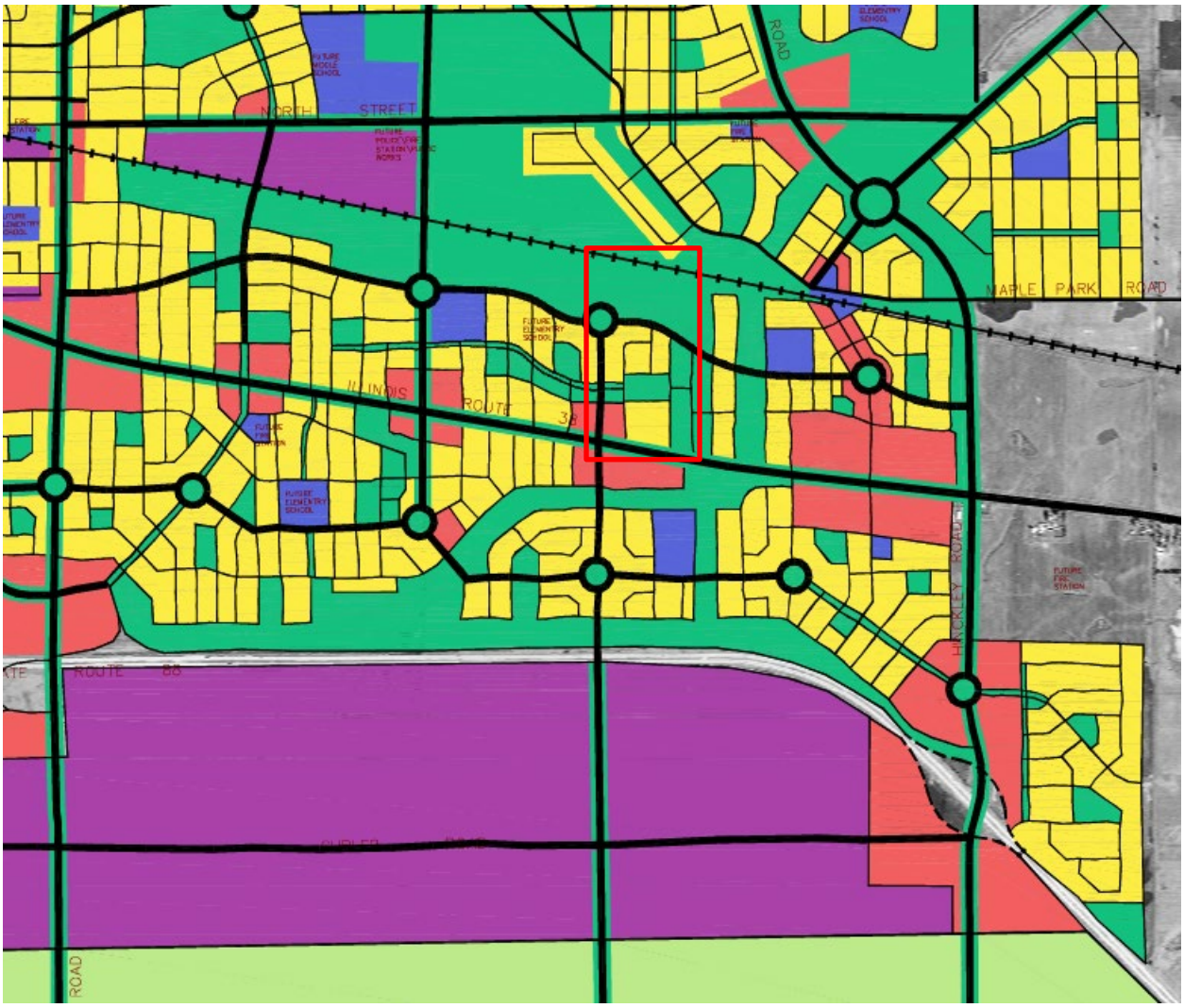
2011 DeKalb County Unified Future Land Use Plan Map



This parcel in question is located within an area identified for Open Space, Mixed Residential, and Commercial zoning in the 2011 DeKalb County Unified Future Land Use Plan Map.



2007 Cortland Future Land Use Plan



This parcel in question is located within an area identified for Open Space, Mixed Residential, and Commercial zoning in the 2007 Cortland Future Land Use Plan.

Glossary

AGRICULTURAL PROTECTION AREAS (AG AREAS) - Allowed by P.A. 81-1173. An AG AREA consists of a minimum of 350 acres of farmland, as contiguous and compact as possible. Petitioned by landowners, AG AREAS protect for a period of ten years initially, then reviewed every eight years thereafter. AG AREA establishment exempts landowners from local nuisance ordinances directed at farming operations, and designated land cannot receive special tax assessments on public improvements that do not benefit the land, e.g., water and sewer lines.

AGRICULTURE - The growing, harvesting and storing of crops including legumes, hay, grain, fruit and truck or vegetable including dairying, poultry, swine, sheep, beef cattle, pony and horse production, fur farms, and fish and wildlife farms; farm buildings used for growing, harvesting and preparing crop products for market, or for use on the farm; roadside stands, farm buildings for storing and protecting farm machinery and equipment from the elements, for housing livestock or poultry and for preparing livestock or poultry products for market; farm dwellings occupied by farm owners, operators, tenants or seasonal or year around hired farm workers.

B.G. - Below Grade. Under the surface of the Earth.

BEDROCK - Indicates depth at which bedrock occurs. Also lists hardness as rippable or hard.

FLOODING - Indicates frequency, duration, and period during year when floods are likely to occur.

HIGH LEVEL MANAGEMENT - The application of effective practices adapted to different crops, soils, and climatic conditions. Such practices include providing for adequate soil drainage, protection from flooding, erosion and runoff control, near optimum tillage, and planting the correct kind and amount of high-quality seed. Weeds, diseases, and harmful insects are controlled. Favorable soil reaction and near optimum levels of available nitrogen, phosphorus, and potassium for individual crops are maintained. Efficient use is made of available crop residues, barnyard manure, and/or green manure crops. All operations, when combined efficiently and timely, can create favorable growing conditions and reduce harvesting losses -- within limits imposed by weather.

HIGH WATER TABLE - A seasonal high-water table is a zone of saturation at the highest average depth during the wettest part of the year. May be apparent, perched, or artesian kinds of water tables.

Water Table, Apparent - A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water Table, Artesian - A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water Table, Perched - A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

DELINEATION - For Wetlands: A series of orange flags placed on the ground by a certified professional that outlines the wetland boundary on a parcel.

DETERMINATION - A polygon drawn on a map using map information that gives an outline of a wetland.

HYDRIC SOIL - This type of soil is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (USDA Natural Resources Conservation Service 1987)

INTENSIVE SOIL MAPPING - Mapping done on a smaller more intensive scale than a modern soil survey to determine soil properties of a specific site, e.g. mapping for septic suitability.

LAND EVALUATION AND SITE ASSESSMENT (L.E.S.A.) - LESA is a systematic approach for evaluating a parcel of land and to determine a numerical value for the parcel for farmland preservation purposes.

MODERN SOIL SURVEY - A soil survey is a field investigation of the soils of a specific area, supported by information from other sources. The kinds of soil in the survey area are identified and their extent shown on a map, and an accompanying report describes, defines, classifies, and interprets the soils. Interpretations predict the behavior of the soils under different used and the soils' response to management. Predictions are made for areas of soil at specific places. Soils information collected in a soil survey is useful in developing land-use plans and alternatives involving soil management systems and in evaluating and predicting the effects of land use.

PALUSTRINE - Name given to inland freshwater wetlands.

PERMEABILITY - Values listed estimate the range (in rate and time) it takes for downward movement of water in the major soil layers when saturated but allowed to drain freely. The estimates are based on soil texture, soil structure, available data on permeability and infiltration tests, and observation of water movement through soils or other geologic materials.

PIQ - Parcel in question

POTENTIAL FROST ACTION - Damage that may occur to structures and roads due to ice lens formation causing upward and lateral soil movement. Based primarily on soil texture and wetness.

PRIME FARMLAND - Prime farmland soils are lands that are best suited to food, feed, forage, fiber, and oilseed crops. It may be cropland, pasture, woodland, or other land, but it is not urban and built-up land or water areas. It either is used for food or fiber or is available for those uses. The soil qualities, growing season, and moisture supply are those needed for a well-managed soil economically to produce a sustained high yield of crops. Prime farmland produces in highest yields with minimum inputs of energy and economic resources and farming the land results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is

acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 5 percent. (Source USDA Natural Resources Conservation Service)

PRODUCTIVITY INDEXES - Productivity indexes for grain crops express the estimated yields of the major grain crops grown in Illinois as a single percentage of the average yields obtained under basic management from several of the more productive soils in the state. This group of soils is composed of the Muscatine, Ipava, Sable, Lisbon, Drummer, Flanagan, Littleton, Elburn, and Joy soils. Each of the 425 soils found in Illinois are found in Circular 1156 from the Illinois Cooperative Extension Service.

SEASONAL - When used in reference to wetlands indicates that the area is flooded only during a portion of the year.

SHRINK-SWELL POTENTIAL - Indicates volume changes to be expected for the specific soil material with changes in moisture content.

SOIL MAPPING UNIT - A map unit is a collection of soil areas of miscellaneous areas delineated in mapping. A map unit is generally an aggregate of the delineations of many different bodies of a kind of soil or miscellaneous area but may consist of only one delineated body. Taxonomic class names and accompanying phase terms are used to name soil map units. They are described in terms of ranges of soil properties within the limits defined for taxa and in terms of ranges of tax adjuncts and inclusions.

SOIL SERIES - A group of soils, formed from a particular type of parent material, having horizons that, except for texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

SUBSIDENCE - Applies mainly to organic soils after drainage. Soil material subsides due to shrinkage and oxidation.

TERRAIN - The area or surface over which a particular rock or group of rocks is prevalent.

TOPSOIL - That portion of the soil profile where higher concentrations of organic material, fertility, bacterial activity, and plant growth take place. Depths of topsoil vary between soil types.

WATERSHED - An area of land that drains to an associated water resource such as a wetland, river, or lake. Depending on the size and topography, watersheds can contain numerous tributaries, such as streams and ditches, and ponding areas such as detention structures, natural ponds, and wetlands.

WETLAND - An area that has a predominance of hydric soils and that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

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Wetlands - The Corps of Engineers' Administration of the Section 404.

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for DeKalb County, Illinois

NRI 736



April 25, 20

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....8
Soil Map (NRI 736).....9
Legend.....10
Map Unit Legend (NRI 736).....11
Map Unit Descriptions (NRI 736).....11
DeKalb County, Illinois.....13
104A—Virgil silt loam, 0 to 2 percent slopes.....13
152A—Drummer silty clay loam, 0 to 2 percent slopes.....14
154A—Flanagan silt loam, 0 to 2 percent slopes.....16
171B—Catlin silt loam, 2 to 5 percent slopes.....17
325C2—Dresden silt loam, 4 to 6 percent slopes, eroded.....18
512B—Danabrook silt loam, 2 to 5 percent slopes.....20
667A—Kaneville silt loam, 0 to 2 percent slopes.....21
667B—Kaneville silt loam, 2 to 5 percent slopes.....22
Soil Information for All Uses.....24
Suitabilities and Limitations for Use.....24
Building Site Development.....24
Solar Arrays, Soil-based Anchor Systems (NRI 736).....24
Unpaved Local Roads and Streets (NRI 736).....32
Land Classifications.....39
Farmland Classification (NRI 736).....39
Water Management.....44
Surface Water Management, System (NRI 736).....44
Soil Properties and Qualities.....50
Soil Qualities and Features.....50
Drainage Class (NRI 736).....50
Hydrologic Soil Group (NRI 736).....53
Water Features.....57
Depth to Water Table (NRI 736).....57
Flooding Frequency Class (NRI 736).....61
Ponding Frequency Class (NRI 736).....64
Soil Reports.....69
Soil Erosion.....69
RUSLE2 Related Attributes (NRI 736).....69
Water Features.....70
Hydrologic Soil Group and Surface Runoff (NRI 736).....70
References.....72

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N 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 1:12,000.

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: DeKalb County, Illinois
Survey Area Data: Version 18, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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 (NRI 736)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	11.2	13.8%
Totals for Area of Interest		**80.9**	**100.0%**

Map Unit Descriptions (NRI 736)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas

are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

DeKalb County, Illinois

104A—Virgil silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2wsqz
Elevation: 670 to 1,160 feet
Mean annual precipitation: 31 to 37 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Virgil and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Virgil

Setting

Landform: Drainageways on ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loess over loamy outwash and/or loamy till

Typical profile

Ap - 0 to 7 inches: silt loam
E - 7 to 13 inches: silt loam
Bt - 13 to 49 inches: silty clay loam
2Btg - 49 to 58 inches: loam
2C - 58 to 79 inches: stratified loamy sand to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R108XA014IL - Outwash Savanna
Forage suitability group: High AWC, high water table (G095BY007WI)
Other vegetative classification: High AWC, high water table (G095BY007WI)
Hydric soil rating: No

Minor Components

Drummer, drained

Percent of map unit: 4 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F095XB004WI - Wet Loamy or Clayey Lowland
Hydric soil rating: Yes

Pella

Percent of map unit: 4 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F095XB004WI - Wet Loamy or Clayey Lowland
Hydric soil rating: Yes

Sable

Percent of map unit: 2 percent
Landform: Depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F095XB004WI - Wet Loamy or Clayey Lowland
Hydric soil rating: Yes

152A—Drummer silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2ssrz
Elevation: 490 to 1,020 feet
Mean annual precipitation: 33 to 43 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 160 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Drummer, drained, and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Drummer, Drained

Setting

Landform: Swales on till plains, swales on outwash plains, stream terraces on till plains, stream terraces on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Parent material: Loess over stratified loamy outwash

Typical profile

Ap - 0 to 14 inches: silty clay loam
Btg - 14 to 41 inches: silty clay loam
2Btg - 41 to 47 inches: loam
2Cg - 47 to 60 inches: stratified sandy loam to clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow, R108XA013IL - Wet Outwash Prairie, R111XD020IN - Wet Outwash Mollisol
Hydric soil rating: Yes

Minor Components

Harpster, drained

Percent of map unit: 3 percent
Landform: Depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R110XY025IL - Ponded Calcareous Sedge Meadow
Hydric soil rating: Yes

Peotone, drained

Percent of map unit: 3 percent
Landform: Depressions on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip

Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

154A—Flanagan silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2ssry
Elevation: 570 to 990 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 160 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Flanagan and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Flanagan

Setting

Landform: Ground moraines, till plains
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 8 inches: silt loam
A - 8 to 18 inches: silty clay loam
Bt1 - 18 to 32 inches: silty clay loam
Bt2 - 32 to 45 inches: silty clay loam
2Bt3 - 45 to 49 inches: silt loam
2C - 49 to 60 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 6.0
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C/D
Ecological site: R108XA006IL - Loess Upland Prairie
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: No

Minor Components

Elpaso, drained

Percent of map unit: 4 percent
Landform: Till plains, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow, R108XA007IL - Wet Loess Upland Prairie, R108XA008IL - Ponded Loess Sedge Meadow
Other vegetative classification: Grass/Prairie (Herbaceous Vegetation)
Hydric soil rating: Yes

Urban land

Percent of map unit: 1 percent
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

171B—Catlin silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2t6zl
Elevation: 590 to 980 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 155 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Catlin and similar soils: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Catlin

Setting

Landform: Moraines, till plains

Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over loamy till

Typical profile

Ap - 0 to 11 inches: silt loam
AB - 11 to 16 inches: silty clay loam
Bt - 16 to 41 inches: silty clay loam
2BC - 41 to 45 inches: clay loam
2C - 45 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R108XA006IL - Loess Upland Prairie
Hydric soil rating: No

Minor Components

Urban land

Percent of map unit: 1 percent
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

325C2—Dresden silt loam, 4 to 6 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2wspz
Elevation: 690 to 1,030 feet
Mean annual precipitation: 35 to 37 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 138 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Dresden, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dresden, Eroded

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loess and/or loamy glaciofluvial deposits over sandy and gravelly outwash

Typical profile

Ap - 0 to 7 inches: silt loam
Bt1 - 7 to 18 inches: silty clay loam
2Bt2 - 18 to 31 inches: sandy clay loam
3C - 31 to 79 inches: stratified gravelly loamy sand to extremely gravelly coarse sand

Properties and qualities

Slope: 4 to 6 percent
Depth to restrictive feature: 30 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: R110XY009IL - Dry Glacial Drift Upland Savanna, R108XA014IL - Outwash Savanna
Forage suitability group: Mod AWC, adequately drained (G095BY005WI)
Other vegetative classification: Mod AWC, adequately drained (G095BY005WI)
Hydric soil rating: No

Minor Components

Kane

Percent of map unit: 6 percent
Landform: Plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland
Hydric soil rating: No

Will

Percent of map unit: 4 percent
Landform: Plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

512B—Danabrook silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2ytdf
Elevation: 800 to 930 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Danabrook and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Danabrook

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over till

Typical profile

Ap - 0 to 13 inches: silt loam
Bt - 13 to 33 inches: silty clay loam
2Bt - 33 to 42 inches: clay loam
2C - 42 to 60 inches: loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F095XB007WI - Loamy Upland with Carbonates
Hydric soil rating: No

Minor Components

Drummer, drained

Percent of map unit: 8 percent
Landform: Swales on outwash plains, ground moraines, stream terraces on outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: F095XB004WI - Wet Loamy or Clayey Lowland
Hydric soil rating: Yes

667A—Kaneville silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 65c6
Elevation: 590 to 1,020 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 160 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kaneville and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kaneville

Setting

Landform: Stream terraces, outwash plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 42 inches: silty clay loam

H3 - 42 to 56 inches: loam
H4 - 56 to 80 inches: stratified clay loam to loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Ecological site: R108XA014IL - Outwash Savanna
Hydric soil rating: No

Minor Components

Drummer

Percent of map unit: 8 percent
Landform: Outwash plains, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XA013IL - Wet Outwash Prairie, R110XY008IL - Wet Glacial Drift Upland Prairie
Hydric soil rating: Yes

667B—Kaneville silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 65c7
Elevation: 590 to 1,020 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 160 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kaneville and similar soils: 92 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kaneville

Setting

Landform: Stream terraces, outwash plains
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess and in the underlying outwash

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 44 inches: silty clay loam
H3 - 44 to 52 inches: silt loam
H4 - 52 to 80 inches: stratified clay loam to loamy sand

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R108XA014IL - Outwash Savanna
Hydric soil rating: No

Minor Components

Drummer

Percent of map unit:
Landform: Ground moraines, outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XA013IL - Wet Outwash Prairie, R110XY008IL - Wet Glacial Drift Upland Prairie
Hydric soil rating: Yes

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Building Site Development

Building site development interpretations are designed to be used as tools for evaluating soil suitability and identifying soil limitations for various construction purposes. As part of the interpretation process, the rating applies to each soil in its described condition and does not consider present land use. Example interpretations can include corrosion of concrete and steel, shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping.

Solar Arrays, Soil-based Anchor Systems (NRI 736)

ENG - Engineering

Ground-based Solar Arrays, Soil-penetrating Anchor Systems

Ground-based solar arrays are sets of photovoltaic panels that are not situated on a building or pole. These installations consist of a racking system that holds the panel in the desired orientation and the foundation structures that hold the racking system to the ground. Two basic methods are used to hold the systems to the ground, based on site conditions and cost. One method employs driven piles, screw augers, or concrete piers that penetrate into the soil to provide a stable foundation. The ease of installation and general site suitability of soil-penetrating anchoring systems depends on soil characteristics such as rock fragment content, soil depth, soil strength, soil corrosivity, shrink-swell tendencies, and drainage. The other basic anchoring system utilizes precast ballasted footings or ballasted trays on the soil surface to make the arrays too heavy to move. The site considerations that impact both basic systems are slope, slope aspect, wind speed, land surface shape,

flooding, and ponding. Other factors that will contribute to the function of a solar power array include daily hours of sunlight and shading from hills, trees or buildings.

Soil-penetrating anchoring systems can be used where the soil conditions are not limited. Installation of these systems requires some power equipment for hauling components and either driving piles, turning helices, or boring holes to install the anchoring apparatus.

Soils can be a non-member, partial member or complete members of the set of soils that are limited for "Ground-based Solar Panel Arrays". If a soil's property within 150 cm (60 inches) of the soil surface has a membership indices greater than zero, then that soil property is limiting and the soil restrictive feature is identified. The overall interpretive rating assigned is the maximum membership indices of each soil interpretive property that comprise the "Ground-based Solar Panel Array" interpretive rule. Minor restrictive soil features are identified but not considered as part of the overall rating process. These restrictive features could be important factors where the major restrictive features are overcome through design application.

Soils are placed into interpretive rating classes per their rating indices. These are not limited (rating index = 0), somewhat limited (rating index greater than 0 and less than 1.0), or very limited (rating index = 1.0).

Numerical ratings indicate the degree of limitation. The ratings are shown in decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil has the least similarity to a good site (1.00) and the point at which the soil feature is very much like known good sites (0).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

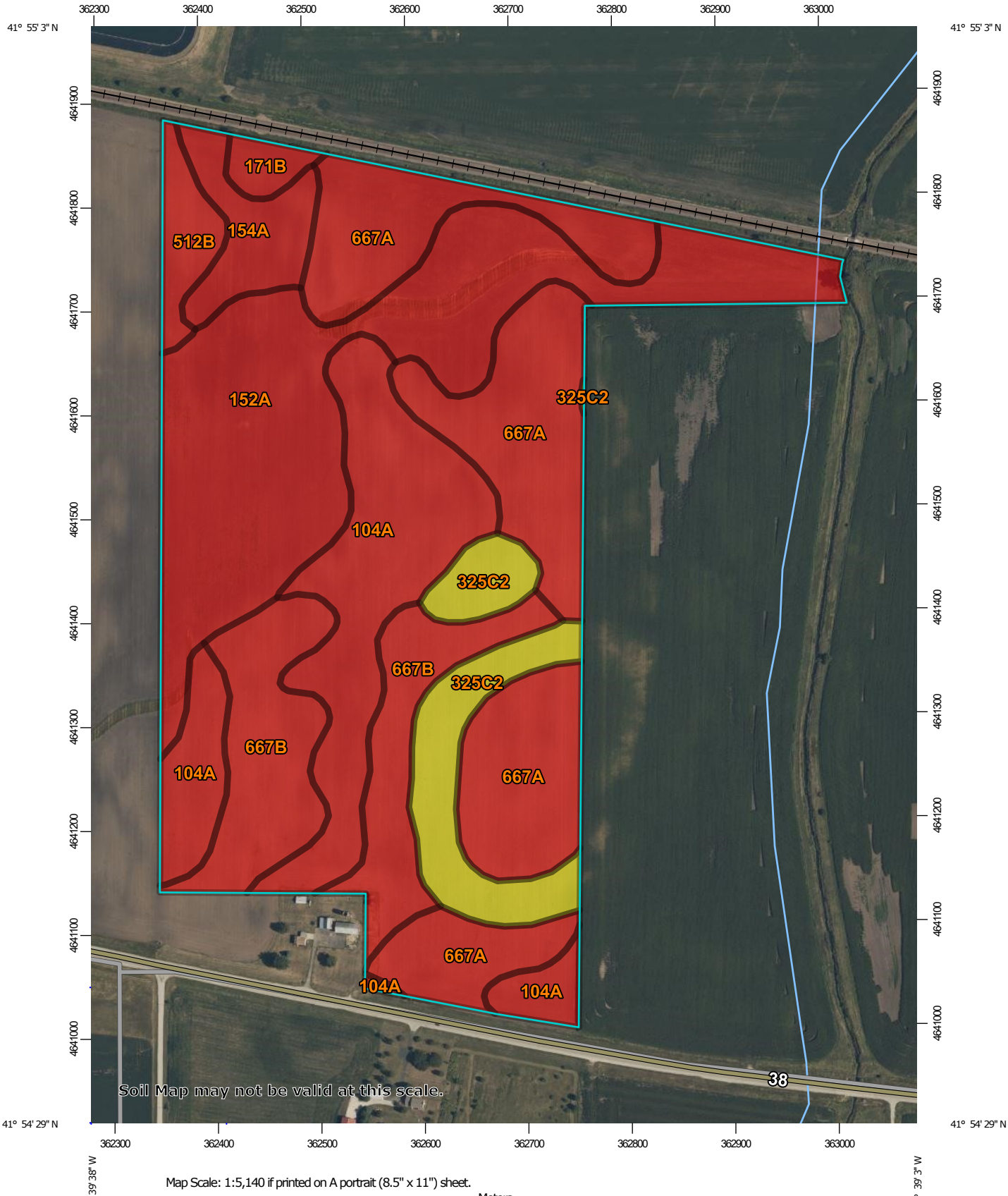
Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

References:

Canada, S. 2012. Corrosion impacts on steel piles. Solarpro. Solarprofessional.com.

Romanoff, Melvin. 1962. Corrosion of Steel Pilings in Soils. Journal of Research of the National Bureau of Standards. (Volume 66C, No. 3). July/September, 1962.

Custom Soil Resource Report
Map—Solar Arrays, Soil-based Anchor Systems (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

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 1:12,000.

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: DeKalb County, Illinois
Survey Area Data: Version 18, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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.

Tables—Solar Arrays, Soil-based Anchor Systems (NRI 736)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	Very limited	Virgil (90%)	Frost action (1.00)	14.7	18.1%
				Low strength (1.00)		
				Depth to saturated zone (0.94)		
				Steel corrosion (0.75)		
				Shrink-swell (0.27)		
			Drummer, drained (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Steel corrosion (0.75)		
			Pella (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.99)		
				Slope shape across (0.30)		
			Sable (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Steel corrosion (0.75)		
152A	Drummer silty clay loam, 0 to 2 percent slopes	Very limited	Drummer, drained (94%)	Ponding (1.00)	21.3	26.3%

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Steel corrosion (0.75)		
			Harpster, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Steel corrosion (0.75)		
			Peotone, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
154A	Flanagan silt loam, 0 to 2 percent slopes	Very limited	Flanagan (95%)	Low strength (1.00)	3.2	3.9%
				Shrink-swell (0.89)		
				Steel corrosion (0.75)		
				Depth to saturated zone (0.75)		
				Frost action (0.50)		
			Elpaso, drained (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Steel corrosion (0.75)		
171B	Catlin silt loam, 2 to 5 percent slopes	Very limited	Catlin (99%)	Frost action (1.00)	0.9	1.1%
				Low strength (1.00)		
				Steel corrosion (0.75)		
				Shrink-swell (0.61)		
				Hillslope position (0.25)		
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	Somewhat limited	Dresden, eroded (90%)	Steel corrosion (0.75)	6.5	8.0%
				Frost action (0.50)		
				Low strength (0.00)		
512B	Danabrook silt loam, 2 to 5 percent slopes	Very limited	Danabrook (92%)	Frost action (1.00)	1.9	2.4%
				Low strength (0.93)		
				Steel corrosion (0.75)		
				Hillslope position (0.25)		
				Shrink-swell (0.21)		
			Drummer, drained (8%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Steel corrosion (0.75)		
667A	Kaneville silt loam, 0 to 2 percent slopes	Very limited	Kaneville (92%)	Frost action (1.00)	21.2	26.2%
				Low strength (0.96)		
				Steel corrosion (0.75)		
				Shrink-swell (0.50)		
				Hillslope position (0.25)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
			Drummer (8%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Steel corrosion (0.75)		
667B	Kaneville silt loam, 2 to 5 percent slopes	Very limited	Kaneville (92%)	Frost action (1.00)	11.2	13.8%
				Low strength (0.96)		
				Steel corrosion (0.75)		
				Shrink-swell (0.50)		
				Hillslope position (0.25)		
Totals for Area of Interest					**80.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	74.4	92.0%
Somewhat limited	6.5	8.0%
Totals for Area of Interest	**80.9**	**100.0%**

Rating Options—Solar Arrays, Soil-based Anchor Systems (NRI 736)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Unpaved Local Roads and Streets (NRI 736)

ENG - Engineering

Unpaved local roads and streets are those roads and streets that carry traffic year round but have a graded surface of local soil material or aggregate.

Description:

Unpaved local roads and streets are those roads and streets that carry traffic year round but have a graded surface of local soil material or aggregate.

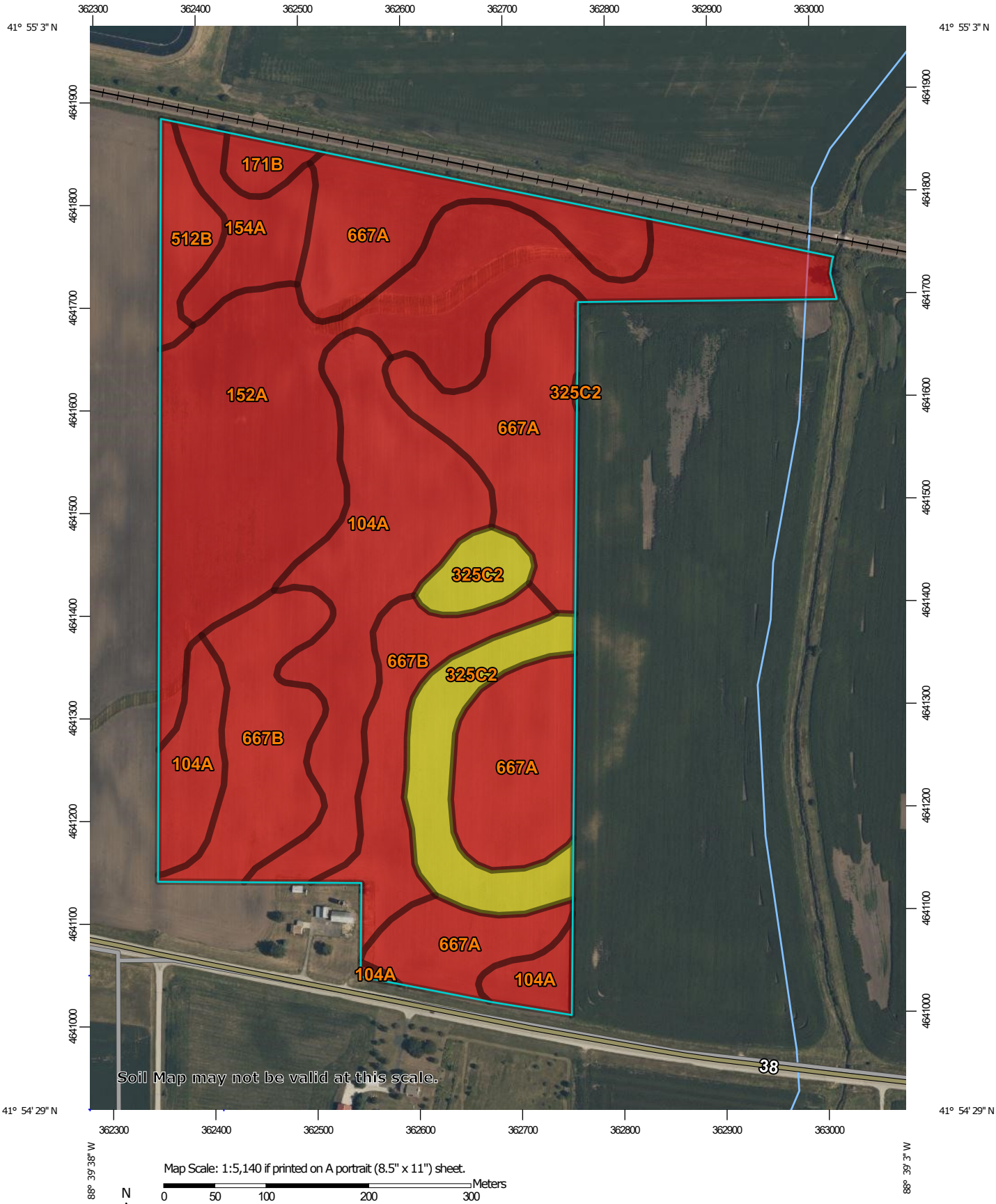
The roads and streets consist of

(1) the underlying local soil material, either cut or fill, which is called "the sub-grade";

(2) the surface, which may be the same as the subgrade or may have aggrate such as crushed limestone added.

They are graded to shed water, and conventional drainage measures are provided. These roads and streets are built mainly from the soil at the site. Soil interpretations for local roads and streets are used as a tool in evaluating soil suitability and identifying soil limitations for the practice. The rating is for soils in their present condition and does not consider present land use. Soil properties and qualities that affect local roads and streets are those that influence the ease of excavation and grading and the traffic-supporting capacity. The properties and qualities that affect the ease of excavation and grading are hardness of bedrock or a cemented pan, depth to bedrock or a cemented pan, depth to a water table, flooding, the amount of large stones, and slope. The properties that affect traffic-supporting capacity are soil strength as inferred from the AASHTO group index and the Unified classification, subsidence, shrink-swell behavior, potential frost action, and depth to the seasonal high water table. The dust generating tendacy of the soil is also considered.

Custom Soil Resource Report
Map—Unpaved Local Roads and Streets (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

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 1:12,000.

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: DeKalb County, Illinois
Survey Area Data: Version 18, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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.

Tables—Unpaved Local Roads and Streets (NRI 736)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	Very limited	Virgil (90%)	Frost action (1.00)	14.7	18.1%
				Low strength (1.00)		
				Depth to saturated zone (0.94)		
				Shrink-swell (0.27)		
				Dusty (0.05)		
			Drummer, drained (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.44)		
			Pella (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (0.99)		
				Shrink-swell (0.24)		
			Sable (2%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.52)		
152A	Drummer silty clay loam, 0 to 2 percent slopes	Very limited	Drummer, drained (94%)	Ponding (1.00)	21.3	26.3%
				Depth to saturated zone (1.00)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.37)		
			Harpster, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.29)		
			Peotone, drained (3%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Shrink-swell (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
154A	Flanagan silt loam, 0 to 2 percent slopes	Very limited	Flanagan (95%)	Low strength (1.00)	3.2	3.9%
				Shrink-swell (0.89)		
				Depth to saturated zone (0.75)		
				Frost action (0.50)		
				Dusty (0.06)		
			Elpaso, drained (4%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.24)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
171B	Catlin silt loam, 2 to 5 percent slopes	Very limited	Catlin (99%)	Frost action (1.00)	0.9	1.1%
				Low strength (1.00)		
				Shrink-swell (0.61)		
				Dusty (0.05)		
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	Somewhat limited	Dresden, eroded (90%)	Frost action (0.50)	6.5	8.0%
				Dusty (0.04)		
				Low strength (0.00)		
512B	Danabrook silt loam, 2 to 5 percent slopes	Very limited	Danabrook (92%)	Frost action (1.00)	1.9	2.4%
				Low strength (0.93)		
				Shrink-swell (0.21)		
				Dusty (0.04)		
			Drummer, drained (8%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.65)		
667A	Kaneville silt loam, 0 to 2 percent slopes	Very limited	Kaneville (92%)	Frost action (1.00)	21.2	26.2%
				Low strength (0.96)		
				Shrink-swell (0.50)		
				Dusty (0.04)		
			Drummer (8%)	Ponding (1.00)		
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.50)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
667B	Kaneville silt loam, 2 to 5 percent slopes	Very limited	Kaneville (92%)	Frost action (1.00)	11.2	13.8%
				Low strength (0.96)		
				Shrink-swell (0.50)		
				Dusty (0.05)		
Totals for Area of Interest					**80.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	74.4	92.0%
Somewhat limited	6.5	8.0%
Totals for Area of Interest	**80.9**	**100.0%**

Rating Options—Unpaved Local Roads and Streets (NRI 736)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification (NRI 736)

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Custom Soil Resource Report
Map—Farmland Classification (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

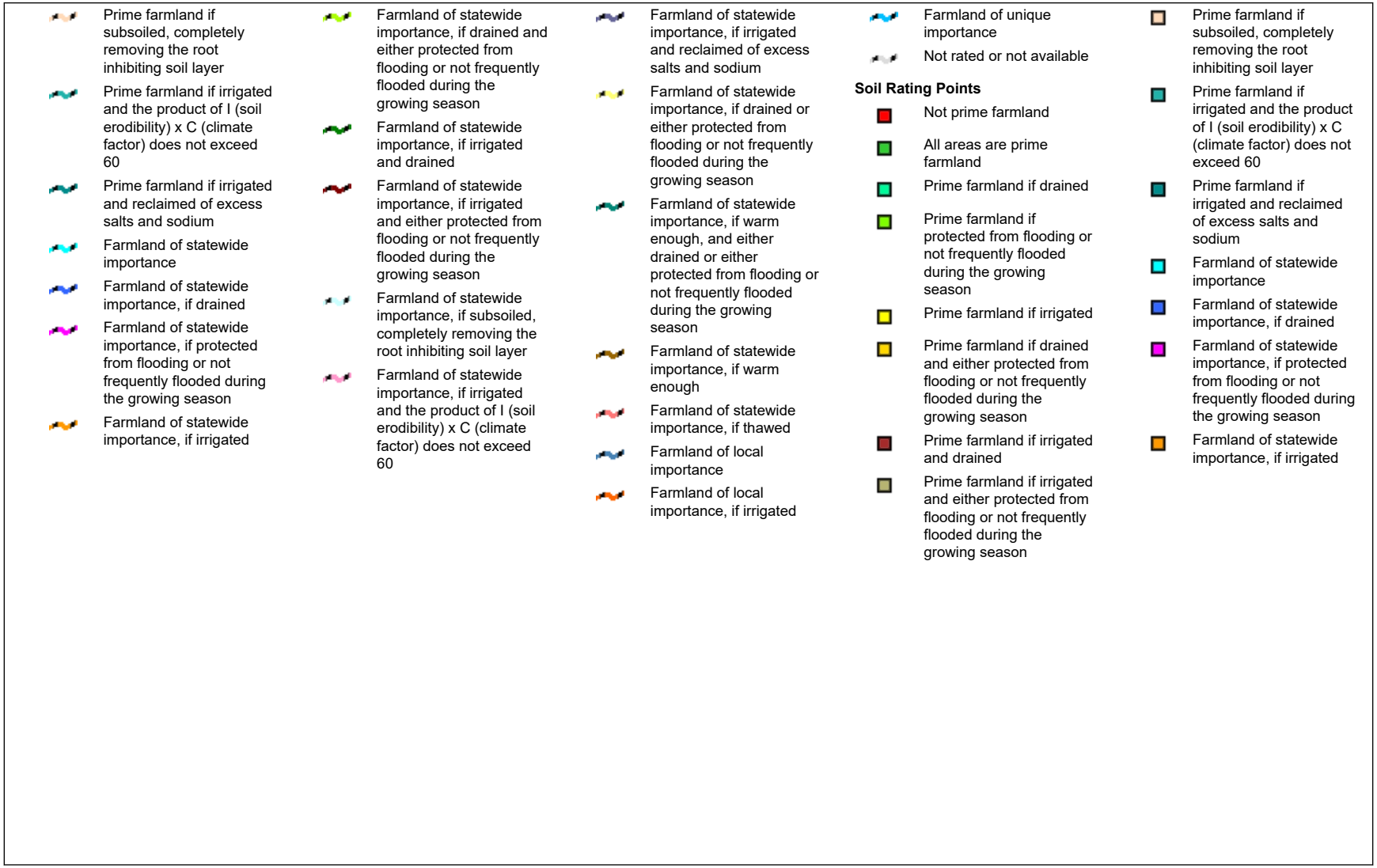
Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Custom Soil Resource Report



- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:12,000.

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: DeKalb County, Illinois
Survey Area Data: Version 18, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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.

Table—Farmland Classification (NRI 736)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	Prime farmland if drained	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	Prime farmland if drained	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	All areas are prime farmland	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	All areas are prime farmland	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	All areas are prime farmland	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	All areas are prime farmland	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	All areas are prime farmland	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	All areas are prime farmland	11.2	13.8%
Totals for Area of Interest			**80.9**	**100.0%**

Rating Options—Farmland Classification (NRI 736)

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Water Management

Water Management interpretations are tools for evaluating the potential of the soil in the application of various water management practices. Example interpretations include pond reservoir area, embankments, dikes, levees, and excavated ponds.

Surface Water Management, System (NRI 736)

The ratings for Surface Water Management, System are based on the soil properties that affect the capacity of the soil to convey surface water across the landscape. Factors affecting the system installation and performance are considered. Water conveyances include graded ditches, grassed waterways, terraces, and diversions. The ratings are for soils in their natural condition and do not consider present land use. The properties that affect the surface system performance include depth to bedrock, saturated hydraulic conductivity, depth to cemented pan, slope, flooding, ponding, large stone content, sodicity, surface water erosion, and gypsum content.

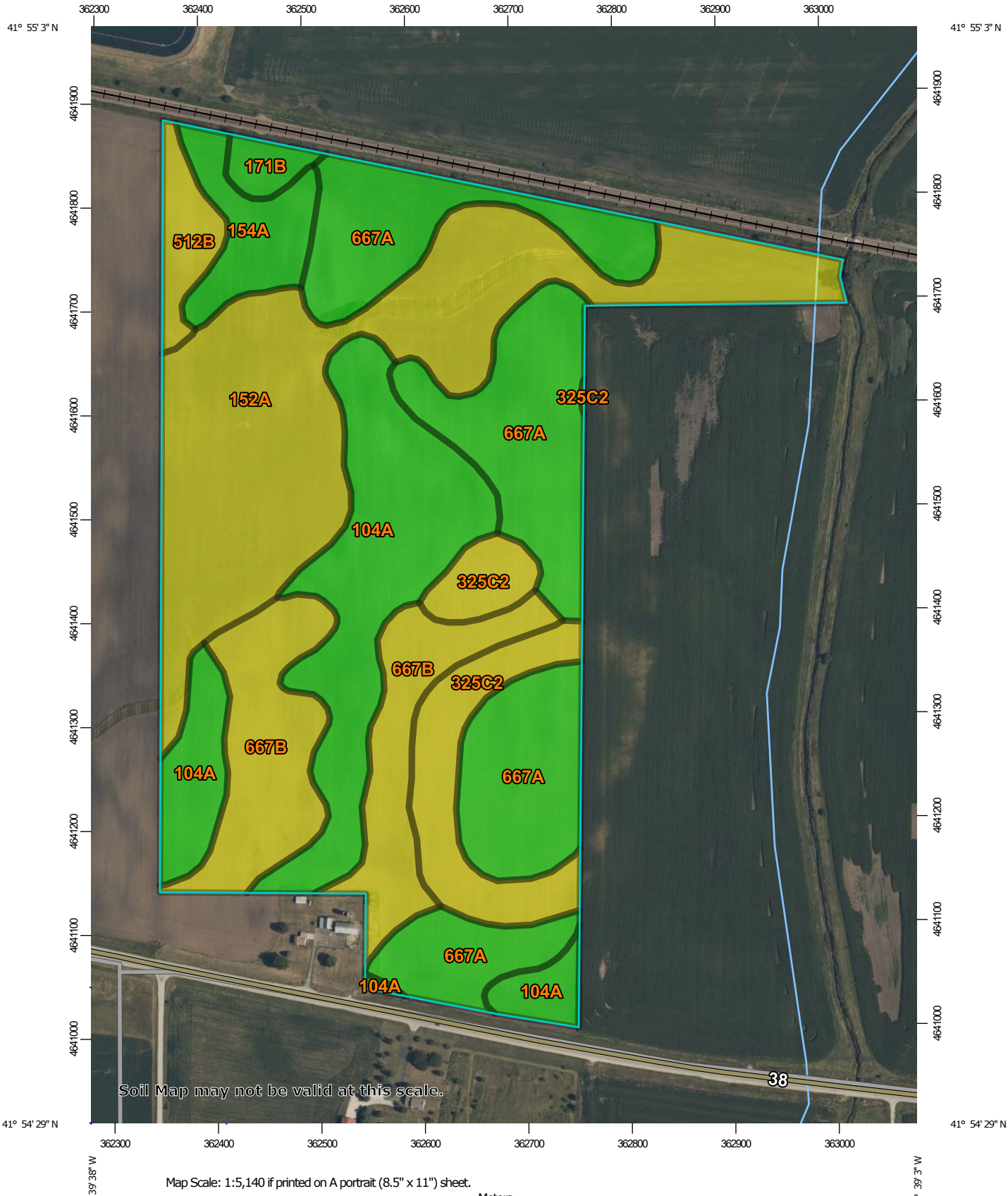
The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as that listed for the map unit. The percent composition of each component in a particular map unit is given so that the user will realize the percentage of each map unit that has the specified rating.

A map unit may have other components with different ratings. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Custom Soil Resource Report
Map—Surface Water Management, System (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points

- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

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 1:12,000.

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: DeKalb County, Illinois
Survey Area Data: Version 18, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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.

Tables—Surface Water Management, System (NRI 736)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	Not limited	Virgil (90%)		14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	Somewhat limited	Drummer, drained (94%)	Ponding (0.50)	21.3	26.3%
			Harpster, drained (3%)	Ponding (0.50)		
			Peotone, drained (3%)	Ponding (0.50)		
154A	Flanagan silt loam, 0 to 2 percent slopes	Not limited	Flanagan (95%)		3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	Not limited	Catlin (99%)		0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	Somewhat limited	Dresden, eroded (90%)	Slope (0.78)	6.5	8.0%
				Water Erosion (0.18)		
			Will (4%)	Ponding (0.50)		
512B	Danabrook silt loam, 2 to 5 percent slopes	Somewhat limited	Danabrook (92%)	Slope (0.06)	1.9	2.4%
				Water Erosion (0.01)		
			Drummer, drained (8%)	Ponding (0.50)		
667A	Kaneville silt loam, 0 to 2 percent slopes	Not limited	Kaneville (92%)		21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	Somewhat limited	Kaneville (92%)	Slope (0.06)	11.2	13.8%
				Water Erosion (0.04)		
Totals for Area of Interest					**80.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Somewhat limited	40.9	50.6%
Not limited	40.0	49.4%
Totals for Area of Interest	**80.9**	**100.0%**

Rating Options—Surface Water Management, System (NRI 736)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

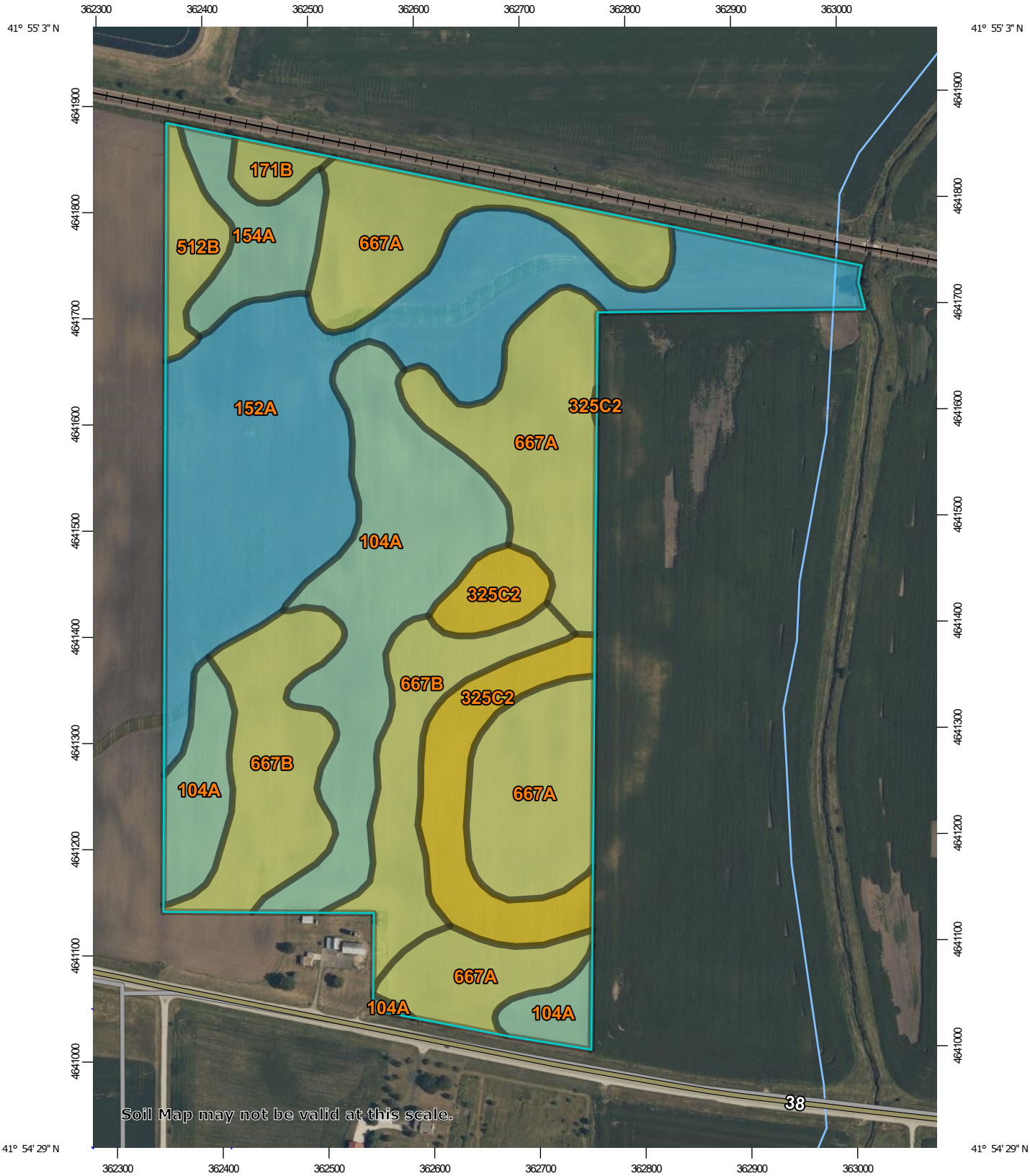
Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Drainage Class (NRI 736)

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Custom Soil Resource Report
Map—Drainage Class (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Lines

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Points

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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Warning: Soil Map may not be valid at this scale.

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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)

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Soil Survey Area: DeKalb County, Illinois
Survey Area Data: Version 18, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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Table—Drainage Class (NRI 736)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	Somewhat poorly drained	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	Poorly drained	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	Somewhat poorly drained	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	Moderately well drained	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	Well drained	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	Moderately well drained	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	Moderately well drained	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	Moderately well drained	11.2	13.8%
Totals for Area of Interest			**80.9**	**100.0%**

Rating Options—Drainage Class (NRI 736)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group (NRI 736)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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 1:12,000.

Warning: Soil Map may not be valid at this scale.

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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)

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Soil Survey Area: DeKalb County, Illinois
Survey Area Data: Version 18, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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Table—Hydrologic Soil Group (NRI 736)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	B/D	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	B/D	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	C/D	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	C	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	B	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	C	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	C	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	C	11.2	13.8%
Totals for Area of Interest			**80.9**	**100.0%**

Rating Options—Hydrologic Soil Group (NRI 736)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Water Features

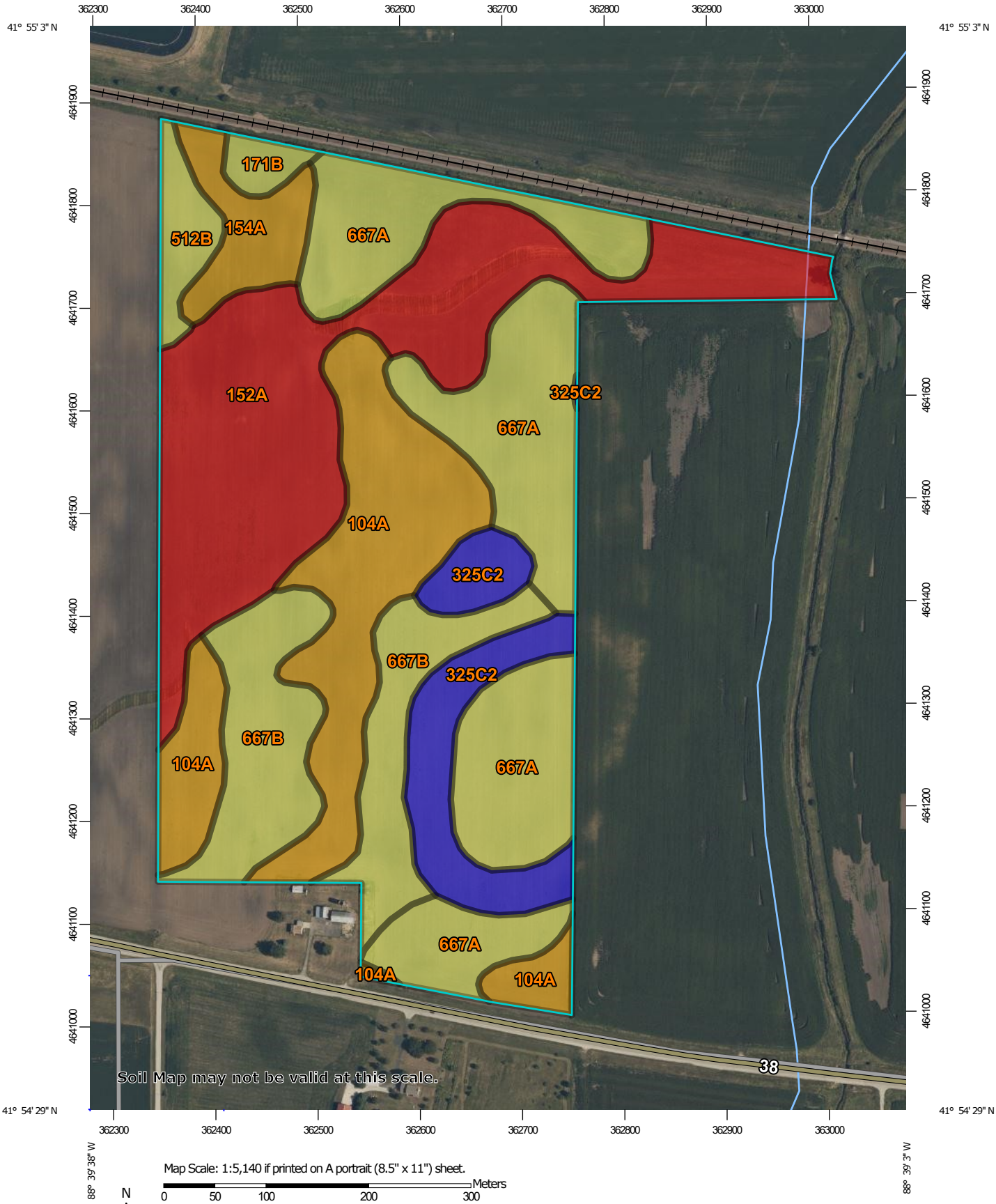
Water Features include ponding frequency, flooding frequency, and depth to water table.

Depth to Water Table (NRI 736)

"Water table" refers to a saturated zone in the soil. It occurs during specified months. Estimates of the upper limit are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Depth to Water Table (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Lines

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Soil Rating Points

- 0 - 25
- 25 - 50
- 50 - 100
- 100 - 150
- 150 - 200
- > 200
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Table—Depth to Water Table (NRI 736)

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	38	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	15	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	46	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	81	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	>200	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	84	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	84	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	84	11.2	13.8%
Totals for Area of Interest			**80.9**	**100.0%**

Rating Options—Depth to Water Table (NRI 736)

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Beginning Month: January

Ending Month: December

Flooding Frequency Class (NRI 736)

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent.

"None" means that flooding is not probable. The chance of flooding is nearly 0 percent in any year. Flooding occurs less than once in 500 years.

"Very rare" means that flooding is very unlikely but possible under extremely unusual weather conditions. The chance of flooding is less than 1 percent in any year.

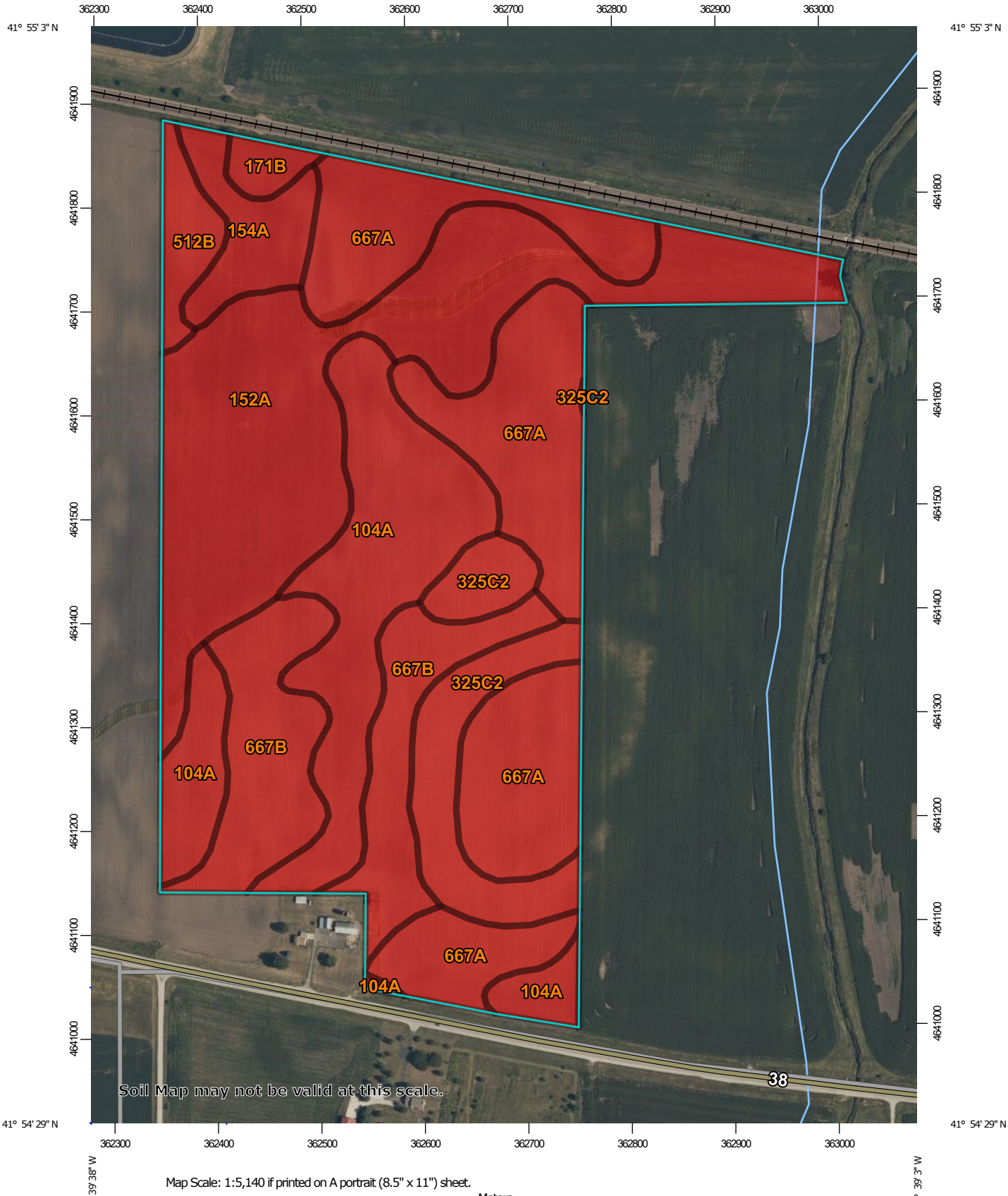
"Rare" means that flooding is unlikely but possible under unusual weather conditions. The chance of flooding is 1 to 5 percent in any year.

"Occasional" means that flooding occurs infrequently under normal weather conditions. The chance of flooding is 5 to 50 percent in any year.

"Frequent" means that flooding is likely to occur often under normal weather conditions. The chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year.

"Very frequent" means that flooding is likely to occur very often under normal weather conditions. The chance of flooding is more than 50 percent in all months of any year.

Custom Soil Resource Report
Map—Flooding Frequency Class (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- None
- Very Rare
- Rare
- Occasional
- Common
- Frequent
- Very Frequent
- Not rated or not available

Soil Rating Lines
- None
- Very Rare
- Rare
- Occasional
- Common
- Frequent
- Very Frequent
- Not rated or not available

Soil Rating Points
- None
- Very Rare
- Rare
- Occasional
- Common
- Frequent
- Very Frequent
- Not rated or not available

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 1:12,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Table—Flooding Frequency Class (NRI 736)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	None	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	None	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	None	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	None	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	None	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	None	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	None	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	None	11.2	13.8%
Totals for Area of Interest			**80.9**	**100.0%**

Rating Options—Flooding Frequency Class (NRI 736)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: More Frequent

Beginning Month: January

Ending Month: December

Ponding Frequency Class (NRI 736)

Ponding is standing water in a closed depression. The water is removed only by deep percolation, transpiration, or evaporation or by a combination of these processes. Ponding frequency classes are based on the number of times that ponding occurs over a given period. Frequency is expressed as none, rare, occasional, and frequent.

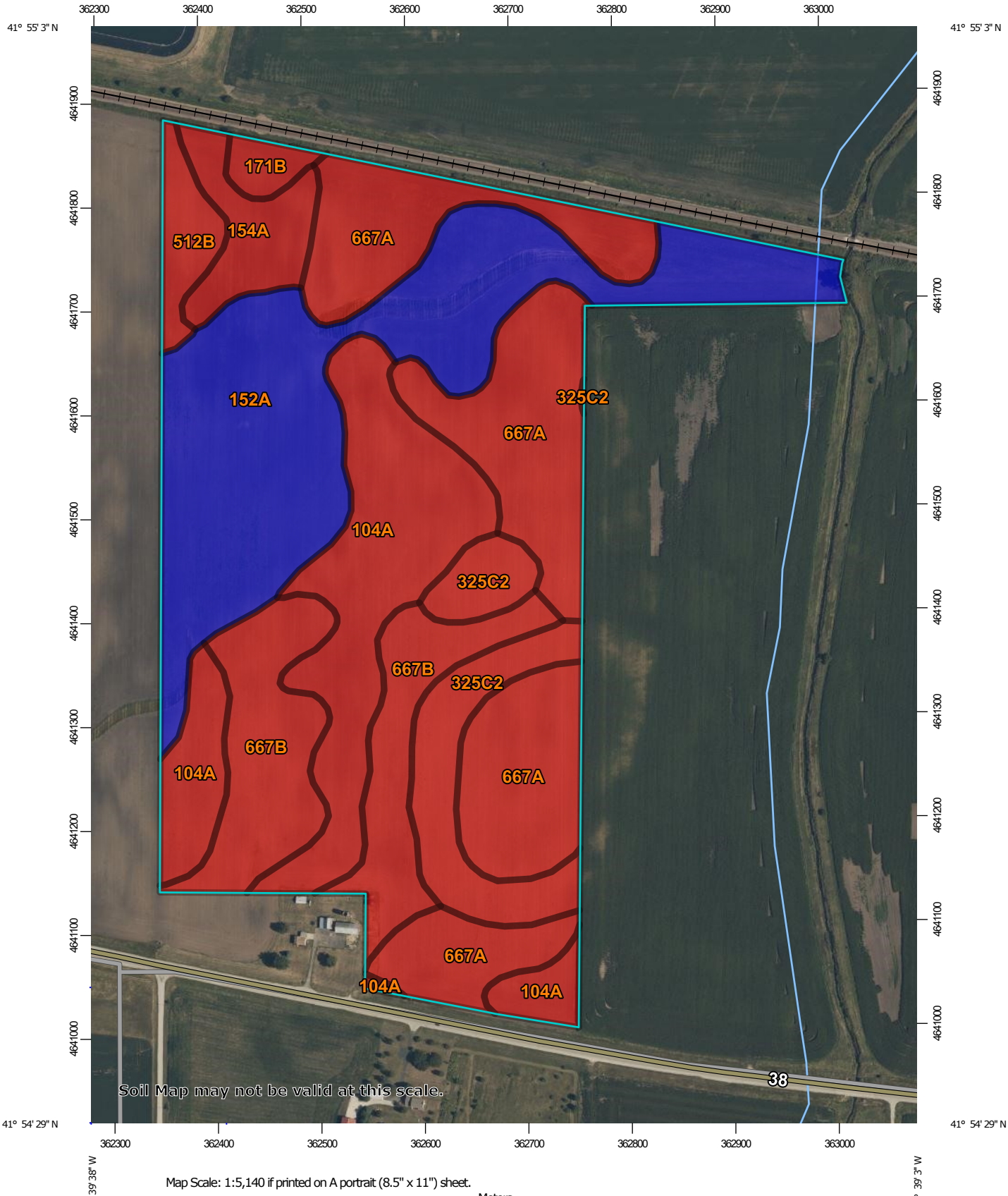
"None" means that ponding is not probable. The chance of ponding is nearly 0 percent in any year.

"Rare" means that ponding is unlikely but possible under unusual weather conditions. The chance of ponding is nearly 0 percent to 5 percent in any year.

"Occasional" means that ponding occurs, on the average, once or less in 2 years. The chance of ponding is 5 to 50 percent in any year.

"Frequent" means that ponding occurs, on the average, more than once in 2 years. The chance of ponding is more than 50 percent in any year.

Custom Soil Resource Report
Map—Ponding Frequency Class (NRI 736)



Map Scale: 1:5,140 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- None
- Rare
- Occasional
- Frequent
- Not rated or not available

Soil Rating Lines
- None
- Rare
- Occasional
- Frequent
- Not rated or not available

Soil Rating Points
- None
- Rare
- Occasional
- Frequent
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: DeKalb County, Illinois
Survey Area Data: Version 18, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 3, 2019—Aug 24, 2019

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.

Table—Ponding Frequency Class (NRI 736)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
104A	Virgil silt loam, 0 to 2 percent slopes	None	14.7	18.1%
152A	Drummer silty clay loam, 0 to 2 percent slopes	Frequent	21.3	26.3%
154A	Flanagan silt loam, 0 to 2 percent slopes	None	3.2	3.9%
171B	Catlin silt loam, 2 to 5 percent slopes	None	0.9	1.1%
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	None	6.5	8.0%
512B	Danabrook silt loam, 2 to 5 percent slopes	None	1.9	2.4%
667A	Kaneville silt loam, 0 to 2 percent slopes	None	21.2	26.2%
667B	Kaneville silt loam, 2 to 5 percent slopes	None	11.2	13.8%
Totals for Area of Interest			**80.9**	**100.0%**

Rating Options—Ponding Frequency Class (NRI 736)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: More Frequent

Beginning Month: January

Ending Month: December

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Erosion

This folder contains a collection of tabular reports that present soil erosion factors and groupings. The reports (tables) include all selected map units and components for each map unit. Soil erosion factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

RUSLE2 Related Attributes (NRI 736)

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factor Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic layer.

Report—RUSLE2 Related Attributes (NRI 736)

Soil properties and interpretations for erosion runoff calculations. The surface mineral horizon properties are displayed or the first mineral horizon below an organic surface horizon. Organic horizons are not displayed.

RUSLE2 Related Attributes–DeKalb County, Illinois

Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
104A—Virgil silt loam, 0 to 2 percent slopes								
Virgil	90	249	B/D	.37	5	5.0	74.0	21.0
152A—Drummer silty clay loam, 0 to 2 percent slopes								
Drummer, drained	94	298	B/D	.24	5	8.0	61.0	31.0

RUSLE2 Related Attributes–DeKalb County, Illinois								
Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
154A—Flanagan silt loam, 0 to 2 percent slopes								
Flanagan	95	298	C/D	.32	5	5.0	71.0	24.0
171B—Catlin silt loam, 2 to 5 percent slopes								
Catlin	99	249	C	.32	5	4.0	70.0	26.0
325C2—Dresden silt loam, 4 to 6 percent slopes, eroded								
Dresden, eroded	90	151	B	.32	3	18.0	59.5	22.5
512B—Danabrook silt loam, 2 to 5 percent slopes								
Danabrook	92	298	C	.32	5	7.0	71.0	22.0
667A—Kaneville silt loam, 0 to 2 percent slopes								
Kaneville	92	298	C	.43	5	5.0	74.0	21.0
667B—Kaneville silt loam, 2 to 5 percent slopes								
Kaneville	92	249	C	.37	5	5.0	75.0	20.0

Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

Hydrologic Soil Group and Surface Runoff (NRI 736)

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained

soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff (NRI 736)

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff–DeKalb County, Illinois			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
104A—Virgil silt loam, 0 to 2 percent slopes			
Virgil	90	—	B/D
152A—Drummer silty clay loam, 0 to 2 percent slopes			
Drummer, drained	94	Negligible	B/D
154A—Flanagan silt loam, 0 to 2 percent slopes			
Flanagan	95	Low	C/D
171B—Catlin silt loam, 2 to 5 percent slopes			
Catlin	99	Low	C
325C2—Dresden silt loam, 4 to 6 percent slopes, eroded			
Dresden, eroded	90	—	B
512B—Danabrook silt loam, 2 to 5 percent slopes			
Danabrook	92	Low	C
667A—Kaneville silt loam, 0 to 2 percent slopes			
Kaneville	92	Low	C
667B—Kaneville silt loam, 2 to 5 percent slopes			
Kaneville	92	Low	C

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United States Department of Agriculture

560-CPS-1

Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

ACCESS ROAD

CODE 560

(ft)

DEFINITION

An access road is an established route for equipment and vehicles.

PURPOSE

This practice is used to accomplish one or more of the following purposes:

- To provide a fixed route for vehicular travel for resource activities involving the management of conservation forestry operations, livestock, agriculture, wildlife habitat, and other conservation enterprises

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where access is needed from a private or public road or highway to a land use enterprise or conservation measure, or where access is needed in a planned land use area.

Access roads range from single-purpose, seasonal-use roads, designed for low speed and rough driving conditions, to all-purpose, all-weather roads. Single-purpose roads provide access to areas such as forest fire lines, forest management activities, remote recreation areas, or for maintenance of facilities.

This practice does not apply to temporary or infrequently used trails used for logging. Use NRCS Conservation Practice Standard (CPS) Forest Trails and Landings (Code 655) to meet this need. Trails and walkways used for animals, pedestrians, or off-road vehicles are addressed in NRCS CPS Trails and Walkways (Code 575).

CRITERIA

General Criteria Applicable to All Purposes

Design the access road to serve the enterprise or planned use with the expected vehicular or equipment traffic. Factors in the design include the type of vehicle or equipment and the speed, loads, soils, climate, turning radius, and other conditions under which vehicles and equipment are expected to operate.

Location

Locate the access road to serve the purpose intended, to facilitate the control and disposal of surface and subsurface water, to control or reduce erosion, and to make the best use of topographic features. Design the layout of the road to follow natural contours and slopes to minimize disturbance of drainage patterns. Locate the access road where it can be maintained and where water management problems are not created. To reduce potential pollution, position the road as far as possible from water bodies and watercourses. To the extent possible, do not impede overland flow.

NRCS reviews and periodically updates conservation practice standards. To obtain the current version of this standard, contact your Natural Resources Conservation Service State office or visit the Field Office Technical Guide online by going to the NRCS website at https://www.nrcs.usda.gov/ and type FOTG in the search field.

USDA is an equal opportunity provider, employer, and lender.

Alignment
Adapt the gradient and horizontal alignment to the intensity of use, the mode of travel, the type of equipment and load weights, and the level of development.

Grades normally should not exceed 10 percent except for short lengths. A maximum grade of 15 percent should only be exceeded if necessary for special uses such as field access roads or fire protection roads.

Width
The minimum width of the roadbed for an all-purpose road is 14 feet for one-way traffic and 20 feet for two-way traffic. The roadbed width includes a tread-width of 10 feet for one-way traffic or 16 feet for two-way traffic and 2 feet of shoulder width on each side. Increase the two-way traffic width by a minimum of 4 feet for trailer traffic. Single-purpose roads will have a minimum width of 10 feet with greater widths at curves and turnouts. Use vegetation or other measures to protect the shoulders from erosion.

Use turnouts on single lane roads where vehicles travel in both directions on a limited basis. Design the turnout to accommodate the anticipated vehicle use.

Provide a turnaround at the end of dead end roads. Size the turnaround for the anticipated vehicle type that will be using the road.

Provide parking space as needed to keep vehicles from parking on the shoulder or other undesirable locations.

Side slopes
Design all cuts and fills to have stable slopes that are a minimum of 2 horizontal to 1 vertical. For short lengths, rock areas, or very steep hillsides, steeper slopes may be permitted if soil conditions warrant and special stabilization measures are installed. Where possible, design slopes to a minimum of 4 horizontal to 1 vertical to improve establishment and maintenance of turf.

Where possible, avoid areas with geological conditions and soils that are subject to slides. When the area cannot be avoided, treat the area to prevent slides.

Drainage
The type of drainage structures used will depend on the intended use and runoff conditions. Provide a culvert, bridge, ford, or surface cross drain for water management at every natural drainageway. The capacity and design of the drainage feature must be consistent with sound engineering principles and must be adequate for the class of vehicle, road type, land use in the watershed, and intensity of use.

When a culvert or bridge is installed in a drainageway, it must have a minimum capacity that is sufficient to convey the design storm runoff without causing erosion or road overtopping. Table 1 lists minimum design storm frequencies for various road types.

Table 1: Minimum design storm frequencies

Road Intensity and Usage	Storm Frequency
Intermittent; single-purpose or farm use	2 year - 24 Hour
Frequent; farm headquarters, livestock access, isolated recreation areas	10 year - 24 Hour
High intensity; residential or public access	25 year - 24 Hour

For public access roads, design storm frequencies must also meet local standards.

Use NRCS CPSs Stream Crossing (Code 578), or Aquatic Organism Passage (Code 396) when aquatic species are present, to design stream crossings.

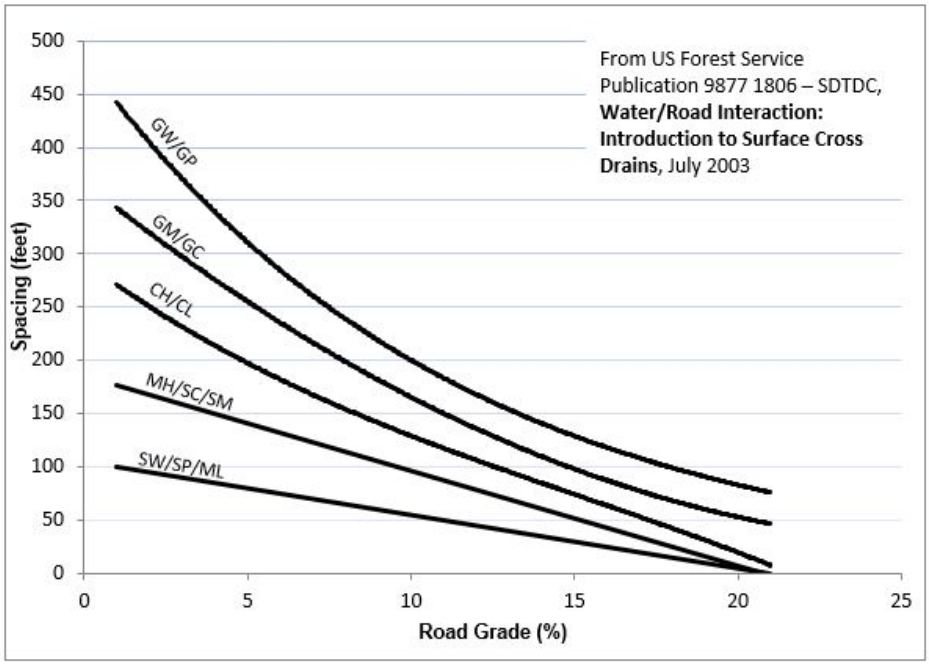
An erosion-resistant low point or overflow area may be constructed across the access road to supplement the culvert capacity on nonpublic-use roads.

Surface cross drains, such as broad-based or rolling dips, may be used to control and direct water flow off the road surface on low-intensity-use forest, ranch, or similar roads. Protect the outlets of drainage measures to limit erosion. On steep grades where water could run down the road, use a broad-based dip or other similar feature to divert runoff. The surface cross drain must be constructed of materials that are compatible with the use and maintenance of the road surface. The discharge area for a surface cross drain must be well-vegetated or have other erosion resistant materials (see fig. 1). Reduce separation distances as needed to account for local hydrologic conditions.

Design a minimum cross slope to direct precipitation off of the roadway. Cross slopes range from 1.5 to 2 percent for paved surfaces and 2 to 6 percent for unpaved surfaces.

Provide ditches, as needed, to move water away from the road. Maintain unobstructed flow into the ditches to prevent flows from causing roadside erosion. The capacity of a roadside ditch must be adequate to carry the drainage from the road surface. Design ditch channels to have stable grades and side slopes. Provide a stable outlet for the ditch. Protection may include riprap or other similar materials. Use NRCS CPSs Structure for Water Control (Code 587), Lined Waterway or Outlet (Code 468), or Grade Stabilization Structure (Code 410), if needed.

Figure 1. Recommended spacing of surface cross drains based on soil types



Surfacing

Install a wearing course or surface treatment on the access road if required by traffic needs, soil, climate, erosion control, particulate matter emission control, or other site condition. If none of these factors apply, no special treatment of the surface is required.

When a treatment is used, the type of treatment will depend on local conditions, available materials, and the existing road base. On roads made of soils with weak bearing capacity, such as silts, organics, and clays, or where it is necessary to separate the surfacing material from the foundation material, place a geotextile material specifically designed for road stabilization applications under the surface treatment. Use the criteria in NRCS CPS Heavy Use Area Protection (Code 561) to design the surface treatment. Do not use toxic and acid-forming materials to build the road.

Safety
Provide passing lanes, turnouts, guardrails, signs, and other facilities as needed for safe traffic flow. Design an intersection to a public highway to meet applicable Federal, State, and local criteria.

Erosion control
Use the criteria in NRCS CPS Critical Area Planting (Code 342) or the NRCS State-approved seeding specification to vegetate road banks and disturbed areas as soon as soil and climatic conditions are favorable. If permanent vegetation cannot be established in a timely manner, use appropriate temporary measures to control erosion. If the use of vegetation is precluded and protection against erosion is needed, use the criteria in NRCS CPS Mulching (Code 484) to provide surface protection.

During and after construction, use erosion and sediment control measures to minimize offsite damages.

CONSIDERATIONS

Consider visual resources and environmental values during planning and design of the road system.

Consider locating roads outside of the active floodplain to reduce bank erosion potential and the effects on stream hydrology.

Limiting the number of vehicles and vehicle speed will reduce the potential for generation of particulate matter and decrease safety and air quality concerns.

Consider using additional conservation practices such as NRCS CPS Windbreak/Shelterbelt Establishment (Code 380), to reduce the potential for generation and transport of particulate matter emissions.

During adverse weather, some roads may become unsafe or may be damaged by use. Consider restricting access to the road at that time.

When revegetation is needed, consider revegetating using species or diverse mixes that are native or adapted to the site and have multiple benefits. In addition, where appropriate, consider a diverse mixture of forbs and wildflowers to support pollinator and other wildlife habitat.

Consideration should be given to—

- Effects on downstream flows, wetlands, or aquifers that would affect other water uses or users.
- Effects on wildlife habitats that would be associated with the practice.
- Utilizing buffers where possible to protect surface water.
- Short-term and construction-related effects of this practice.

PLANS AND SPECIFICATIONS

Provide plans and specifications that describe the requirements for applying the practice to achieve its intended purpose. As a minimum, include—

- A plan view of the proposed road that shows water features, known utilities, and other features that affect the design.
- Road width and length with profile and typical cross section(s) including turnouts, parking, and turnarounds.
- Design road grades or maximum grades when applicable.
- Soils investigation. Include location of soil borings and plot of the soil/geologic boring showing the Unified Soil Classification System, as needed.
- Type and thickness of surface treatment including any subbase preparation.
- Grading plan.

- Cut and fill slopes where applicable.
- Planned drainage features.
- Location, size, type, length, and invert elevations of all required water control structures.
- Vegetative requirements that include vegetation materials to be used, establishment rates, and season of planting.
- Erosion and sediment control measures, as needed.
- Safety features.
- Construction and material specifications.

OPERATION AND MAINTENANCE

Prepare a written operation and maintenance plan for the access road. As a minimum, include the following activities:

- Inspect culverts, roadside ditches, water bars, and outlets after each major runoff event and restore flow capacity as needed. Ensure proper cross section is available and outlets are stable.
- Maintain vegetated areas in adequate cover to meet the intended purpose(s).
- Fill low areas in travel treads and regrade, as needed, to maintain road cross section. Repair or replace surfacing materials as needed.
- Selection of chemical treatment(s) for surface treatment or snow/ice removal, as needed. Select the chemicals used for surface treatment or snow and ice removal to minimize adverse effects on stabilizing vegetation.
- Selection of dust control measures, as needed.

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Request #2 – Special Use Permit

Memorandum

To: **Brandy Williams, Town of Cortland Zoning Administrator**

From: **Eric Zweber, AICP, WSB**
Lauren Zion, WSB

Date: **October 22, 2025**

Re: **Cortland Solar Garden Special Use Permit Application**
PINs: 0927300004; 0927100002
WSB Project No. 024543-000

Cortland Illinois Dynamics 1 LLC and Cortland Illinois Dynamics 2 LLC ("Cortland Solar" and "The Applicant") is pleased to present the necessary applications for two community solar photovoltaic (PV) projects in DeKalb County, Illinois. The proposed projects require the following Town approvals:

- **Annexation Approval –** An annexation must be approved by the Town of Cortland prior to any decision on a Special Use Permit.
- **Special Use Permit -** A Special Use Permit is requested, as a solar garden is listed as a Special Use in the AG, agricultural district.

The annexation approval is addressed separately in the preceding files of this packet. This memorandum addresses requirements for the Special Use Permit Approval.

Overview and Project Description

Cortland Solar is developing community solar projects in conjunction with the State of Illinois Future Energy Jobs Act (FEJA). Through this Act, the State established the Community Solar Program allowing developers to develop, permit, own, and operate solar projects with the ability to sell solar electricity directly to customers. The solar facilities connect to the ComEd distribution grid. ComEd delivers the power to customers and Cortland Solar bills the customer for the electricity they purchase.

Cortland Solar is proposing to develop a 5-megawatt AC solar project (Cortland 1) and a 2-megawatt AC solar project (Cortland 2) on property in DeKalb County **(Appendix A)**. The proposed solar sites are proposed to be annexed into the Town of Cortland as AG district property. The proposed solar sites are located in the northeast corner of the

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intersection of Lincoln Highway (State Route 38) and Chase Road. The site is located in Section 27, Township 40 North, Range 5 East in DeKalb County, Illinois.

The total area of the affected property is 80.3 acres. A portion of the property is proposed to be developed from agricultural cropland use into two solar sites. The proposed solar panel area is 29.9 acres, and the estimated disturbed area is 37.5 acres **(Appendix A)**. The remaining area (approximately 12.9 acres) will remain as agricultural cropland. After the solar panels are in place, the disturbed area will be reseeded with a short growth pollinator friendly seed mix **(Appendix A).**

The phasing plan for this project is to obtain the required jurisdictional and regulatory approvals for the solar projects to commence with a shovel ready project by July 4, 2026. Our objective would be to have the solar facilities commercially operational by December 31, 2028. We will complete the necessary requirements for the building permit application and approval after state selections have been made.

The site is suitable for a second phase of development consisting of an additional solar area, where it is located north of the proposed area identified in the site plan. The proposed development and associated improvements are all identified in the site plan.

Zoning and Performance Standards

The property is proposed for annexation into the AG, agricultural district. Solar Gardens are listed as a Special Use in the AG district. The performance standards for a Solar Garden are listed in section 9-4-34. B. of the Cortland Illinois Zoning Ordinance:

1. Bulk regulations:
    a. Minimum Lot Area: Five (5) Acres.
    b. Front and Corner Side Yard: Fifty feet (50').
    c. Side Yard: Fifty feet (50').
    d. Rear Yard: Fifty feet (50').
    e. Height: Ground or pole mounted solar energy system shall not exceed ten feet (10') in height as measured when the system is oriented at its maximum tilt. All other equipment shall not exceed fifteen feet (15') in height.

    The parcels involved are approximately 62 acres and 19 acres, respectively. All equipment, including fences are located over 50' from any property line. The smallest proposed distance from fence to property line is 50'. When at full tilt, the system height will not exceed 10' in height. ***(Appendix A)****.*

2. Off-Street Parking: There shall be a minimum of two (2) parking spaces with minimum dimensions of ten by twenty feet (10' x 20'). Accessways shall be a minimum of twelve feet (12') wide. Parking spaces and accessways located on

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private property do not have to be paved but do need to have a minimum of a seven inch (7") compacted stone base. Accessways located within the right-of-way shall meet standards set by the town engineer.

*Two off-street parking spaces with a minimum of a 7" compacted stone base will be provided on site **(Appendix A)**. The access driveway will be 18' wide, pursuant to approval by IDOT.*

3. Signage: An identification sign shall be posted at the entrance(s) to the site. Each such identification sign shall list the name and phone number of the operator. In addition to the identification sign(s) there shall be appropriate warning signage that is posted along all property lines which are clearly visible on the site. Both the identification sign(s) and the warning sign(s) are exempt from section 9-6 of the Municipal Code.

   Warning signs will be posted on the sites, in locations to be identified prior to building permit application. Warning signs will comply with relevant safety signage standards.

4. Power and Communication Lines: Power and communication lines running between banks of solar panels and to electric substations or interconnections with buildings shall be buried underground.

   *Utility lines will be placed underground as feasible up to the point of interconnection along State Route 38. The point of interconnection will require 14 aboveground utility poles. Six will be owned by Cortland Solar and located within the fenced area near the provided parking spaces. Eight will be owned by ComEd and located near the point of interconnection at State Route 38 **(Appendix A)**. Lines between these four sets of poles will be placed underground.*

5. Batteries: If the solar farm or solar garden consists of batteries or storage of batteries, adequate design must be provided to ensure all local, state and federal requirements regulating outdoor battery storage have been met.

   No battery storage is included in either proposed solar garden facility.

6. Interconnection: An interconnection agreement must be completed with the electric utility in whose service territory the system is located.

   *All interconnection studies have been completed, and we expect to sign the Generator Interconnection Agreement by December, 2025 **(Appendix B).***

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7. Stormwater and NPDES: Solar farms and solar gardens are subject to the town's stormwater management and erosion and sediment control provisions and NPDES permit requirements.

   All site development will comply with the Town of Cortland's stormwater management and sediment control provisions. A NPDES permit will be received as needed, prior to construction. A site development permit from the Town will be required prior to construction. A stormwater management analysis is provided in ***Appendix C****. The proposed conditions would result in a net reduction in peak flow rates and runoff volumes, due to the best management practice (BMP) of a low-growth pollinator grass seed mix. Final Stormwater BMPs will be provided at time of building permit submittal. As required in the AIMA* ***(Appendix D),*** *the Applicant is responsible for repairing any impacts to drainage tiles on site. The landowner has confirmed there is drainage tile on site through the grass waterways and in other locations. To avoid and mitigate impact, a drainage tile survey will be completed and submitted prior to building permit issuance.*

8. Ground Cover and Buffer Areas: The site of a ground mounted solar farm or solar garden energy system shall be improved and maintained with a native perennial vegetative ground cover over the entire property including under and around solar panels. The purpose of this ground cover shall be the prevention of soil erosion and the management of stormwater run-off. Topsoil shall not be removed during development, unless part of a remediation effort.

   The area around and underneath the solar panels will be planted with a native low-growth pollinator grass mix, in compliance with IDNR standards ***(Appendix A)****. Any necessary changes to existing grade will be identified before building permit application. As required per the ordinance and the AIMA, topsoil will not be removed from site during the development unless it's part of a remediation effort.*

9. Foundation: A qualified engineer shall certify that the foundation and design of the solar panels racking and support is within accepted professional standards, given local soil and climate conditions.

   A geotechnical analysis of the site will be conducted following zoning approval and prior to building permit application. The geotechnical report will inform the appropriate mounting hardware, foundations, and installation methods for tracker poles given local soil, subsurface, and climate conditions.

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10. Other Standards and Codes: All solar farms and solar gardens shall be in compliance with all applicable local, state and federal regulatory codes.

    The proposed solar gardens will comply with all applicable regulations including but not limited to ANSI safety regulations, IPCB noise regulations, National Electric Code, and Building Code.

11. Site Plan Required: A detailed site plan for both existing and proposed conditions must be submitted, showing location of all solar arrays, other structures, property lines, rights-of-way, easements, service roads, floodplains, wetlands and other protected natural resources, topography, electric equipment, and all other characteristics requested by the Town.

    *A site plan is attached in **Appendix A**.*

12. FAA Compliance: Solar farms and solar gardens that are located within five hundred feet (500') of an airport or within approach zones of an airport, are required to complete and provide the results of the Solar Glare Hazard Analysis Tool (SGHAT) for the Airport Traffic Control Tower cab and final approach paths, consistent with the Interim Policy, FAA Review of Solar Energy Projects on Federally Obligated Airports, or most recent version adopted by the FAA.

    *Based on the FAA Notice Criteria tool, the proposed structures on the site do not require FAA noticing or approval **(Appendix E)**. The nearest airport is the DeKalb Taylor Municipal Airport, located approximately 2.5 miles from the site area.*

13. Endangered Species and Wetlands: Solar farm and solar garden developers shall be required to initiate a natural resource review consultation with the Illinois Department of Natural Resources (IDNR) through the department's online, EcoCat program. Areas reviewed through this process will be endangered species and wetlands. The cost of the EcoCat consultation will be borne by the developer. Results of this consultation will be included in the special use application packet.

    *Consultation was concluded with IDNR EcoCAT. Results are included in **Appendix E, attachment C.** The USFWS Information for Planning and Consultation tool results are also included in **Appendix E, attachment D**.*

14. Upon request from the town, the owner or operator of a solar farm or solar garden must submit, within fourteen (14) calendar days, a current operation and maintenance report to the town.

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Upon request, current operation and maintenance reports will be provided to the Town.

15. Decommissioning:
    a. A decommissioning plan shall be required to be submitted when applying for all solar farms and solar gardens, to ensure that facilities are properly removed after their useful life.
    b. Decommissioning of solar panels must occur in the event they are not in use for ninety (90) consecutive days.
    c. The owner or operator will have six (6) months to complete the decommissioning plan after operation of a solar farm or solar garden stops being operational.
    d. The decommissioning plan shall include provisions for removal of all structures and foundations, restoration of soil and vegetation and a plan ensuring financial resources will be available to fully decommission the site.
    e. The town board of trustees may require the posting of a bond, letter of credit, or the establishment of an escrow account to ensure the proper decommissioning. The posting of financial surety may be required prior to the issuance of a building permit for the facility. Said surety shall remained updated and valid until the solar farm/solar garden has been completely decommissioned in accordance with the latest approved decommissioning plan and restored in compliance with section 9-4-34.B.15. As outlined in the chapter establishing the special use permit, the amount of surety shall be periodically reviewed by staff and the surety amount adjusted accordingly.
    f. In the event that the State of Illinois enacts a law with regards to the decommissioning of a solar farm or solar garden, the strictest requirements shall prevail.
    g. The owner of a solar energy facility shall submit an update to this decommissioning plan every three (3) to five (5) years following issuance of the special use.

*The Applicant will follow all state and town regulations related to facility decommissioning. A decommissioning plan and cost estimate has been provided in **Appendix F**. The AIMA contains standard provisions on decommissioning and restoration including removal of all solar related equipment after the useful life of the facility and filing of necessary financial assurances during operation **(Appendix D).** In addition, decommissioning will be completed within six months as required by the town ordinance and will follow requirements of the Cortland Ordinance.*

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16. Restoration Requirements: The owner of a solar farm or solar garden shall provide the zoning administrator with a written notice of termination of operations or abandonment of the solar energy facility. Within one hundred twenty (120) consecutive calendar days immediately following the town's receipt of such written notice or within one hundred twenty (120) consecutive calendar days immediately following the termination of such special use, whichever first occurs, the owner of each such solar farm or solar garden shall:
    a. Remove all structures, buildings, solar panels, above ground improvements, outdoor storage, fencing, equipment, and roadways; and
    b. Completely remove all foundations, pads, and underground electrical wires; and
    c. Remove all hazardous material from the property and dispose of the hazardous material in accordance with all applicable federal, Illinois, and Town laws, statues, ordinances, rules, and regulations; and
    d. Restoration of all soil and vegetation.

    The owner will provide written notice when the facility reaches the end of its operational life. A decommissioning plan and cost estimate has been provided in ***Appendix F****. The site decommissioning will be completed within six months, as required by the Cortland Ordinance.*

17. Bonds: Prior to the issuance of a building permit, the owner of a solar energy facility shall provide the town with a performance and payment bond with adequate security or surety bond in an amount determined adequate by the town board to guarantee the performance of the aforesaid restoration requirements and decommissioning plan.

    Prior to issuance of a building permit, the Applicant will provide the Town with a financial surety as required, consistent with the decommissioning costs as identified in the decommissioning plan ***(Appendix F)****.*

18. Abandonment: A decommission plan shall be approved by the town board during the special use permit process. At the time of building permit, a letter of credit, or other financial surety instrument approved by the town attorney, in the amount of the estimated cost of decommission, as approved by the town engineer, shall be submitted to the town. If the solar farm or solar garden is abandoned and not properly decommissioned, the town shall utilize the funds to restore the property to its original or an improved condition.

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*Prior to issuance of a building permit, the Applicant will provide the Town with a financial surety as required, to guarantee the performance of decommissioning as identified in the decommissioning plan **(Appendix F)**.*

Special Use Permit Standards

The proposed solar projects will provide public benefit by producing renewable energy to improve quality of life. The projects will generate no greenhouse gas emissions during operation, avoiding some greenhouse gas emissions that would have otherwise been created during conventional electricity production for residents in the area. The proposed use will not have a substantial adverse effect on the neighborhood or adjacent property. The projects will not unduly increase traffic congestion (see "project parameters" below), nor will it be detrimental to public health, safety, or general welfare. Adequate public utilities, access roads, and drainage have been provided. The projects will not increase flood danger and will reduce runoff volumes **(Appendix C)**. The projects will not limit existing or future development of neighboring property.

Site Appearance

The existing land use within the property is approximately 80.3 acres of cultivated cropland per the USGS NLCD. Primarily agricultural cropland and sparse rural residential uses encompass the areas surrounding the site. The municipal water treatment plant is located to the NW of the site. The proposed land use will include approximately 29.9 acres of solar panels and corresponding equipment within the fenced area. The area around and underneath the solar panels will be planted with native low-growth pollinator grass mixes.

One (1) access driveway off State Route 38 is proposed to provide an approach to the solar arrays for light duty service vehicles for maintenance and equipment purposes. The access road will be 18 feet in width. An 8-foot high chain link security fence will be constructed around the perimeter of the solar arrays. In addition, to be consistent with IDNR recommendations, we propose a 6" animal migration space at the bottom of the fence. Rows of panels are separated by lanes 14 to 25 feet wide.

The solar arrays will consist of one 5-megawatt AC solar facility and one 2-megawatt AC solar facility in which the total solar panel area is 29.9 acres and the estimated disturbed area is 37.5 acres **(Appendix A)**. The final layout of the arrays will be subject to construction and electrical engineering and ComEd's final interconnection approval. The ground-mounted solar array for Cortland 1 will consist of 10,500 bifacial 620-Watt modules and 105 single axis solar tracker systems that will connect to 150 kW smart inverters, while Cortland 2 will consist of 4,600 bifacial 620-Watt modules and 48 single axis solar tracker systems that will connect to 150 kW smart inverters. Smart inverters are then connected to a meter which measures the amount of electrical energy produced. The electrical energy will then be distributed directly to the public utility grid

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via a point of interconnection (POI) along State Route 38. The POI will require 14 aboveground utility poles. Six will be owned by Cortland Solar (which are located near the fence line for each array), and eight will be owned by ComEd (that will located near and within the IL Route 38 ROW) . There will be a total of 153 single axis trackers on site **(Appendix A).** There will be 48 inverters on site, and the project will require approximately 1,508 posts supporting the tracker systems and solar modules.

The angle of the solar arrays will change throughout the day as panels “track” the Sun. These trackers provide a lower view shed of the solar panels (maximum height 10 feet) with the added benefit of further reducing glare. The maximum tilt that a panel will reach is 36%. Solar array quantities and manufacturer information is provided in **Appendix A**. All photovoltaic systems will comply with the Illinois State Electric Code and National Electric Code.

Project Parameters

The maximum number of occupants on the site at one time will be 2 people. The maximum number of occupants on-site per day during construction will be approximately 25 people. The maximum number of employees on site per day during operation is approximately 2 employees periodically during any given month.

Vehicles accessing the site for maintenance will include light duty service vehicles for maintenance and equipment purposes. The maximum number of vehicles per day during construction will be approximately 30 vehicles. The maximum number of vehicles per day during operation will be approximately 2 vehicles periodically during any given month. Two parking spaces are proposed on site, as required by the ordinance. There are no existing or proposed public restrooms or floor drains on the site.

Hydrological Features

The FEMA FIRM maps for DeKalb County, Illinois identify that the site includes a minor portion (approximately 0.5 acres) of the 100-year floodplain **(Appendix C, figure 3A).** A stormwater management analysis of the site was conducted and provided in **Appendix C**. The analysis concludes that the proposed development and establishment of short growth pollinator mix will result in lower peak flow rates and lower runoff volumes from the project site than currently exist.

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) *Web Soil Survey* defines Hydrologic Soil Groups (HSG) on the property. HSG D, defined as having high runoff potential when thoroughly wet, is the predominant soil type on approximately 37.6 acres **(Appendix C, figure 4).** HSG C, defined as having moderately high runoff potential when thoroughly wet, covers an additional 36.3 acres while HSG B, defined as having moderately low runoff potential when wet, is the predominant soil type on the remaining 6.4 acres of the site.

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Topography within the project area ranges from 852 feet above mean sea level (AMSL) in the northeastern corner of the project area to 868 ft AMSL in the southeastern portion of the project area. Topographic relief is moderate, with an elevation difference of approximately 16 feet across the project area **(Appendix E, figure 3).** Erosion control best management practices and a Stormwater Pollution Prevention Plan (SWPPP) will be submitted prior to application for a building permit.

Wetlands

The U.S. Fish and Wildlife Service (USFWS) *National Wetlands Inventory* (NWI) indicates that a riverine wetland is mapped within the project area **(Appendix E, figure 8).** A level I desktop wetland delineation identified three potential wetlands within the project area **(Appendix G).** A level II wetland delineation determined approximately 0.04 acres of wetland is located just outside of the northeastern edge of the proposed fence line **(Appendix H)**. The proposed site design avoids impacts to the onsite wetland identified by the level II analysis. Impacts are avoided by maintaining a 50 feet distance from all potential wetland areas to the security fence.

Critical Issue Analysis

A critical issue analysis was conducted for the site and is provided in **Appendix E**. The IDNR EcoCAT indicated that there are no records of state listed species, dedicated Illinois Nature Preserves, or Illinois Natural Area Inventory (INAI) sites within the project area or within in the project vicinity. The EcoCAT results and consultation termination letter and USFWS consultation report are included as **Appendix E, *Attachments B - C***. The proposed development will comply with all applicable avoidance, mitigation, or permitting requirements identified by USFWS.

The farmland ratings within the disturbance area include *Prime Farmland* and *Prime Farmland if drained.* The primary soil in the disturbance area is *Prime Farmland.* The soils classification map is included in **Appendix E, figure 7.** Detailed soils information is also included in **Appendix E, table 3.**

Plan for Right-of-Way Use

During construction, equipment and construction materials will be delivered to the site on large trucks. The delivery route will utilize State Route 38 and enter via an access driveway on the north side of the route. All necessary IDOT permits and agreements will be filed prior to construction. Comments from IDOT regarding access driveway location feasibility were received on April 30, 2024 **(Appendix I)**. IDOT noted that the proposed access driveway location is feasible.

Potential to Affect the Environment and Public Health

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Minimal impacts to public health and the environment are anticipated at the site during construction or during the 30-year operation of the facilities. The generation of electricity from photovoltaic (PV) solar panels is researched to be safe and effective. According to the U.S. Department of Energy, few power-generating technologies have as little environmental impact as PV solar panels. There are no anticipated negative effects on public health from the installation and maintenance of these solar arrays. Unlike conventional fossil fuel power generation (such as coal, gas, and oil), generating electricity with ground-mounted solar arrays uses no water, and produces no direct emissions or contaminants.

Conclusion

The Applicant is seeking a Special Use Permit to operate a 5-megawatt AC Community Solar project and a 2-megawatt AC Community Solar project on two parcels totaling 80.3 acres in the Town of Cortland. Solar installation is a clean, efficient means of power production with few moving parts and minimal maintenance that creates no noise, dust, runoff, or nuisance factors associated with other forms of power production.

We appreciate your consideration of the requested Solar Garden Special Use Permit. If you have questions or need additional information, please feel free to call Conner Sayles at 425-293-1111 or Brendan Cohen at 651-336-4640.

cc. Conner Sayles and Brendan Cohen, Cortland Solar

Appendix A: Site Plan
Appendix B: Interconnection Statuses
Appendix C: Stormwater Management Analysis
- Figure 1: Project Location
- Figure 2: Property Details
- Figure 3A: FEMA Floodplain Map
- Figure 3B: Existing Conditions Drainage Area Map
- Figure 4: Hydrologic Soils Map
- Figure 5: Land Cover Map
- Figure 6: Proposed Site Plan

Appendix D: AIMA
Appendix E: Critical Issues Analysis
- Figure 1: Project Location (Street)
- Figure 2: Project Location (Aerial)
- Figure 3: Topography
- Figure 4: Land Cover (NLCD)
- Figure 5: Karst Features
- Figure 6: Soils – Hydric Rating

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Figure 7: Soils – Farmland Classification
Figure 8: Surficial Hydrological Resources
Figure 9: Rusty Patched Bumble Bee Potential Zone
Attachment A: FAA Notice Criteria Tool Results
Attachment B: National Pipeline Mapping System Results
Attachment C: Illinois DNR EcoCAT
Attachment D: USFWS Consultation Report
Appendix F: Decommissioning Plan
Appendix G: Offsite Wetland Hydrology Assessment (Level I Wetland Delineation)
Appendix H: Onsite Wetland Delineation Report (Level II Wetland Delineation)
Appendix I: IDOT Access Driveway Feasibility Response

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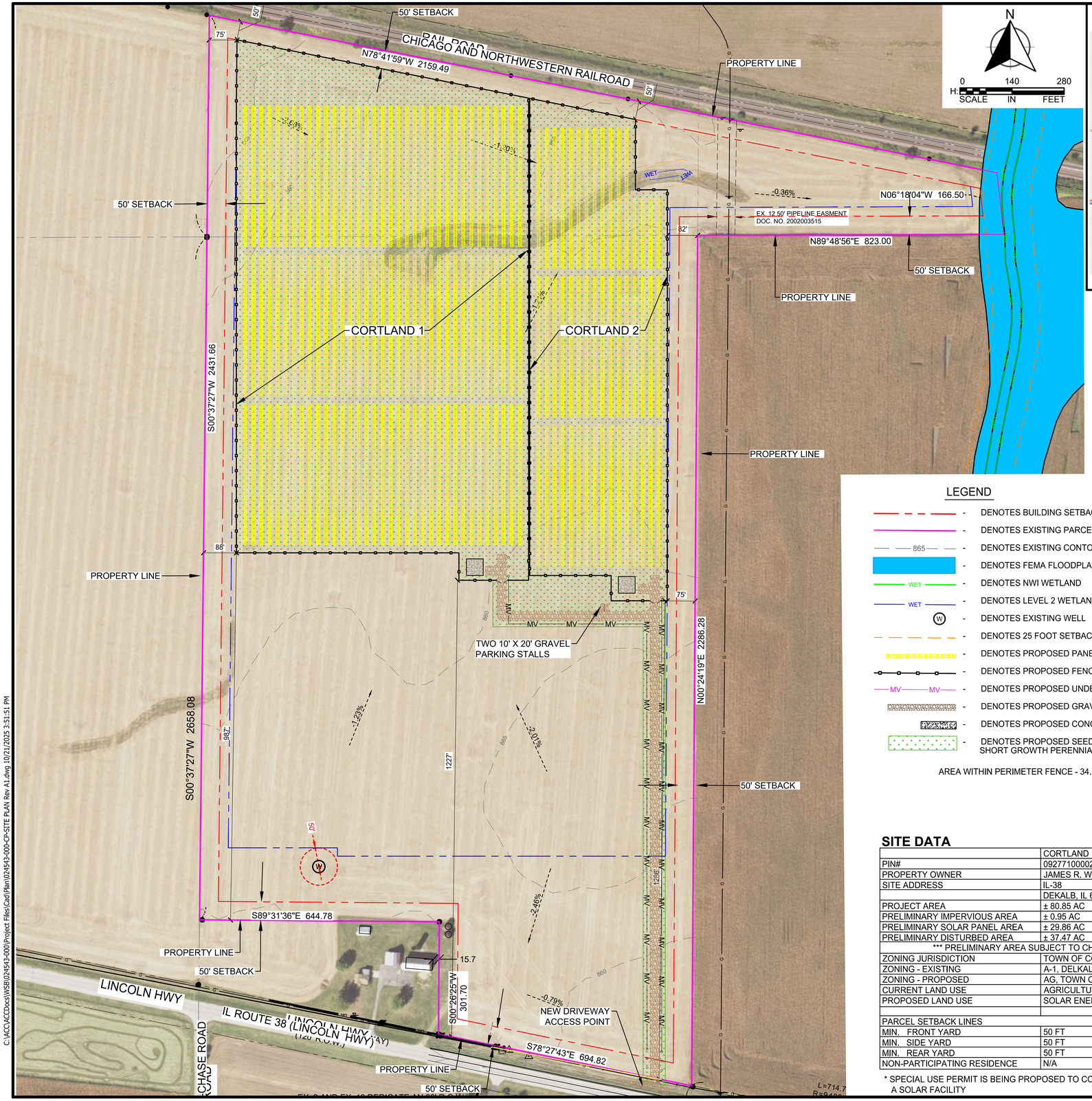
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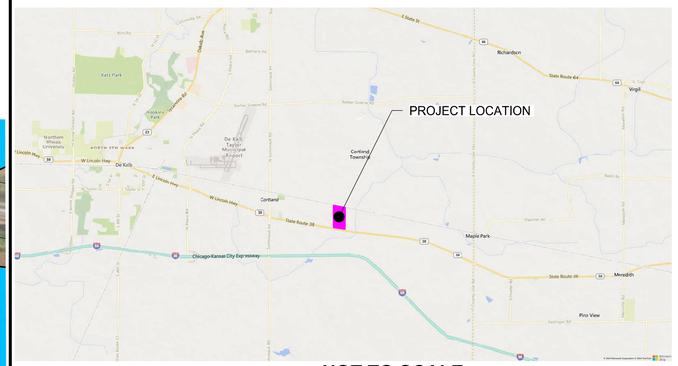
Figure 6: Soils – Hydric Rating
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Appendix A: Site Plan



LOCATION



NOT TO SCALE

LEGEND

- DENOTES BUILDING SETBACK LINE
- DENOTES EXISTING PARCEL LINE
- 865 - DENOTES EXISTING CONTOUR
- DENOTES FEMA FLOODPLAIN
- WET - DENOTES NWI WETLAND
- WET - DENOTES LEVEL 2 WETLAND LINE
- W - DENOTES EXISTING WELL
- DENOTES 25 FOOT SETBACK LINE
- DENOTES PROPOSED PANELS
- DENOTES PROPOSED FENCE
- MV MV - DENOTES PROPOSED UNDERGROUND MV FEEDER
- DENOTES PROPOSED GRAVEL ACCESS ROAD
- DENOTES PROPOSED CONCRETE
- DENOTES PROPOSED SEEDED AREA SHORT GROWTH PERENNIAL POLLINATORS

AREA WITHIN PERIMETER FENCE - 34.30 ACRES

SITE DATA

	CORTLAND 1 AND 2
PIN#	09277100002 &0927300004
PROPERTY OWNER	JAMES R. WALTER & JAMES E. WALTER
SITE ADDRESS	IL-38
	DEKALB, IL 60115
PROJECT AREA	± 80.85 AC
PRELIMINARY IMPERVIOUS AREA	± 0.95 AC
PRELIMINARY SOLAR PANEL AREA	± 29.86 AC
PRELIMINARY DISTURBED AREA	± 37.47 AC
*** PRELIMINARY AREA SUBJECT TO CHANGE ***	
ZONING JURISDICTION	TOWN OF CORTLAND
ZONING - EXISTING	A-1, DELKALB COUNTY
ZONING - PROPOSED	AG, TOWN OF CORTLAND
CURRENT LAND USE	AGRICULTURE
PROPOSED LAND USE	SOLAR ENERGY SYSTEM
PARCEL SETBACK LINES	
MIN. FRONT YARD	50 FT
MIN. SIDE YARD	50 FT
MIN. REAR YARD	50 FT
NON-PARTICIPATING RESIDENCE	N/A

* SPECIAL USE PERMIT IS BEING PROPOSED TO CONSTRUCT / OPERATE A SOLAR FACILITY

ELECTRICAL DESIGN INFORMATION - CORTLAND 1	
PV MODULE BRAND	**CANADIANSOLAR**
PV MODULE MODEL	CS6.2-66TB-620
PV MODULE TYPE	BIFACIAL
INVERTER BRAND	SMA
INVERTER	SUNNY HIGH POWER PEAK3 150-US
GCR%	36%
RACKING	ATI
TOTAL # OF MODULES	10500
TOTAL # OF STRINGS	420
MODULES PER STRING	25
TOTAL # OF TRACKERS	105
TOTAL # OF INVERTERS	34
DC SYSTEM SIZE (MW)	6.510
AC SYSTEM SIZE (MW)	5.007
DC/AC RATIO	1.30
ROW SPACING	13.89'
ACCESS ROAD WIDTH	18'
MAX & MIN TEMP	35°C & -26°C
SNOW LOAD & WIND SPEED(RISK CATEGORY III)	25 LB/SQFT & 120 MPH

ELECTRICAL DESIGN INFORMATION - CORTLAND 2	
PV MODULE BRAND	**CANADIANSOLAR**
PV MODULE MODEL	CS6.2-66TB-620
PV MODULE TYPE	BIFACIAL
INVERTER BRAND	SMA
INVERTER	SUNNY HIGH POWER PEAK3 150-US
GCR%	36.4%
RACKING	ATI
TOTAL # OF MODULES	4600
TOTAL # OF STRINGS	184
MODULES PER STRING	25
TOTAL # OF TRACKERS	48
TOTAL # OF INVERTERS	14
DC SYSTEM SIZE (MW)	2.852
AC SYSTEM SIZE (MW)	2.00
DC/AC RATIO	1.42
ROW SPACING	13.69'
ACCESS ROAD WIDTH	18'
MAX & MIN TEMP	35°C & -26°C
SNOW LOAD & WIND SPEED(RISK CATEGORY III)	25 LB/SQFT & 120 MPH

SOLARSTONE
SOLARSTONE PARTNERS
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MARCO ISLAND, FL 34145
www.solarstonepartners.com

wsb
WSB PROJECT NO.:
024543-000

WSB
701 XENIA AVE S, #300
GOLDEN VALLEY, MN 55416
(763) 541-4800

PLAN: ECY DESIGN: ECY
CHECK: LP / EZ

REVISIONS

NO.	DESCRIPTION	DATE

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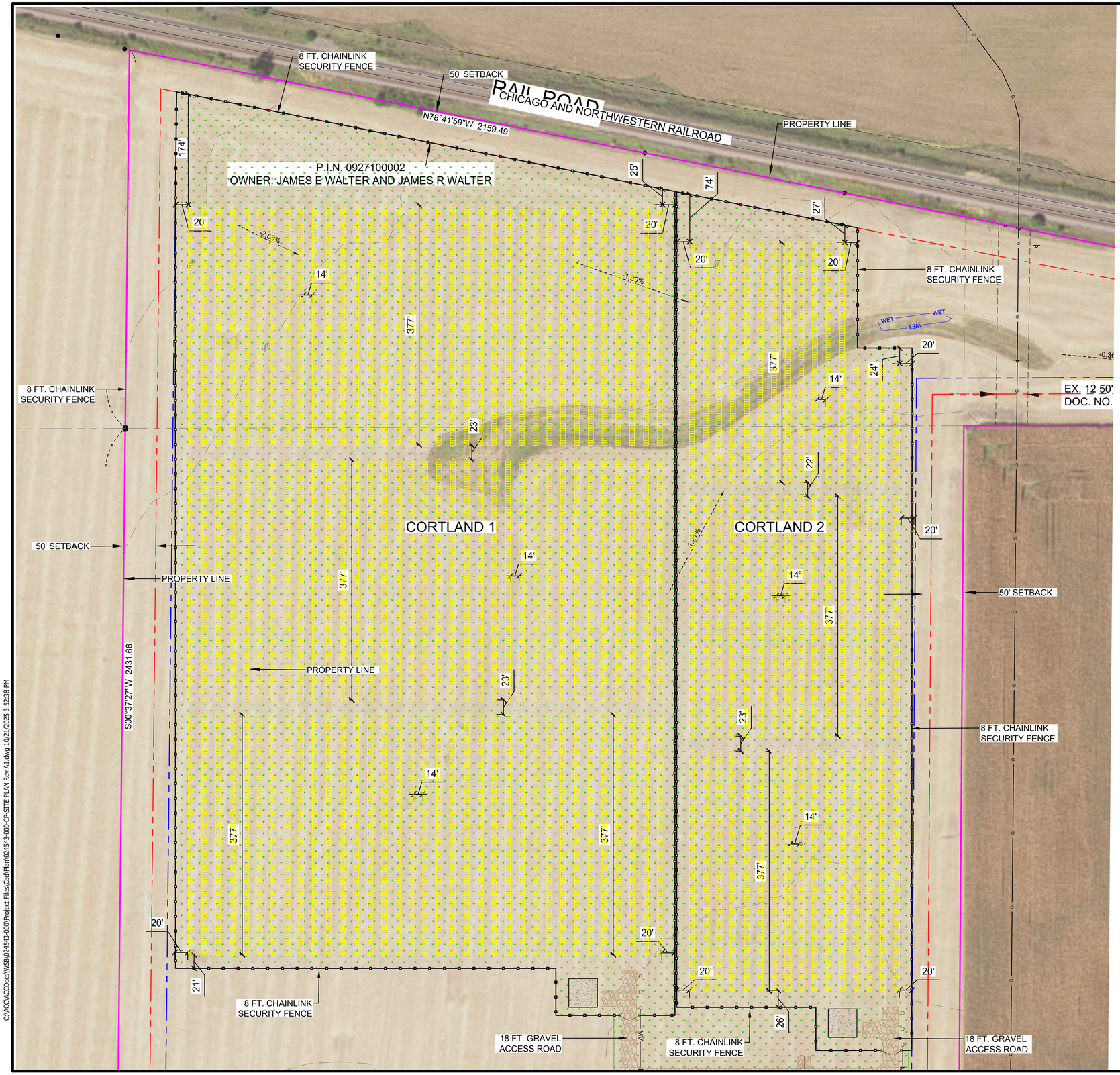
PLAN DATE: OCTOBER 15, 2025

CORTLAND 1 & 2 SOLAR PROJECTS
DEKALB COUNTY, IL
BLUE SOLAR ONE, LLC
SOLARSTONE DEVELOPMENT, LLC

OVERALL SITE PLAN

SHEET
C-001

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H: SCALE IN FEET

LEGEND

- DENOTES BUILDING SETBACK LINE
- DENOTES EXISTING PARCEL LINE
- DENOTES EXISTING CONTOUR
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AREA WITHIN PERIMETER FENCE - 34.30 ACRES

GENERAL NOTES

1. THE PURPOSE OF THIS PLAN IS FOR ZONING APPROVAL FOR REVIEW AND APPROVAL BY THE TOWN OF CORTLAND TO CONSTRUCT A SOLAR ENERGY SYSTEM.
2. THIS PLAN WAS PRODUCED UTILIZING GIS RESOURCES AND INFORMATION FROM MULTIPLE SOURCES, INCLUDING DEKALB COUNTY, USGS, FEMA, NATIONAL WETLANDS INVENTORY AND BING.
3. NO PORTION OF THE SUBJECT PROPERTY LIES WITHIN A SPECIAL FLOOD HAZARD AS SHOWN ON THE FLOOD INSURANCE RATE MAP, PUBLISHED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA).
4. NO PORTION OF THE SUBJECT PROPERTY CONTAINS KARST GEOLOGY ACCORDING TO THE U.S. GEOLOGICAL SURVEY OPEN-FILE REPORT.
5. A PORTION OF THE SUBJECT PROPERTY CONTAINS WELLS ACCORDING TO ILLINOIS STATE GEOLOGICAL SURVEY AND HOMELAND INFRASTRUCTURE FOUNDATION - LEVEL DATA.
6. THE BUILDABLE AREA EXCLUDES ALL CONSTRAINTS OF THE SITE, INCLUDING REQUIRED PANEL SETBACKS.
7. NO DRAIN TILE DATA PROVIDED OR SHOWN ON THIS CONSTRAINTS MAP.

SOLARSTONE
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wsb
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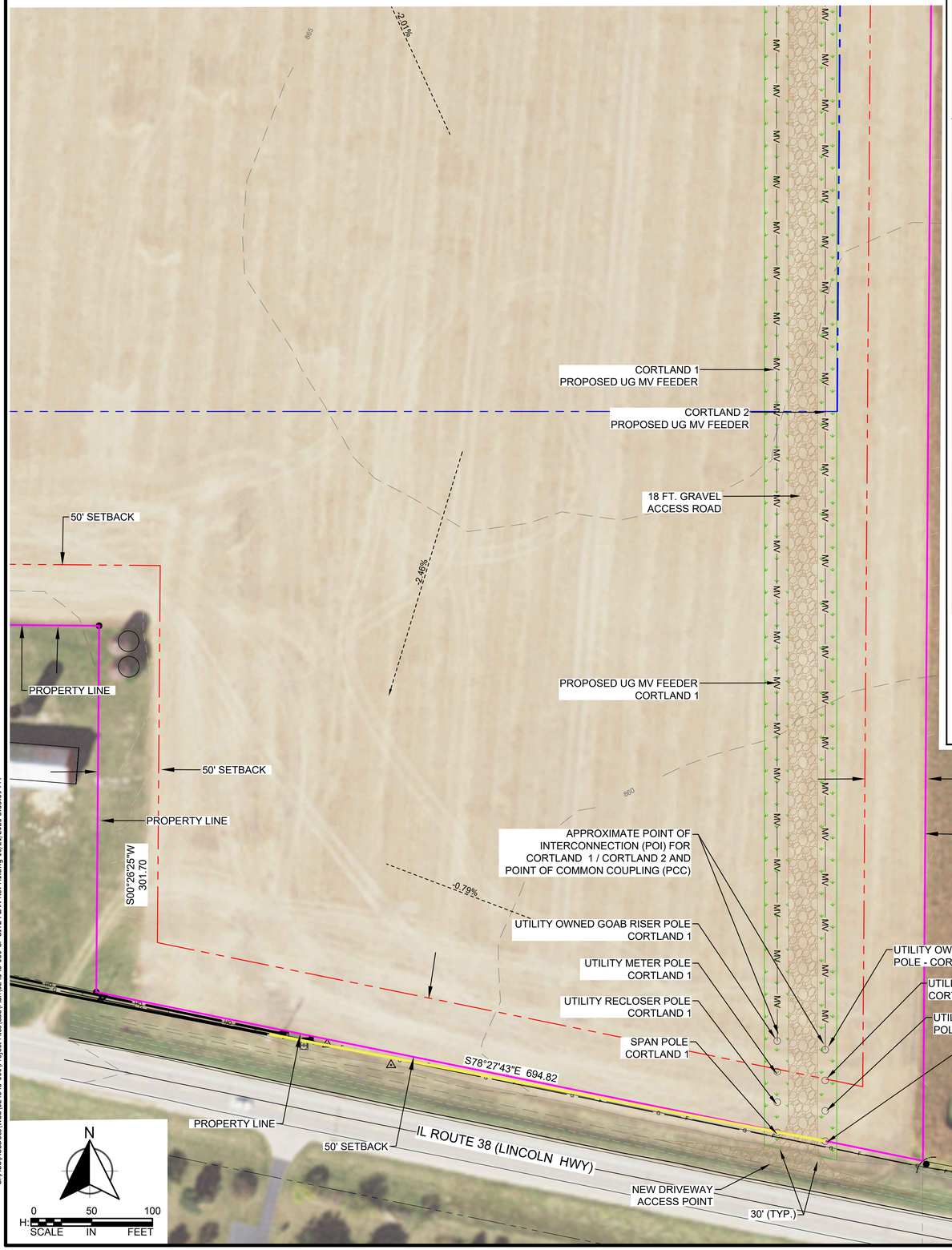
PRELIMINARY SITE PLAN SOLAR ARRAY DETAIL

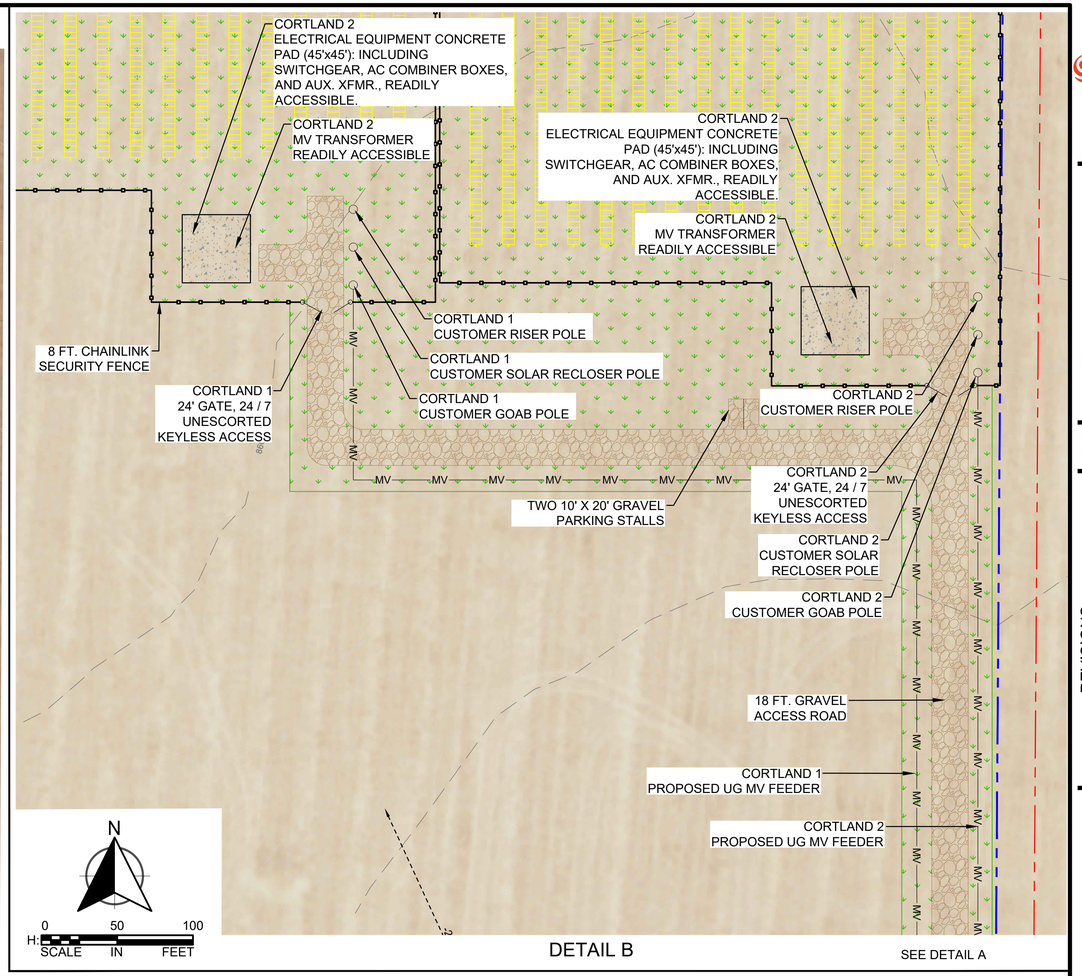
SHEET
C-002

C:\ACC\ACCDocs\WSB\024543-000\Project Files\Cad\Plan\024543-000-CP-SITE PLAN Rev A1.dwg 10/21/2025 3:52:38 PM

DETAIL A

SEE DETAIL B





DETAIL B

SEE DETAIL A

LEGEND

- DENOTES BUILDING SETBACK LINE
- DENOTES EXISTING PARCEL LINE
- DENOTES EXISTING CONTOUR
- DENOTES FEMA FLOODPLAIN
- DENOTES NWI WETLAND
- DENOTES LEVEL 2 WETLAND LINE
- DENOTES EXISTING WELL
- DENOTES 25 FOOT SETBACK LINE
- DENOTES PROPOSED PANELS
- DENOTES PROPOSED FENCE
- DENOTES PROPOSED UNDERGROUND MV FEEDER
- DENOTES PROPOSED GRAVEL ACCESS ROAD
- DENOTES PROPOSED CONCRETE
- DENOTES PROPOSED SEEDED AREA SHORT GROWTH PERENNIAL POLLINATORS

AREA WITHIN PERIMETER FENCE - 34.30 ACRES

CONSTRUCTION NOTES:

- GRAVEL ACCESS DRIVE WILL BE CONSTRUCTED OVER SUBGRADE STRIPPED OF ALL TOPSOIL AND ORGANICS.
- ROAD SECTION THICKNESS AS RECOMMENDED IN GEOTECH REPORT.
- 3:1 SLOPES MAXIMUM EXCEPT WHERE NOTED OTHERWISE.
- ALL DISTURBED AREAS TO BE RESTORED WITH NATIVE PERENNIAL SHORT GROWTH POLLINATOR SEED MIX.

UTILITY LOCATIONS NOTE:

PRIOR TO BEGINNING WORK ON THIS PROJECT, THE CONTRACTOR SHALL HAVE ALL PUBLIC AND PRIVATE UTILITY LOCATIONS MARKED ON THE PROJECT SITE.

DISCREPANCIES BETWEEN LOCATIONS SHOWN AS EXISTING CONDITIONS ON PLAN SHEETS AND THOSE ACTUALLY MARKED ON THE PROJECT SITE SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER/ENGINEER.

GENERAL NOTES:

CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING STRUCTURES, UTILITIES, TREES, SITE AMENITIES, ETC. THAT ARE TO REMAIN FROM DAMAGE DURING CONSTRUCTION.

CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ANY DAMAGE TO EXISTING ITEMS TO REMAIN (AT CONTRACTOR'S EXPENSE) AND IS CONSIDERED INCIDENTAL TO THE CONTRACT.

HORIZONTAL DATUM IS NSRS 2011 ILLINOIS STATE PLANES, WEST ZONE, US FOOT. VERTICAL DATUM IS BASED ON COUNTY LIDAR DATA.

SOLARSTONE
SOLARSTONE PARTNERS
1083 N. COLLIER BLVD., #408
MARCO ISLAND, FL 34145
www.solarstonepartners.com

wsb
WSB PROJECT NO.:
024543-000

WSB
701 XENIA AVE S, #300
GOLDEN VALLEY, MN 55416
(763) 541-4800

PLAN: ECY DESIGN: ECY
CHECK: LP / EZ

REVISIONS

NO.	DATE	DESCRIPTION

THIS DOCUMENT IS RELEASED FOR PERMITTING PURPOSES ONLY AND IS NOT FOR CONSTRUCTION

PLAN DATE : OCTOBER 15, 2025

CORTLAND 1 & 2 SOLAR PROJECTS
DEKALB COUNTY, IL
BLUE SOLAR ONE, LLC
SOLARSTONE DEVELOPMENT, LLC

PRELIMINARY SITE PLAN ACCESS ROAD DETAIL

SHEET
C-003

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Appendix B: Interconnection Status

Outlook

FW: State Route 38, DeKalb, Illinois 60115, 25-03483 has a new post

From brendan.cohen@solarstonepartners.com <brendan.cohen@solarstonepartners.com>
Date Tue 10/21/2025 10:20 AM
To 'Conner Sayles' <conner.sayles@solarstonepartners.com>

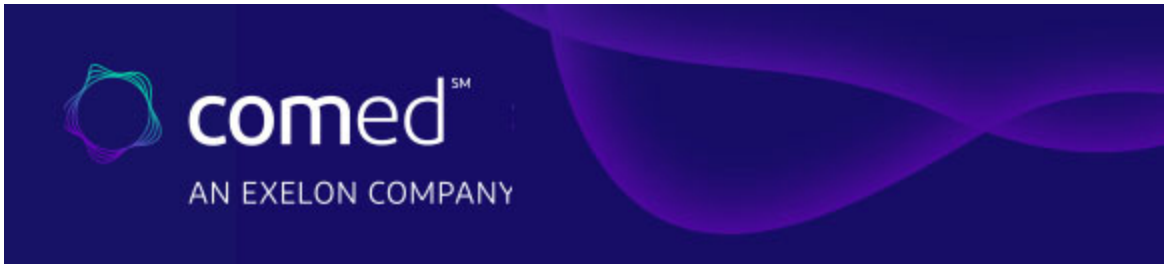
Cortland 1

Brendan Cohen
Senior Director - Project Development
Phone: 651-336-4640
Email: brendan.cohen@solarstonepartners.com
Website: www.solarstonepartners.com

SOLARSTONE

This email, and any files transmitted with it, is confidential and is intended solely for the use of the addressee. If you are not the addressee, please delete this email from your system.

From: no-reply@comed.com <no-reply@comed.com>
Sent: Monday, September 22, 2025 2:06 PM
To: brendan.cohen@solarstonepartners.com
Subject: State Route 38, DeKalb, Illinois 60115, 25-03483 has a new post



Dear Brendan Cohen,

Dear Valued Interconnection Customer,

You requested the payment option interconnection agreement for Project 25-03483. The revised Interconnection Agreement requiring your signature, is now available in the Documents section of your application.

You now have three options to pay the 100% customer deposit payment:
- Wire or check to ComEd
- Wire transfer to a JP Morgan interest bearing escrow account
- Letter of Credit

Attachment 3 has been updated and Attachment 9 has been added to reflect the above options. You will need to choose which option you intend to utilize and follow the outline below by 11/4/2025.

IF WIRE OR CHECK TO COMED PAYMENT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. pay the 100% deposit

IF ESCROW ACCOUNT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. execute the amendment to the interconnection agreement for the escrow account found in Attachment 9 and upload it to the ComEd interconnection portal
4. execute the JP Morgan escrow agreement found in Attachment 9 and upload it to the ComEd interconnection portal
5. set up and fully fund your escrow account with JP Morgan

IF LETTER OF CREDIT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. execute the amendment to the interconnection agreement for the letter of credit found in Attachment 9 and upload it to the ComEd interconnection portal
4. execute the letter of credit with your selected bank and upload it to the ComEd interconnection portal and send hardcopy to Exelon Corporation, 10 S. Dearborn, Floor 51, Chicago, IL 60603, (Attn: Enterprise Credit(Interconnection))
5. Provide your 25% first scheduled payment, as set forth in 3.4.1

Please review, complete, and execute the Interconnection Agreement within 30 business days. The signed agreement must be returned by 11/4/2025. If it is not received by 5:00 PM CST on 11/4/2025, the application will be considered withdrawn unless a written request for a 15-business-day extension is submitted prior to 11/4/2025. If you have any questions or need further clarification, feel free to reach out.

This interconnection request is eligible to participate in the Contact Sharing program. This initiative enables interconnection customers with assigned queue positions to request the sharing of contact information with other customers in the same substation queue.

If you would like to participate, please respond through the portal with the following message: "Yes – I would like to participate in Contact Sharing."

Thank you,
Lindsey Ewig

Contractors can check the latest activity for this application here:
https://secure.comed.com/ContractorConnect/

Sincerely,
ComEd

Outlook

FW: IL-38, DeKalb, Illinois 60115, 25-02614 has a new post

From brendan.cohen@solarstonepartners.com <brendan.cohen@solarstonepartners.com>
Date Tue 10/21/2025 10:17 AM
To 'Conner Sayles' <conner.sayles@solarstonepartners.com>

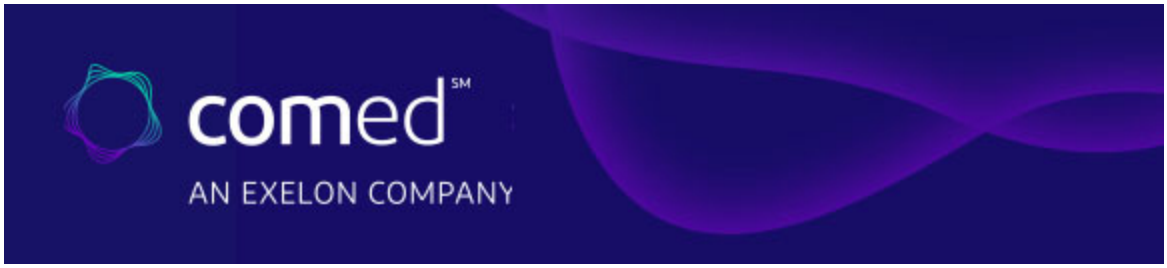
Cortland 2

Brendan Cohen
Senior Director - Project Development
Phone: 651-336-4640
Email: brendan.cohen@solarstonepartners.com
Website: www.solarstonepartners.com

SOLARSTONE

This email, and any files transmitted with it, is confidential and is intended solely for the use of the addressee. If you are not the addressee, please delete this email from your system.

From: no-reply@comed.com <no-reply@comed.com>
Sent: Monday, September 22, 2025 10:53 AM
To: brendan.cohen@solarstonepartners.com
Subject: IL-38, DeKalb, Illinois 60115, 25-02614 has a new post



Dear Brendan Cohen,

Dear Valued Interconnection Customer,

You requested the payment option interconnection agreement for Project 25-02614. The revised Interconnection Agreement requiring your signature, is now available in the Documents section of your application.

You now have three options to pay the 100% customer deposit payment:
- Wire or check to ComEd
- Wire transfer to a JP Morgan interest bearing escrow account
- Letter of Credit

Attachment 3 has been updated and Attachment 9 has been added to reflect the above options. You will need to choose which option you intend to utilize and follow the outline below by 11/4/2025.

IF WIRE OR CHECK TO COMED PAYMENT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. pay the 100% deposit

IF ESCROW ACCOUNT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. execute the amendment to the interconnection agreement for the escrow account found in Attachment 9 and upload it to the ComEd interconnection portal
4. execute the JP Morgan escrow agreement found in Attachment 9 and upload it to the ComEd interconnection portal
5. set up and fully fund your escrow account with JP Morgan

IF LETTER OF CREDIT IS SELECTED:
1. send a message through the ComEd interconnection portal as to your choice of payment
2. execute and upload the interconnection agreement to the ComEd interconnection portal
3. execute the amendment to the interconnection agreement for the letter of credit found in Attachment 9 and upload it to the ComEd interconnection portal
4. execute the letter of credit with your selected bank and upload it to the ComEd interconnection portal and send hardcopy to Exelon Corporation, 10 S. Dearborn, Floor 51, Chicago, IL 60603, (Attn: Enterprise Credit(Interconnection))
5. Provide your 25% first scheduled payment, as set forth in 3.4.1

Please review, complete, and execute the Interconnection Agreement within 30 business days. The signed agreement must be returned by 11/4/2025. If it is not received by 5:00 PM CST on 11/4/2025, the application will be considered withdrawn unless a written request for a 15-business-day extension is submitted prior to 11/4/2025. If you have any questions or need further clarification, feel free to reach out.

This interconnection request is eligible to participate in the Contact Sharing program. This initiative enables interconnection customers with assigned queue positions to request the sharing of contact information with other customers in the same substation queue.

If you would like to participate, please respond through the portal with the following message: "Yes – I would like to participate in Contact Sharing."

Thank you,
Lindsey Ewig

Contractors can check the latest activity for this application here:
https://secure.comed.com/ContractorConnect/

Sincerely,
ComEd

Appendix C: Stormwater Management Analysis

Memorandum

To: Cortland Illinois Solar, LLC

From: Earth Evans, PE, WSB
Michelle Jennings, EIT, WSB

Date: November 21, 2024
Revised October 14, 2025

Re: Cortland Solar Project Stormwater Management Analysis
WSB Project No. 024543-000

701 XENIA AVENUE S | SUITE 300 | MINNEAPOLIS, MN | 55416 | 763.541.4800 | WSBENG.COM

Project Summary

Cortland Illinois Solar, LLC is proposing to develop a 5-megawatt solar project (Cortland 1) and a 2-megawatt solar project (Cortland 2) within Dekalb County, Illinois. This project, referred to as Cortland Solar, is located in between State Route 38 and the Chicago and Northwestern Railroad, southeast of the City of Cortland, Illinois (***Figure 1***).

Site Characteristics

The Cortland Solar project site consists of approximately 80.3 total acres of cultivated crop, (***Figure 5***) based on the 2021 land use data.[1] The proposed solar panel area is 29.9 acres, and the estimated disturbed area is 37.5 acres (***Figure 6***). 37.6 acres of the site have Hydrologic Soil Group (HSG) D soils, 36.3 acres of the site have HSG C soils, and 6.4 acres of the site have HSG B soils (***Figure 4)***.[2]

The Cortland Solar project site includes a minor portion (approx. 0.5 acres) of the 100-year floodplain in the northeastern edge of the project boundary. This floodplain is classified as FEMA flood hazard area Zone A (i.e., floodplain without established Base Flood Elevation), per FEMA FIRM Panel 17037C0275E for Dekalb County, Illinois (***Figure 3A***).

There are no National Wetland Inventory (NWI) wetlands located within the project boundary. The level 2 wetland assessment determined approximately 114 square feet of wetland located outside of the northeastern edge of the proposed fence line. An offsite NWI freshwater emergent wetland is located just outside of the project boundary along the northeastern portion of the site (***Figure 3B***). The proposed solar panels arrays avoid impacts to the level 2 delineated wetlands within the site, and the offsite wetland by keeping the proposed solar panel area within the limits.

Summary of Findings

The Existing Conditions of the Cortland Solar project site consists of pervious surfaces with high peak flows and runoff volumes due to tighter soils that are not conducive to infiltration.

[1] National Land Cover Database. United States Geological Survey.
https://www.usgs.gov/centers/eros/science/national-land-cover-database
[2] Web Soil Survey. United States Department of Agriculture.
http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

The proposed development at the Cortland Solar project site will take place on the central portion of the site and will result in approximately 0.95 acres (41,453 sq ft) of new impervious surface consisting of 18-foot-wide access/maintenance roads and other project components. The proposed improvements will include replacing the existing pervious area within the proposed solar panel area with native short growth perennial pollinator mixes of grasses and flowers underneath the panels. Converting this existing pervious and impervious area with the proposed short growth pollinators will off-set the addition of the proposed impervious coverages and result in overall lower peak flow rates and runoff volumes from the project site. The proposed PV array avoids impacts to the offsite riverine wetland and onsite delineated wetland (***Figure 6***).

Because survey was not obtained for this site, this model utilized estimated outlet pipe sizes based on LiDAR and Google Earth measurements.

HydroCAD Model - Hydrologic Analysis

Using the Curve Number method, a hydrologic analysis was conducted at the Cortland Solar project site to determine the Peak Flow Rates and Runoff Volume for both Existing and Proposed Conditions. The analysis was developed using a HydroCAD model (version 10).

The rainfall distribution was based on the SCS Type II 24-hr storm type coupled with the Illinois State Water Survey Bulletin 70 rainfall depths data for: 24-hour 2-year, 10-year, 25-year, 50-year, and 100-year at the Cortland Solar project site (***Table 1***). The SCS type II distribution was used as an alternative to the Huff distributions presented in the Illinois State Survey Water Bulletin 70 per the Town of Cortland Illinois Stormwater Management Ordinance.

Table 1: Illinois State Water Bulletin 70[3]

Storm	Depth (in)
2-year	3.04
10-year	4.47
25-year	5.51
50-year	6.46
100-year	7.58

Site areas and composite curve numbers were determined using a GIS platform (ArcGIS Pro). An area weighted average was used to calculate the composite curve number. The soils at the project site are predominantly HSG D (approx. 37.6 acres) and HSG C (approx. 36.3 acres) with small areas of HSG B (approx. 6.4 acres) (***Figure 5)***.

Existing Conditions

The site was delineated into eleven separate drainage/tributary areas that include offsite areas that contribute flow into the site (***Figure 3B***). Drainage area delineations were based off existing contours, LiDAR, and existing roads. The proposed development is located within DA 8 and 9. Drainage will exit the site via a flow path that drains northeast through the center portion of the site into the floodplain to the northeast of the site.
The parameters of the culverts upstream of the Cortland Solar project site were assumed using LiDAR and Google Earth. Survey on these culverts was not obtained and dimensions were estimated for the hydrologic analysis.

[3] Frequency Distributions and Hydroclimatic Characteristics of Heavy Rainstorms in Illinois: Bulletin 70 https://www.isws.illinois.edu/pubdoc/B/ISWSB-70.pdf

An NWI riverine is located outside of the northeastern edge of the site. This riverine flowing to the south has multiple large tributary areas contributing flow to it. Due to the presence of this riverine, all areas contributing drainage to this riverine were assessed during the Hydrologic Analysis. Drainage will run from the high points west and southwest of the site and drain to the east. Because Drainage Areas 8 and 9 contain the proposed Cortland Solar development, the peak flows and runoff volumes leaving these drainage areas were assessed separately to properly determine the changes from Existing to Proposed Conditions. As a result, there is no change in peak flow or runoff rates from existing to proposed conditions for the remaining drainage areas.

Due to the large offsite area that contributes flow within Drainage Area 8, Drainage Area 8 was separated into two subcatchments for offsite and onsite drainage. Drainage Area 8 Onsite encloses the proposed solar panel area that will be revegetated from cultivated cropland to the proposed vegetation resulting in a reduction in curve number from Existing to Proposed Conditions. Because the remaining drainage areas did not enclose the solar panel area, there was no change in curve number from Existing to Proposed Conditions. Using the NRCS guidelines, the curve numbers for each drainage area summarized in **Table 2** were used to define the Existing Conditions.

The time of concentration was calculated using the Sheet Flow method with a P2 (2-year, 24-hr rainfall) value, the Shallow Concentrated Flow method with a velocity factor, and the Channel Flow method with a Manning's N number. The hydraulic data for the site's Existing Conditions are summarized in (***Table 2***). The hydraulic data for the site's Existing Conditions are summarized in (***Table 2***).

Table 2: Existing Project Site Characteristics

Drainage Area	Drainage Area (ac)	EX Impervious Area (ac)	Composite Curve Number	Time of Concentration (minutes)
DA-1	8.4	0.0	86	26.2
DA-2	4.3	0.1	86	10.7
DA-3	31.8	0.5	87	44.9
DA-4	1.9	0.1	87	11.3
DA-5	10.2	2.4	87	20.0
DA-6	12.7	1.9	86	20.0
DA-7	67.6	1.8	86	62.4
DA-8 Offsite	142.8	4.0	87	109.4
DA-8 Onsite	80.3	0.0	86	57.5
DA-9	14.1	0.7	85	20.0
DA-10	4.2	0.0	86	15.7
DA-11	1.5	0.3	87	18.7
Total	377.4	11.8	87	N/A

Proposed Conditions

The Proposed Conditions model was created by including proposed impervious surfaces such as access roads and other project components. Additionally, the buildable area under the panels will be revegetated with a specified native low-growth pollinator grass seed mix as the Best Management Practice (BMP) for this project. This BMP will act as a method to reduce Peak Flows and Runoff Volumes and treat infiltrated water before it leaves the site. It was assumed that soil underneath the panels will have improved infiltration properties with the addition of the short-growth native pollinator grasses.

Because such a small addition of impervious area is being constructed for this site and the disturbed area will be revegetated from bare untilled land, there was a decrease in the composite curve number for every drainage area which will result in lower runoff potential in proposed conditions. The proposed conditions were modeled to generate a conservative curve number using a surface description of a non-grazed meadow. The hydraulic data for the site's Proposed Conditions are summarized in (***Table 3***).

Table 3: Proposed Project Site Characteristics

Drainage Area	Drainage Area (ac)	EX Impervious Area (ac)	Total Impervious Area (ac)	Composite Curve Number	Time of Concentration (minutes)
DA-1	8.4	0.0	0.0	86	26.2
DA-2	4.3	0.1	0.1	86	10.7
DA-3	31.8	0.5	0.5	87	44.9
DA-4	1.9	0.1	0.1	87	11.3
DA-5	10.2	2.4	2.4	87	20.0
DA-6	12.7	1.9	1.9	86	20.0
DA-7	67.6	1.8	1.8	86	62.4
DA-8 Offsite	142.8	4.0	4.0	87	109.4
DA-8 Onsite	80.3	0.0	0.6	81	63.9
DA-9	14.1	0.7	1.0	85	20.0
DA-10	4.2	0.0	0.0	86	15.7
DA-11	1.5	0.3	0.3	87	18.7
Total	377.4	11.8	13.1	85	N/A

Hydrologic Runoff Analysis Results

Peak flow rates for the 2-year, 10-year, 25-year, 50-year, and 100-year storms were calculated at the Cortland Solar project site based on the drainage areas. The Hydrologic Runoff Analysis Results of this project illustrate Peak Flow and Runoff Volume values leaving the site overall. Runoff for the 2-year (***Table 4),*** 10-year (***Table 5***), 25-year (***Table 6***), 50-year (***Table 7***), and 100-year (***Table 8***) storms were calculated for the Existing and Proposed Conditions.

Table 4: 2-year Site Flows

Destination	Peak Flow (cfs)		Runoff Volume (af)	
	Existing	Proposed	Existing	Proposed
Leaving DA 8 Onsite	75.2	53.7	11.2	8.8
Leaving DA 9	25.4	25.4	1.9	1.9
Total	100.6	79.1	13.1	10.7

Table 5: 10-year Site Flows

Destination	Peak Flow (cfs)		Runoff Volume (af)	
	Existing	Proposed	Existing	Proposed
Leaving DA 8 Onsite	132.2	103.2	19.6	16.6
Leaving DA 9	45.0	45.0	3.4	3.4
Total	177.2	148.2	23.0	20.0

Table 6: 25-year Site Flows

Destination	Peak Flow (cfs)		Runoff Volume (af)	
	Existing	Proposed	Existing	Proposed
Leaving DA 8 Onsite	147.5	141.0	26.1	22.7
Leaving DA 9	59.5	59.5	4.5	4.5
Total	207.0	200.5	30.6	27.2

Table 7: 50-year Site Flows

Destination	Peak Flow (cfs)		Runoff Volume (af)	
	Existing	Proposed	Existing	Proposed
Leaving DA 8 Onsite	213.2	176.2	32.0	28.4
Leaving DA 9	72.9	72.9	5.5	5.5
Total	286.1	249.1	37.5	33.9

Table 8: 100-year Site Flows

Destination	Peak Flow (cfs)		Runoff Volume (af)	
	Existing	Proposed	Existing	Proposed
Leaving DA 8 Onsite	258.9	218.4	39.2	35.3
Leaving DA 9	88.6	88.6	6.8	6.8
Total	347.5	307.0	46.0	42.1

There is a large tributary area of approximately 290 acres that drains through the site. The flow path for this tributary area will be maintained from existing to proposed conditions. The limited added impervious surfaces in combination with revegetation of the disturbed area with a specified low-growth native seed mix as a stormwater management BMP would result in a net reduction in peak flow rates and runoff volumes.

No additional mitigating stormwater management BMPs based on the Town of Cortland's Stormwater Management requirements will be needed aside from erosion control BMP's that will be implemented as part of construction and as shown on the proposed erosion control plans and project Stormwater Pollution Prevention Plan (SWPPP) for future submittals.

OTHER CONSIDERATIONS:

Scour and Erosion Potential

The potential for scour is a function of localized topography and flow patterns. Due to moderate slopes, scour potential is unlikely. The erosion control plan will be developed to include potential BMPs such as silt fencing, straw waddles and other BMPs for erosion control during construction activities for the proposed conditions.

Town of Cortland Drainage Requirements[4]

Based on current city boundaries, the Cortland Solar Project is located outside of city limits. According to the City of Cortland Stormwater Ordinance, in all cases where a development lies within one and one-half (1.5) miles of the corporate limits of an incorporated municipality the development shall conform to all applicable ordinances and plans of such municipality. This project therefore follows the requirements of the City of Cortland stormwater ordinance. In the case that this property is annexed by the City, City requirements for stormwater management will be met.

Before beginning any construction, improvement or development of any structure, project or land, the Town of Cortland requires that no land disturbing activity shall be permitted which alters natural or manmade waterways or drainage features, including but not limited to ditches, culverts, swales, drain tiles, streams, rivers, ponds, lakes, wetlands and floodplains. Because the Cortland Solar project site will likely disturb more than 5,000 square feet of area, A Site Development Permit submitted to the Town of Cortland Zoning Office shall be required.

The City of Cortland Storm Water Management Ordinance states that a detention basin is required for any development resulting in greater than or equal to one acre of new impervious area. Because the current proposed impervious for the Cortland Solar Project is less than one acre, a detention basin is not required.

Regarding site runoff control requirements, the Town of Cortland requires that post-development discharge rates shall not exceed the Existing Conditions discharge rates for the 2-, 10-, 25-, 50- and 100-year critical duration storm events. Peak rates of discharge indicated by the post-development analysis are less than the peak rates of discharge indicated by the Existing Conditions as shown in ***Tables 4-8*** and minimizing impervious surfaces on the property, meeting the Town of Cortland runoff control requirements.

[4] Storm Water Management Ordinance: Town of Cortland, Illinois
https://library.municode.com/il/cortland/codes/code_of_ordinances?nodeId=TIT8BURE_CH2STWAMA

This project preserves natural features and existing natural streams, channels, and drainageways by utilizing a 50-foot floodplain/wetland buffer zone for all nearby floodplain and wetland features. This project's proposed BMP of revegetation of the buildable area with a short-growth perennial pollinator mix of grasses and flowers as natural landscaping further meets the runoff control requirements.

The following additional runoff requirements apply to this project: the proposed temporary and proposed soil erosion and sediment control practices that will be outlined in this project's SWPPP, a schedule of construction activities including, a plan for the short- and long-term maintenance and the responsible party for maintaining the storm water storage areas will be outlined in this project's SWPPP.

Permitting[5]

The following permits and documents may apply to this project.

An NPDES Construction General Permit application (CGP) under the state of Illinois and a Storm Water Pollution Prevention Plan (SWPPP) are typically needed if a site results in more than one acre of soil disturbance. Additionally, a Notice of Intent (NOI) must also be submitted along with the CGP and the SWPPP before the start of construction. The Illinois Environmental Protection Agency (IEPA) in compliance with the Federal Electronic Reporting Rule has transitioned all General Storm Water Permits for Construction Site Activities to the Central Data Exchange (CDX) resulting in the following construction permit forms to be submitted in order to submit the NOI:

- An electronic copy of the SWPPP;
- A copy of the Historic Preservation Office (SHPO) approval letter stating compliance with State law on historic preservation and endangered species;
- A copy of the Ecological Compliance Assessment Tool (EcoCAT) approval letter.

The NOI shall include the following information:

- The location of the construction site;
- The owner's information;
- The names of receiving waters;
- The number of NPDES permits for any discharge from the site;
- A detailed scope of the project.

A Site Development Permit submitted to the Town of Cortland is required if the following conditions are met:

- The development results in greater than or equal to one acre of new impervious area.
- The development resulting in less than one acre of new impervious area and is part of a larger common plan of development.
- The development disturbs mor than five thousand (5,000) square feet of land.

The proposed development and grading operations will likely result in more than one acre of soil disturbance thus triggering the need for an NPDES permit, a SWPPP, an Operations and Maintenance Plan, and a Notice of Intent to be submitted to the Illinois Environmental Protection Agency Stormwater Program which administers the NPDES permit and the NOI for the State of Illinois.

[5] Illinois Environmental Protection Agency. NPDES Permit for Construction Activities. https://www2.illinois.gov/epa/topics/forms/water-permits/storm-water/Pages/construction.aspx

The proposed development will result in creating 21,036 square feet of new impervious and likely disturb more than 5,000 square feet of land thus triggering the Town of Cortland Site Development Permit. Because this site will likely disturb more than 5,000 square feet of land, this project shall follow the Soil Erosion and Sediment Control guidelines outlined in the Town of Cortland's Stormwater Ordinance for future submittals.

Floodplain and Wetland Considerations

As stated above, there is one NWI wetland (approx. 0.1 acres) within the northeastern edge of the Cortland Solar project site referred to as a riverine. The level 2 wetland assessment determined approximately 114 square feet of wetland located outside of the northeastern portion of the proposed fence line. There is also a freshwater wetland located approximately 663 feet northwest of the at the closest ***(Figure 3B)***. This project does not propose solar panel arrays near the onsite or offsite NWI wetlands or level 2 wetlands, avoiding impacts.

Although the Cortland Solar project site includes a minor portion (approx. 0.1 acres) of FEMA Zone A, no solar arrays are proposed within FEMA Zone A floodplain zone, or the floodplain features nor is the site near or within FEMA Zone A or the floodplain features.

The Cortland Solar project site includes a minor portion (approx. 0.5 acres) of the 100-year floodplain, classified as FEMA flood hazard area Zone A (i.e., floodplain without established Base Flood Elevation), per FEMA FIRM Panel 17037C0275E for Dekalb County, Illinois (***Figure 3A***). This wetland is located in the northeastern edge of the site.

Attachments:

Existing

- Figure 1 - Project Location
- Figure 2 - Property Details
- Figure 3A - FEMA Floodplain Map
- Figure 3B – Existing Conditions Drainage Map
- Figure 4 - Hydrologic Soils Map
- Figure 5 - Land Cover Map

Proposed

- Figure 6 – Proposed Site Plan

FEMA FIRM Panel 17037C0275E
HydroCAD Model

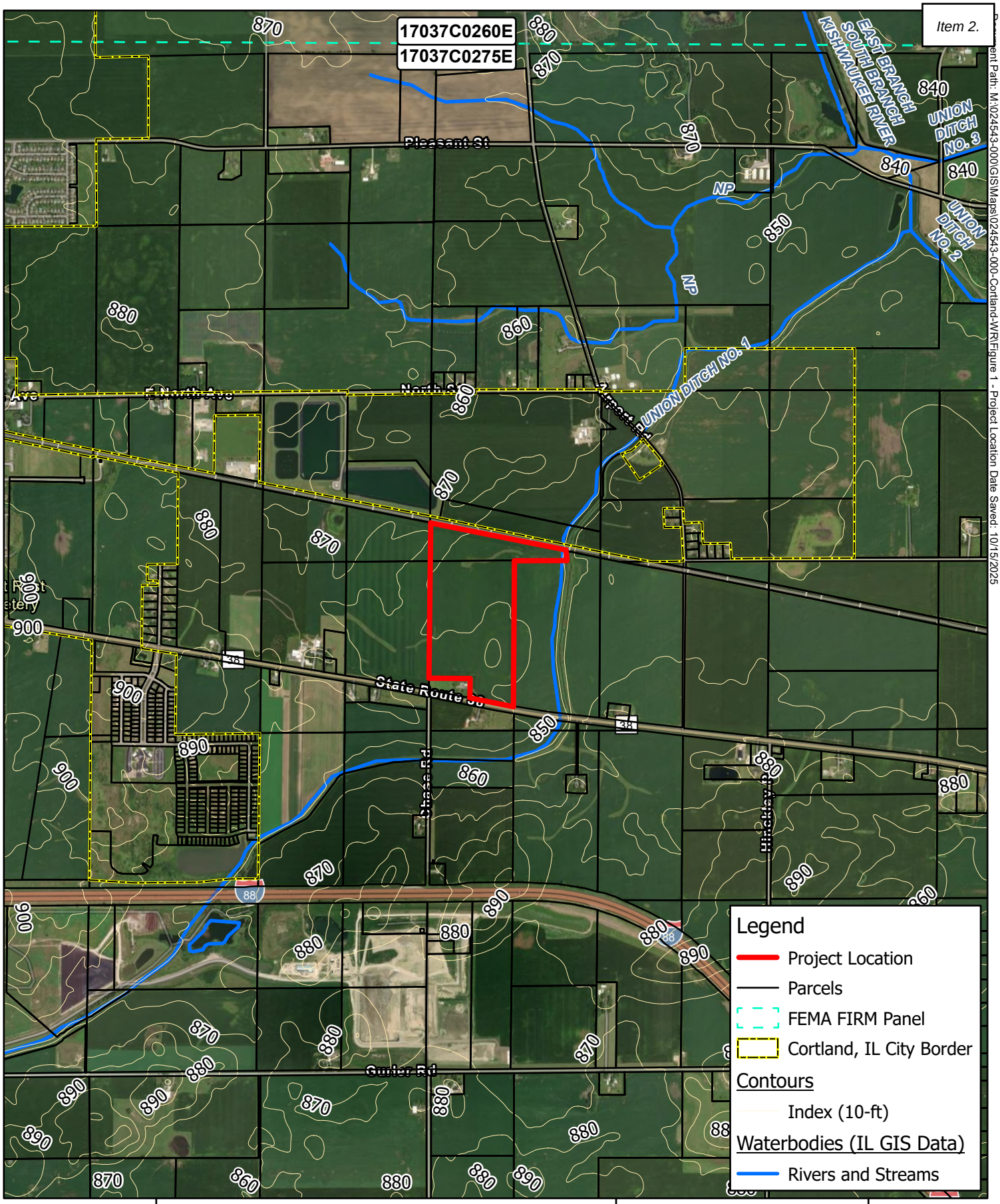


Figure 1: Project Location

Cortland Solar Development
Cortland Illinois Solar, LLC

N

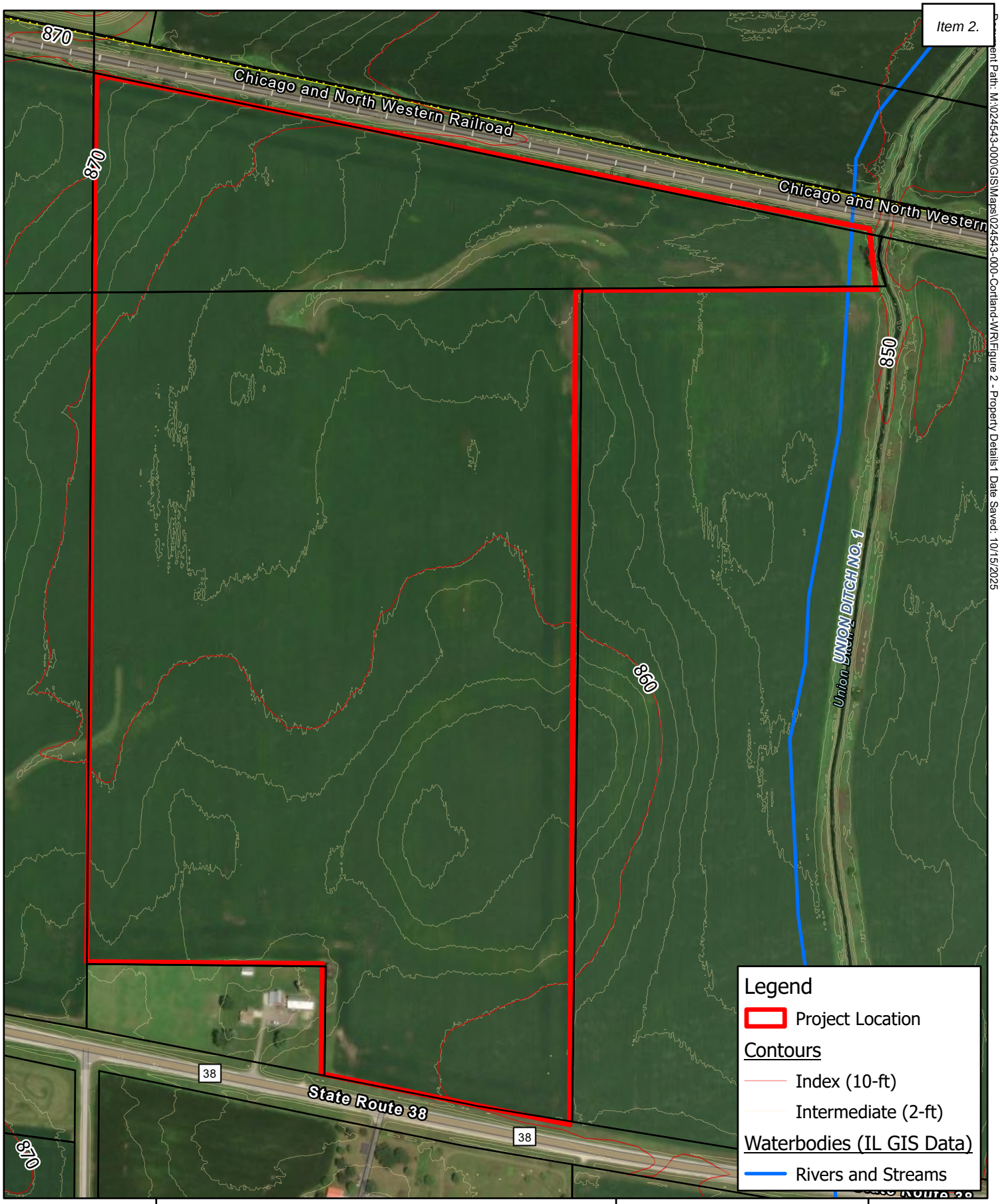
0 2,000 Feet

1 inch = 2,000 feet

SOLARSTONE

WSP

Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WR\Figure 1 - Project Location Date Saved: 10/15/2025



Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 2 - Property Details1 Date Saved: 10/15/2025

Figure 2 - Property Details

Cortland Solar Development
Cortland Illinois Solar, LLC

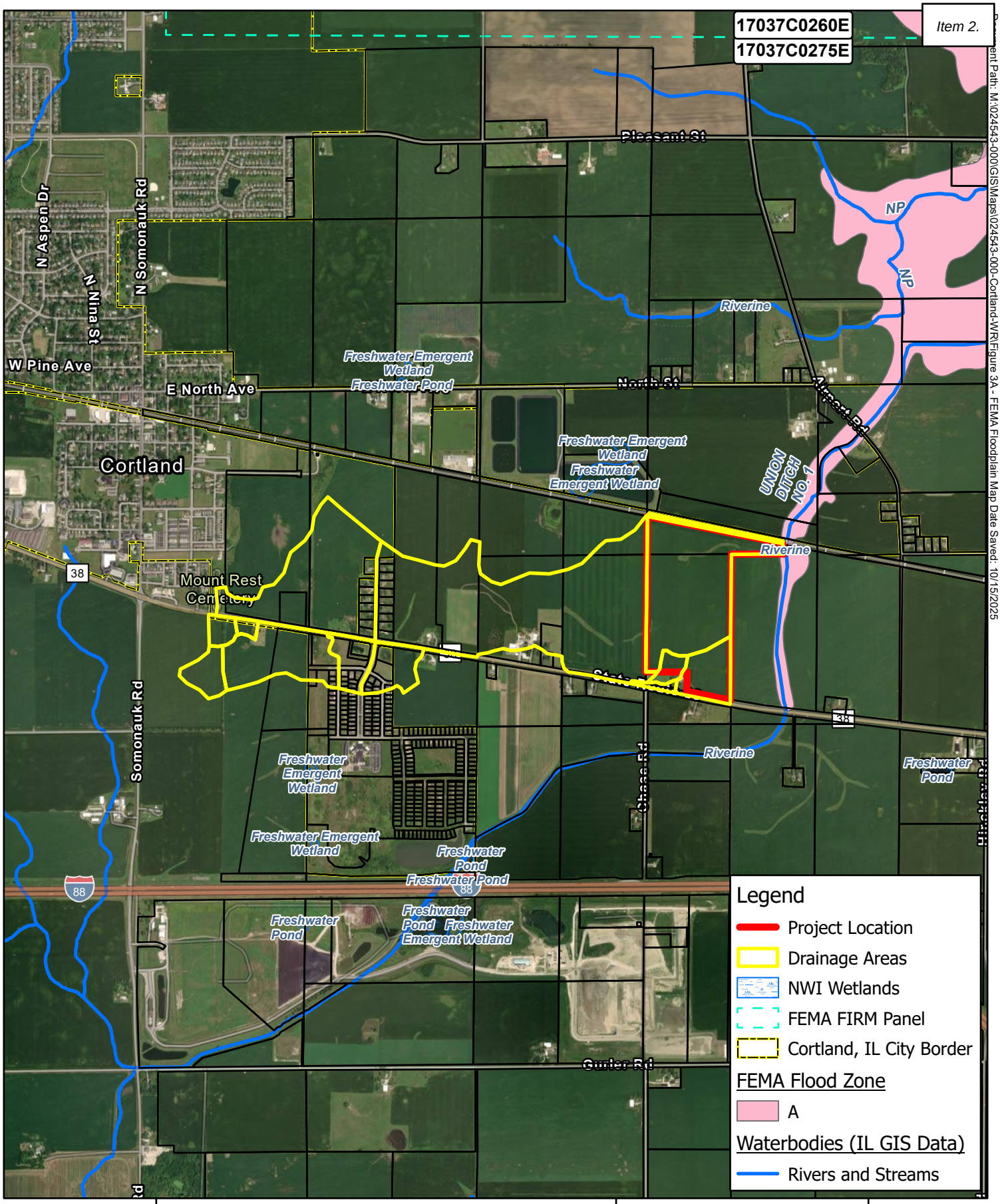
SOLARSTONE

N

0 350 Feet

1 inch = 350 feet

WSP



Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 3A - FEMA Floodplain Map Date Saved: 10/15/2025

Figure 3A - FEMA Floodplain Map

Cortland Solar Development
Cortland Illinois Solar, LLC

N

0 2,000 Feet

1 inch = 2,000 feet

SOLARSTONE

WSP

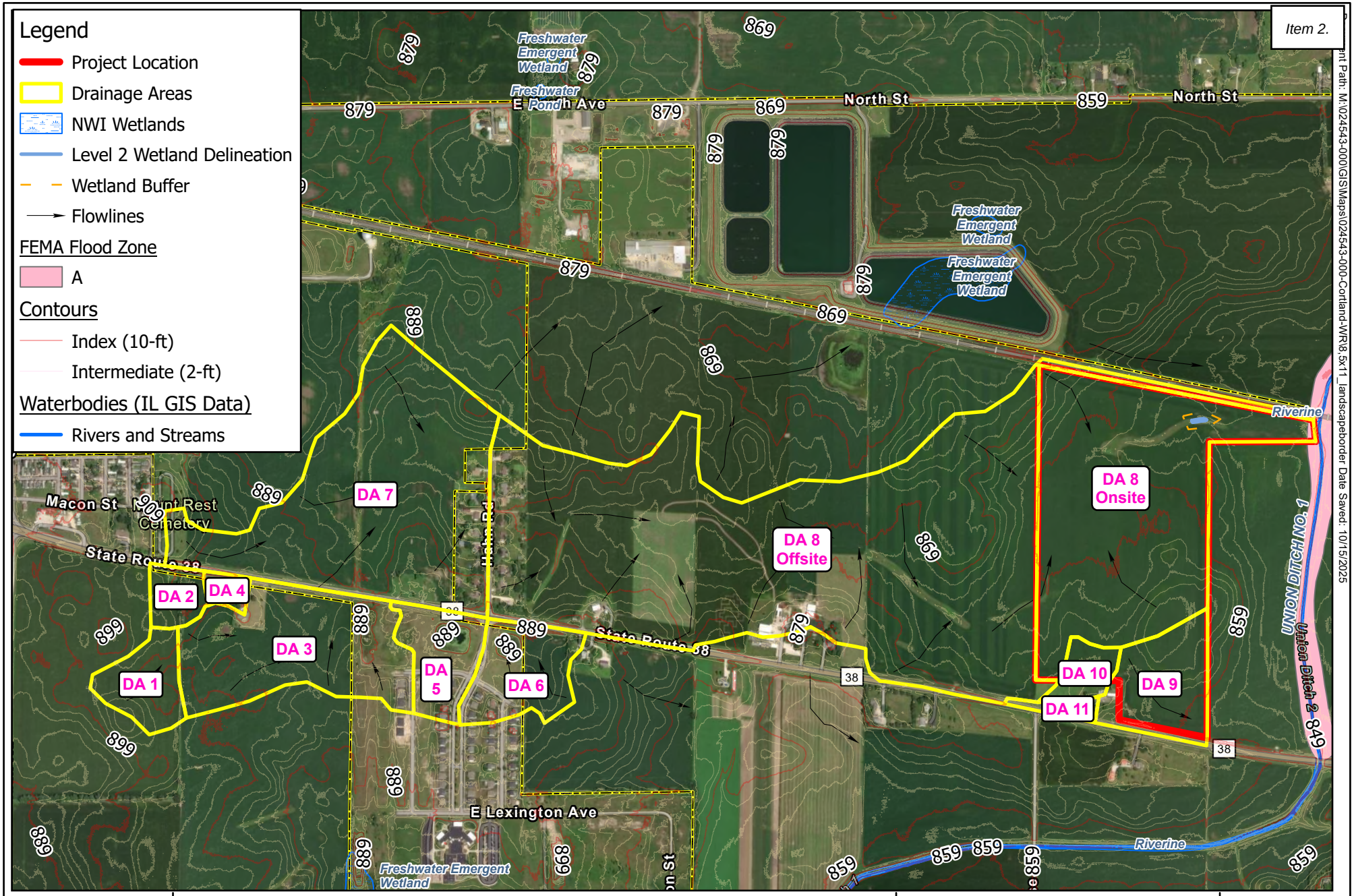


Figure 3B - Existing Drainage Area Map

Cortland Solar Development
Cortland Illinois Solar, LLC

N

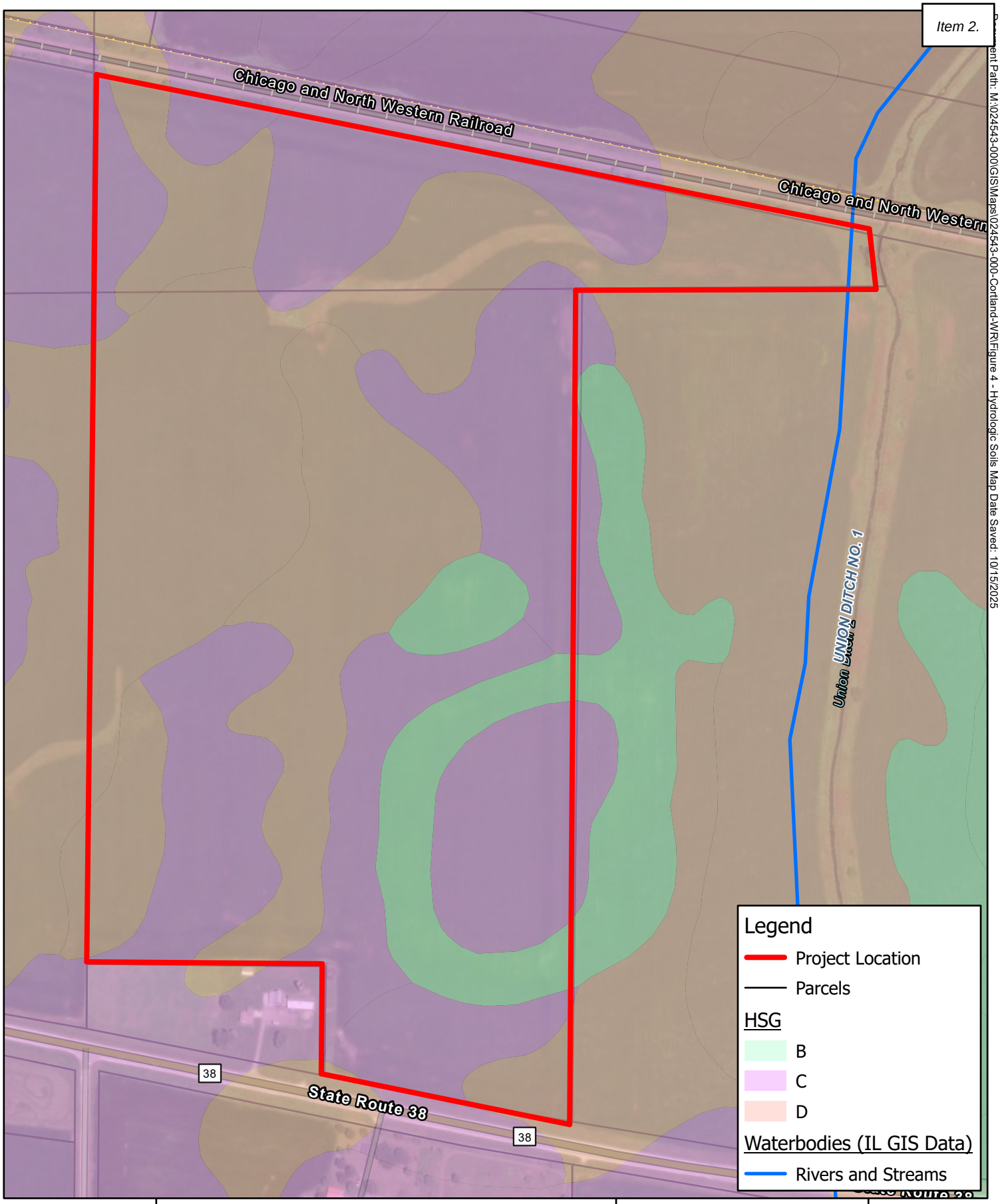
0 1,000 Feet

1 inch = 1,000 feet

SOLARSTONE

WSP

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Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 4 - Hydrologic Soils Map Date Saved: 10/15/2025

Figure 4 - Hydrologic Soils Map

Cortland Solar Development
Cortland Illinois Solar, LLC

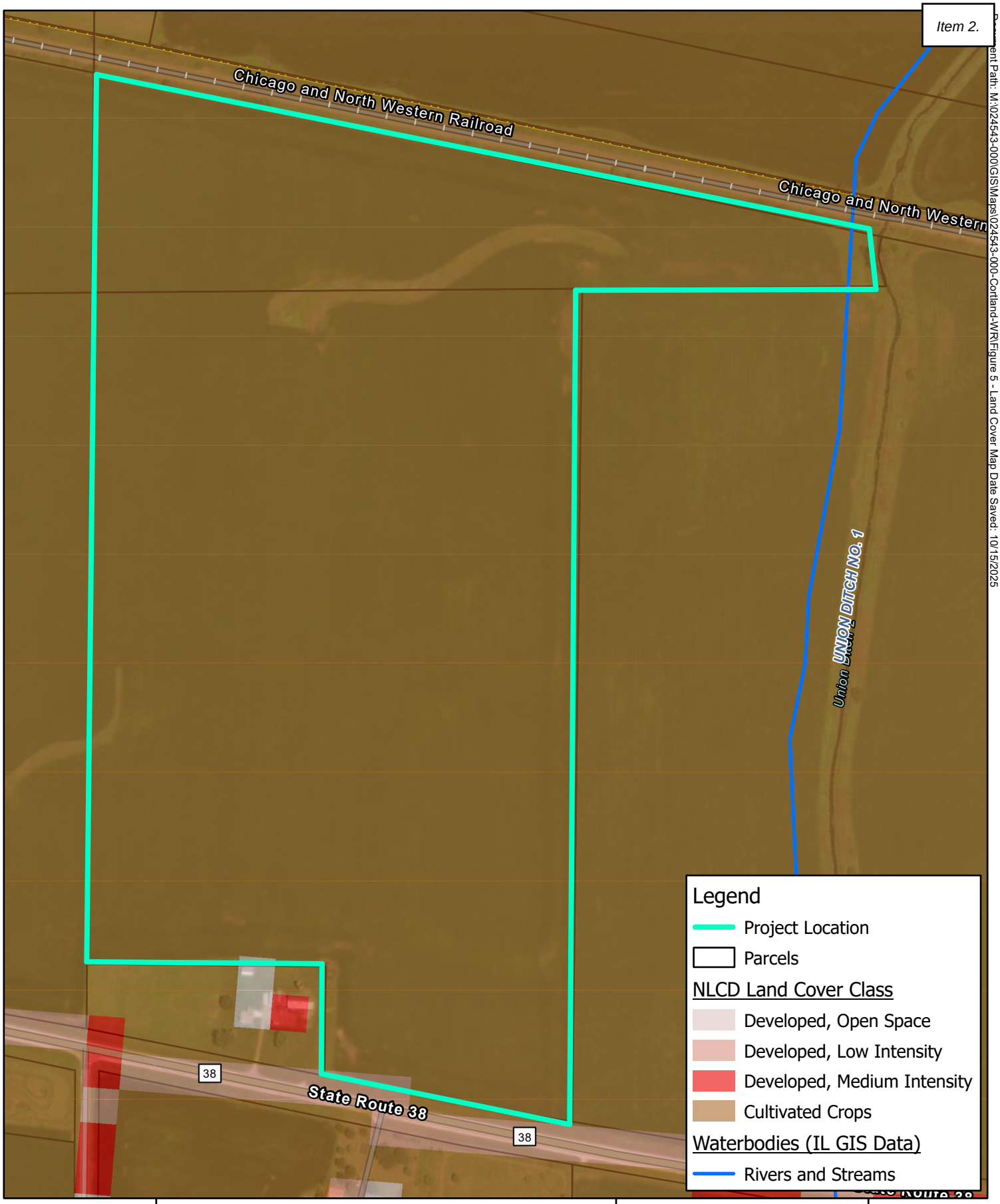
SOLARSTONE

N

0 350 Feet

1 inch = 350 feet

WSP



Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 5 - Land Cover Map Date Saved: 10/15/2025

SOLARSTONE

Figure 5 - Land Cover Map

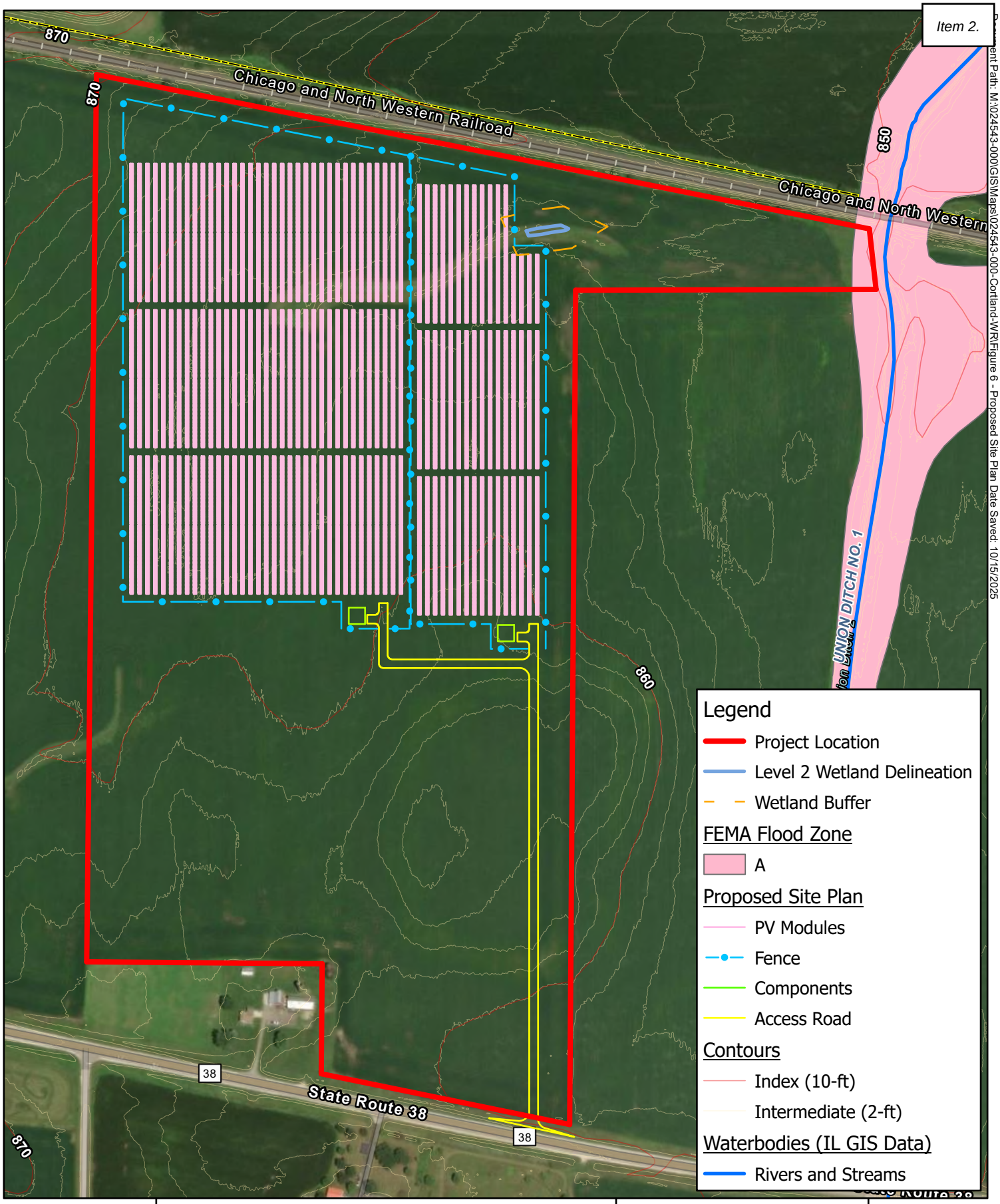
Cortland Solar Development
Cortland Illinois Solar, LLC

N

0 350 Feet

1 inch = 350 feet

WSP



Document Path: M:\024543-000\GIS\Maps\024543-000-Cortland-WRI\Figure 6 - Proposed Site Plan Date Saved: 10/15/2025

Figure 6 - Proposed Site Plan

Cortland Solar Development
Cortland Illinois Solar, LLC

SOLARSTONE

N

0 350 Feet

1 inch = 350 feet

WSP

Item 2.

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or flood plain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and flood plain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

In the State of Illinois, any portion of a stream or watercourse that lies within the **floodway fringe** of a studied (AE) stream may have a state regulated floodway. The FIRM may not depict these state regulated floodways.

Floodways restricted by anthropogenic features such as bridges and culverts are drawn to reflect natural conditions and may not agree with the model computed widths listed in the Floodway Data table in the Flood Insurance Study report.

Multiple **topographic sources** may have been used in the delineation of Special Flood Hazard Areas. See Flood Insurance Study report for details on source resolution and geographic extent.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 16. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services, NOAA, N/NGS12
National Geodetic Survey SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the United States Geological Survey. Digital orthoimagery with a spatial resolution of 0.5 meter ground sample distance were photogrammetrically compiled from aerial photography acquired during the leaf-off period of spring 2005.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The Special Flood Hazard Areas and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

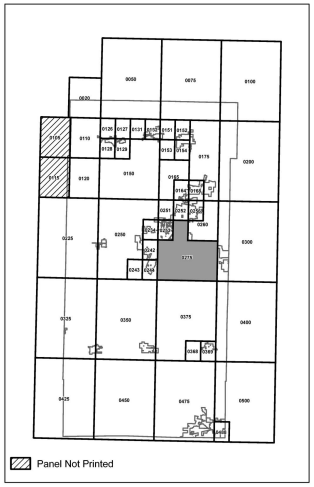
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

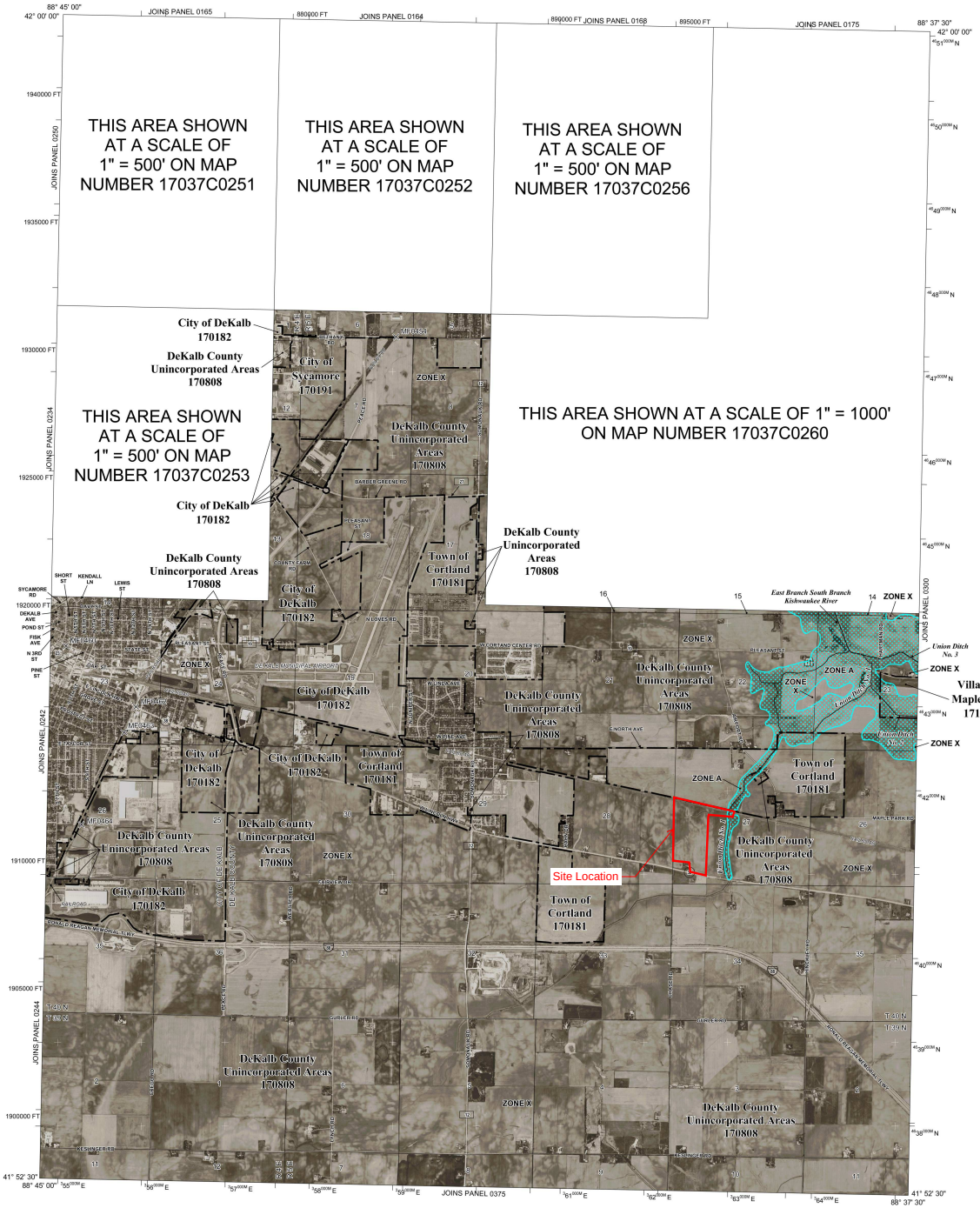
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital version of this map. The FEMA Map Service Center may also be reached by fax at 1-800-358-9620 and its website at www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov/business/nfip.

PANEL INDEX





LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. The SFHA includes Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 — 23	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4989000 N	1000-meter Universal Transverse Mercator grid values, zone 16
1565000 FT	5000-foot grid tick: Illinois State Plane East Coordinate System, 3776 zone (FIPSZONE 1201) Transverse Mercator
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
SEPTEMBER 21, 2000

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
January 2, 2009 - to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET
600 0 600 1200 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0275E

FIRM

FLOOD INSURANCE RATE MAP

DEKALB COUNTY, ILLINOIS

AND INCORPORATED AREAS

PANEL 275 OF 500

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CORTLAND, TOWN OF	170181	0275	E
DEKALB COUNTY	170808	0275	E
DEKALB, CITY OF	170182	0275	E
MAPLE PARK, VILLAGE OF	171018	0275	E
SYCAMORE, CITY OF	170191	0275	E

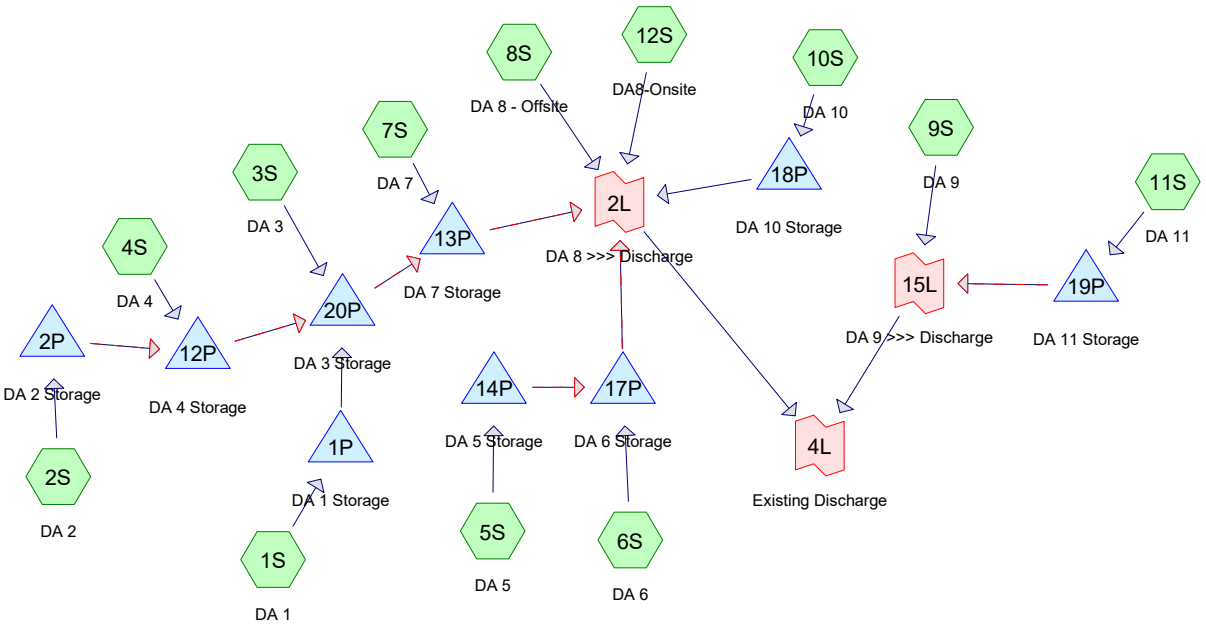
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 17037C0275E

MAP REVISED JANUARY 2, 2009

Federal Emergency Management Agency

Existing Conditions



Subcat Reach Pond Link

Routing Diagram for Cortland Solar Existing
Prepared by WSB & Associates Inc, Printed 10/15/2025
HydroCAD® 10.20-7a s/n 00883 © 2025 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year Bulletin 70	Type II 24-hr		Default	24.00	1	3.04	2
2	10-Year Bulletin 70	Type II 24-hr		Default	24.00	1	4.47	2
3	25-Year Bulletin 70	Type II 24-hr		Default	24.00	1	5.51	2
4	50-Year Bulletin 70	Type II 24-hr		Default	24.00	1	6.46	2
5	100-Year Bulletin 70	Type II 24-hr		Default	24.00	1	7.58	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
13.139	80	1/2 acre lots, 25% imp, HSG C (5S, 6S, 7S, 8S)
4.319	85	1/2 acre lots, 25% imp, HSG D (5S, 6S, 7S, 8S)
7.700	98	EX Imp (2S, 3S, 4S, 5S, 6S, 7S, 9S, 11S)
3.970	98	Ex Imp (8S)
3.593	79	Pasture/grassland/range, Fair, HSG C (7S, 8S)
3.079	84	Pasture/grassland/range, Fair, HSG D (7S, 8S)
8.905	78	Row crops, straight row, Good, HSG B (9S, 12S)
198.922	85	Row crops, straight row, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S)
136.342	89	Row crops, straight row, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S)
379.969	**86**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
8.905	HSG B	9S, 12S
215.654	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S
143.740	HSG D	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S
11.670	Other	2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 11S
379.969		**TOTAL AREA**

Cortland Solar Existing
Prepared by WSB & Associates Inc
Printed 10/15/2025
HydroCAD® 10.20-7a s/n 00883 © 2025 HydroCAD Software Solutions LLC

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	13.139	4.319	0.000	17.458	1/2 acre lots, 25% imp	
0.000	0.000	0.000	0.000	7.700	7.700	EX Imp	
0.000	0.000	0.000	0.000	3.970	3.970	Ex Imp	
0.000	0.000	3.593	3.079	0.000	6.672	Pasture/grassland/range, Fair	
0.000	8.905	198.922	136.342	0.000	344.169	Row crops, straight row, Good	
0.000	**8.905**	**215.654**	**143.740**	**11.670**	**379.969**	**TOTAL AREA**	

Cortland Solar Existing
Prepared by WSB & Associates Inc
Printed 10/15/2025
HydroCAD® 10.20-7a s/n 00883 © 2025 HydroCAD Software Solutions LLC

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Nod Nam
1	2P	897.00	896.25	37.0	0.0203	0.025	0.0	12.0	0.0	
2	12P	895.00	894.20	40.0	0.0200	0.025	0.0	12.0	0.0	
3	13P	879.00	878.65	45.0	0.0078	0.025	0.0	12.0	0.0	
4	14P	889.18	888.20	138.0	0.0071	0.012	0.0	15.0	0.0	
5	17P	886.93	884.76	63.0	0.0344	0.012	0.0	18.0	0.0	
6	19P	862.00	861.90	38.0	0.0026	0.025	0.0	12.0	0.0	
7	20P	890.27	890.13	47.0	0.0030	0.025	0.0	12.0	0.0	

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>1.69"
Flow Length=697' Tc=26.2 min CN=86 Runoff=13.61 cfs 1.186 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>1.69"
Flow Length=412' Tc=10.7 min CN=86 Runoff=10.97 cfs 0.608 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>1.75"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=37.30 cfs 4.644 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>1.77"
Flow Length=419' Tc=11.3 min CN=87 Runoff=4.99 cfs 0.283 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>1.77"
Tc=20.0 min CN=87 Runoff=20.07 cfs 1.497 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>1.69"
Tc=20.0 min CN=86 Runoff=24.06 cfs 1.793 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>1.67"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=59.45 cfs 9.403 af

Subcatchment 8S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>1.72"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=86.22 cfs 20.498 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>1.61"
Flow Length=838' Tc=20.0 min CN=85 Runoff=25.44 cfs 1.896 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>1.69"
Flow Length=529' Tc=15.7 min CN=86 Runoff=9.08 cfs 0.595 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>1.77"
Flow Length=696' Tc=18.7 min CN=87 Runoff=3.16 cfs 0.226 af

Subcatchment 12S: DA8-Onsite Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>1.67"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=75.19 cfs 11.181 af

Pond 1P: DA 1 Storage Peak Elev=898.81' Storage=37,429 cf Inflow=13.61 cfs 1.186 af
Outflow=0.71 cfs 0.342 af

Pond 2P: DA 2 Storage Peak Elev=897.55' Storage=14,028 cf Inflow=10.97 cfs 0.608 af
Primary=0.89 cfs 0.484 af Secondary=0.00 cfs 0.000 af Outflow=0.89 cfs 0.484 af

Pond 12P: DA 4 Storage Peak Elev=895.85' Storage=4,744 cf Inflow=5.44 cfs 0.768 af
Primary=1.83 cfs 0.751 af Secondary=0.00 cfs 0.000 af Outflow=1.83 cfs 0.751 af

Pond 13P: DA 7 Storage Peak Elev=881.11' Storage=273,890 cf Inflow=59.86 cfs 10.456 af
Primary=2.94 cfs 2.842 af Secondary=3.50 cfs 1.817 af Outflow=6.44 cfs 4.659 af

Pond 14P: DA 5 Storage Peak Elev=889.76' Storage=169,367 cf Inflow=20.07 cfs 1.497 af
Primary=1.39 cfs 0.980 af Secondary=0.00 cfs 0.000 af Outflow=1.39 cfs 0.980 af

Pond 17P: DA 6 Storage Peak Elev=888.02' Storage=106,374 cf Inflow=24.52 cfs 2.772 af
Primary=4.90 cfs 2.391 af Secondary=0.00 cfs 0.000 af Outflow=4.90 cfs 2.391 af

Pond 18P: DA 10 Storage Peak Elev=863.42' Storage=17,721 cf Inflow=9.08 cfs 0.595 af
Outflow=0.41 cfs 0.203 af

Pond 19P: DA 11 Storage Peak Elev=863.30' Storage=1,895 cf Inflow=3.16 cfs 0.226 af
Primary=1.76 cfs 0.225 af Secondary=0.00 cfs 0.000 af Outflow=1.76 cfs 0.225 af

Pond 20P: DA 3 Storage Peak Elev=891.25' Storage=441,668 cf Inflow=39.11 cfs 5.736 af
Primary=1.28 cfs 1.053 af Secondary=0.00 cfs 0.000 af Outflow=1.28 cfs 1.053 af

Link 2L: DA 8 >>> Discharge Inflow=140.78 cfs 38.932 af
Primary=140.78 cfs 38.932 af

Link 4L: Existing Discharge Inflow=144.87 cfs 41.053 af
Primary=144.87 cfs 41.053 af

Link 15L: DA 9 >>> Discharge Inflow=27.07 cfs 2.121 af
Primary=27.07 cfs 2.121 af

Total Runoff Area = 379.969 ac Runoff Volume = 53.809 af Average Runoff Depth = 1.70"
95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac

Summary for Subcatchment 1S: DA 1

Runoff = 13.61 cfs @ 12.20 hrs, Volume= 1.186 af, Depth> 1.69"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 10.97 cfs @ 12.02 hrs, Volume= 0.608 af, Depth> 1.69"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 37.30 cfs @ 12.42 hrs, Volume= 4.644 af, Depth> 1.75"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 4.99 cfs @ 12.03 hrs, Volume= 0.283 af, Depth> 1.77"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 20.07 cfs @ 12.12 hrs, Volume= 1.497 af, Depth> 1.77"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 24.06 cfs @ 12.13 hrs, Volume= 1.793 af, Depth> 1.69"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 59.45 cfs @ 12.68 hrs, Volume= 9.403 af, Depth> 1.67"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 86.22 cfs @ 13.25 hrs, Volume= 20.498 af, Depth> 1.72"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 25.44 cfs @ 12.13 hrs, Volume= 1.896 af, Depth> 1.61"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.505	78	Row crops, straight row, Good, HSG B
	9.212	85	Row crops, straight row, Good, HSG C
	1.735	89	Row crops, straight row, Good, HSG D
	14.102	85	Weighted Average
	13.452		95.39% Pervious Area
	0.650		4.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 9.08 cfs @ 12.08 hrs, Volume= 0.595 af, Depth> 1.69"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 3.16 cfs @ 12.11 hrs, Volume= 0.226 af, Depth> 1.77"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA8-Onsite

Runoff = 75.19 cfs @ 12.59 hrs, Volume= 11.181 af, Depth> 1.67"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

Area (ac)	CN	Description
37.600	89	Row crops, straight row, Good, HSG D
36.300	85	Row crops, straight row, Good, HSG C
6.400	78	Row crops, straight row, Good, HSG B
80.300	86	Weighted Average
80.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
22.2	1,200	0.0100	0.90		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
57.5	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 13.61 cfs @ 12.20 hrs, Volume= 1.186 af
Outflow = 0.71 cfs @ 14.94 hrs, Volume= 0.342 af, Atten= 95%, Lag= 164.5 min
Primary = 0.71 cfs @ 14.94 hrs, Volume= 0.342 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.81' @ 14.94 hrs Surf.Area= 74,193 sf Storage= 37,429 cf

Plug-Flow detention time= 379.2 min calculated for 0.342 af (29% of inflow)
Center-of-Mass det. time= 249.6 min (1,085.8 - 836.2)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.71 cfs @ 14.94 hrs HW=898.81' TW=891.10' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.71 cfs @ 0.33 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 10.97 cfs @ 12.02 hrs, Volume= 0.608 af
Outflow = 0.89 cfs @ 12.73 hrs, Volume= 0.484 af, Atten= 92%, Lag= 42.4 min
Primary = 0.89 cfs @ 12.73 hrs, Volume= 0.484 af
Routed to Pond 12P : DA 4 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.55' @ 12.73 hrs Surf.Area= 33,582 sf Storage= 14,028 cf

Plug-Flow detention time= 243.2 min calculated for 0.484 af (80% of inflow)
Center-of-Mass det. time= 160.5 min (984.9 - 824.3)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.89 cfs @ 12.73 hrs HW=897.55' TW=895.81' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 0.89 cfs @ 2.94 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=897.00' TW=895.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 1.48" for 2-Year Bulletin 70 event
Inflow = 5.44 cfs @ 12.04 hrs, Volume= 0.768 af
Outflow = 1.83 cfs @ 12.31 hrs, Volume= 0.751 af, Atten= 66%, Lag= 16.6 min
Primary = 1.83 cfs @ 12.31 hrs, Volume= 0.751 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 895.85' @ 12.31 hrs Surf.Area= 10,246 sf Storage= 4,744 cf

Plug-Flow detention time= 41.6 min calculated for 0.750 af (98% of inflow)
Center-of-Mass det. time= 30.3 min (954.7 - 924.4)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.83 cfs @ 12.31 hrs HW=895.85' TW=890.54' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.83 cfs @ 3.48 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 1.10" for 2-Year Bulletin 70 event
Inflow = 59.86 cfs @ 12.68 hrs, Volume= 10.456 af
Outflow = 6.44 cfs @ 15.79 hrs, Volume= 4.659 af, Atten= 89%, Lag= 186.5 min
Primary = 2.94 cfs @ 15.79 hrs, Volume= 2.842 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 3.50 cfs @ 15.79 hrs, Volume= 1.817 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.11' @ 15.79 hrs Surf.Area= 321,111 sf Storage= 273,890 cf

Plug-Flow detention time= 333.0 min calculated for 4.659 af (45% of inflow)
Center-of-Mass det. time= 191.4 min (1,081.6 - 890.3)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.94 cfs @ 15.79 hrs HW=881.11' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.94 cfs @ 3.74 fps)

Secondary OutFlow Max=3.50 cfs @ 15.79 hrs HW=881.11' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 3.50 cfs @ 0.84 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 1.77" for 2-Year Bulletin 70 event
Inflow = 20.07 cfs @ 12.12 hrs, Volume= 1.497 af
Outflow = 1.39 cfs @ 13.57 hrs, Volume= 0.980 af, Atten= 93%, Lag= 86.7 min
Primary = 1.39 cfs @ 13.57 hrs, Volume= 0.980 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 889.76' @ 13.57 hrs Surf.Area= 79,483 sf Storage= 169,367 cf (38,449 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 204.2 min (1,032.0 - 827.8)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.39 cfs @ 13.57 hrs HW=889.76' TW=887.94' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.39 cfs @ 3.67 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 1.45" for 2-Year Bulletin 70 event
Inflow = 24.52 cfs @ 12.13 hrs, Volume= 2.772 af
Outflow = 4.90 cfs @ 12.74 hrs, Volume= 2.391 af, Atten= 80%, Lag= 36.7 min
Primary = 4.90 cfs @ 12.74 hrs, Volume= 2.391 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 888.02' @ 12.74 hrs Surf.Area= 37,003 sf Storage= 106,374 cf (38,860 cf above start)

Plug-Flow detention time= 510.0 min calculated for 0.841 af (30% of inflow)
Center-of-Mass det. time= 88.9 min (991.2 - 902.3)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.90 cfs @ 12.74 hrs HW=888.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 4.90 cfs @ 3.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 9.08 cfs @ 12.08 hrs, Volume= 0.595 af
Outflow = 0.41 cfs @ 14.16 hrs, Volume= 0.203 af, Atten= 95%, Lag= 124.7 min
Primary = 0.41 cfs @ 14.16 hrs, Volume= 0.203 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.42' @ 14.16 hrs Surf.Area= 54,352 sf Storage= 17,721 cf

Plug-Flow detention time= 345.4 min calculated for 0.203 af (34% of inflow)
Center-of-Mass det. time= 220.4 min (1,048.6 - 828.2)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.41 cfs @ 14.16 hrs HW=863.42' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.37 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 1.77" for 2-Year Bulletin 70 event
Inflow = 3.16 cfs @ 12.11 hrs, Volume= 0.226 af
Outflow = 1.76 cfs @ 12.27 hrs, Volume= 0.225 af, Atten= 44%, Lag= 9.7 min
Primary = 1.76 cfs @ 12.27 hrs, Volume= 0.225 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.30' @ 12.28 hrs Surf.Area= 3,490 sf Storage= 1,895 cf

Plug-Flow detention time= 15.2 min calculated for 0.225 af (99% of inflow)
Center-of-Mass det. time= 12.0 min (838.8 - 826.8)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.76 cfs @ 12.27 hrs HW=863.30' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.76 cfs @ 2.26 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=862.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 1.48" for 2-Year Bulletin 70 event
Inflow = 39.11 cfs @ 12.42 hrs, Volume= 5.736 af
Outflow = 1.28 cfs @ 24.00 hrs, Volume= 1.053 af, Atten= 97%, Lag= 694.7 min
Primary = 1.28 cfs @ 24.00 hrs, Volume= 1.053 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 891.25' @ 24.00 hrs Surf.Area= 268,996 sf Storage= 441,668 cf (203,998 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 251.6 min (1,126.8 - 875.2)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.28 cfs @ 24.00 hrs HW=891.25' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.28 cfs @ 2.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 1.28" for 2-Year Bulletin 70 event
Inflow = 140.78 cfs @ 12.84 hrs, Volume= 38.932 af
Primary = 140.78 cfs @ 12.84 hrs, Volume= 38.932 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 1.30" for 2-Year Bulletin 70 event
Inflow = 144.87 cfs @ 12.78 hrs, Volume= 41.053 af
Primary = 144.87 cfs @ 12.78 hrs, Volume= 41.053 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 1.63" for 2-Year Bulletin 70 event
Inflow = 27.07 cfs @ 12.13 hrs, Volume= 2.121 af
Primary = 27.07 cfs @ 12.13 hrs, Volume= 2.121 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=697' Tc=26.2 min CN=86 Runoff=23.75 cfs 2.082 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>2.97"
Flow Length=412' Tc=10.7 min CN=86 Runoff=18.90 cfs 1.066 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>3.04"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=64.42 cfs 8.048 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>3.06"
Flow Length=419' Tc=11.3 min CN=87 Runoff=8.48 cfs 0.491 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>3.06"
Tc=20.0 min CN=87 Runoff=34.38 cfs 2.592 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>2.96"
Tc=20.0 min CN=86 Runoff=41.86 cfs 3.146 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>2.93"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=104.36 cfs 16.518 af

Subcatchment 8S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>2.99"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=149.67 cfs 35.585 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>2.87"
Flow Length=838' Tc=20.0 min CN=85 Runoff=44.98 cfs 3.370 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=529' Tc=15.7 min CN=86 Runoff=15.74 cfs 1.044 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>3.06"
Flow Length=696' Tc=18.7 min CN=87 Runoff=5.40 cfs 0.392 af

Subcatchment 12S: DA8-Onsite Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>2.93"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=132.20 cfs 19.638 af

Pond 1P: DA 1 Storage Peak Elev=898.89' Storage=43,911 cf Inflow=23.75 cfs 2.082 af
Outflow=9.71 cfs 1.232 af

Pond 2P: DA 2 Storage Peak Elev=897.81' Storage=23,723 cf Inflow=18.90 cfs 1.066 af
Primary=1.71 cfs 0.843 af Secondary=1.40 cfs 0.064 af Outflow=3.11 cfs 0.907 af

Pond 12P: DA 4 Storage Peak Elev=896.34' Storage=11,331 cf Inflow=9.60 cfs 1.398 af
Primary=2.82 cfs 1.373 af Secondary=0.00 cfs 0.000 af Outflow=2.82 cfs 1.373 af

Pond 13P: DA 7 Storage Peak Elev=881.43' Storage=387,065 cf Inflow=105.51 cfs 18.309 af
Primary=3.24 cfs 3.180 af Secondary=26.72 cfs 8.957 af Outflow=29.96 cfs 12.136 af

Pond 14P: DA 5 Storage Peak Elev=890.08' Storage=197,189 cf Inflow=34.38 cfs 2.592 af
Primary=2.95 cfs 1.896 af Secondary=0.00 cfs 0.000 af Outflow=2.95 cfs 1.896 af

Pond 17P: DA 6 Storage Peak Elev=888.83' Storage=137,094 cf Inflow=43.20 cfs 5.042 af
Primary=9.12 cfs 4.548 af Secondary=0.00 cfs 0.000 af Outflow=9.12 cfs 4.548 af

Pond 18P: DA 10 Storage Peak Elev=863.51' Storage=22,709 cf Inflow=15.74 cfs 1.044 af
Outflow=4.53 cfs 0.648 af

Pond 19P: DA 11 Storage Peak Elev=863.75' Storage=4,005 cf Inflow=5.40 cfs 0.392 af
Primary=2.40 cfs 0.390 af Secondary=0.00 cfs 0.000 af Outflow=2.40 cfs 0.390 af

Pond 20P: DA 3 Storage Peak Elev=891.85' Storage=623,637 cf Inflow=75.61 cfs 10.653 af
Primary=2.02 cfs 1.792 af Secondary=0.00 cfs 0.000 af Outflow=2.02 cfs 1.792 af

Link 2L: DA 8 >>> Discharge Inflow=253.85 cfs 72.555 af
Primary=253.85 cfs 72.555 af

Link 4L: Existing Discharge Inflow=260.64 cfs 76.315 af
Primary=260.64 cfs 76.315 af

Link 15L: DA 9 >>> Discharge Inflow=47.01 cfs 3.761 af
Primary=47.01 cfs 3.761 af

Total Runoff Area = 379.969 ac Runoff Volume = 93.971 af Average Runoff Depth = 2.97"
95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac

Summary for Subcatchment 1S: DA 1

Runoff = 23.75 cfs @ 12.20 hrs, Volume= 2.082 af, Depth> 2.96"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 18.90 cfs @ 12.02 hrs, Volume= 1.066 af, Depth> 2.97"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 64.42 cfs @ 12.42 hrs, Volume= 8.048 af, Depth> 3.04"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 8.48 cfs @ 12.03 hrs, Volume= 0.491 af, Depth> 3.06"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 34.38 cfs @ 12.12 hrs, Volume= 2.592 af, Depth> 3.06"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 41.86 cfs @ 12.12 hrs, Volume= 3.146 af, Depth> 2.96"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 104.36 cfs @ 12.68 hrs, Volume= 16.518 af, Depth> 2.93"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 149.67 cfs @ 13.25 hrs, Volume= 35.585 af, Depth> 2.99"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 44.98 cfs @ 12.12 hrs, Volume= 3.370 af, Depth> 2.87"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.505	78	Row crops, straight row, Good, HSG B
	9.212	85	Row crops, straight row, Good, HSG C
	1.735	89	Row crops, straight row, Good, HSG D
	14.102	85	Weighted Average
	13.452		95.39% Pervious Area
	0.650		4.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 15.74 cfs @ 12.07 hrs, Volume= 1.044 af, Depth> 2.96"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 5.40 cfs @ 12.11 hrs, Volume= 0.392 af, Depth> 3.06"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA8-Onsite

Runoff = 132.20 cfs @ 12.59 hrs, Volume= 19.638 af, Depth> 2.93"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

Area (ac)	CN	Description
37.600	89	Row crops, straight row, Good, HSG D
36.300	85	Row crops, straight row, Good, HSG C
6.400	78	Row crops, straight row, Good, HSG B
80.300	86	Weighted Average
80.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
22.2	1,200	0.0100	0.90		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
57.5	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 2.96" for 10-Year Bulletin 70 event
Inflow = 23.75 cfs @ 12.20 hrs, Volume= 2.082 af
Outflow = 9.71 cfs @ 12.53 hrs, Volume= 1.232 af, Atten= 59%, Lag= 19.7 min
Primary = 9.71 cfs @ 12.53 hrs, Volume= 1.232 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.89' @ 12.53 hrs Surf.Area= 79,992 sf Storage= 43,911 cf

Plug-Flow detention time= 198.7 min calculated for 1.232 af (59% of inflow)
Center-of-Mass det. time= 93.5 min (914.0 - 820.5)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.71 cfs @ 12.53 hrs HW=898.89' TW=891.03' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 9.71 cfs @ 0.79 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 2.97" for 10-Year Bulletin 70 event
Inflow = 18.90 cfs @ 12.02 hrs, Volume= 1.066 af
Outflow = 3.11 cfs @ 12.34 hrs, Volume= 0.907 af, Atten= 84%, Lag= 19.2 min
Primary = 1.71 cfs @ 12.34 hrs, Volume= 0.843 af
Routed to Pond 12P : DA 4 Storage
Secondary = 1.40 cfs @ 12.34 hrs, Volume= 0.064 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.81' @ 12.34 hrs Surf.Area= 41,166 sf Storage= 23,723 cf

Plug-Flow detention time= 211.0 min calculated for 0.907 af (85% of inflow)
Center-of-Mass det. time= 143.9 min (952.4 - 808.5)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=1.71 cfs @ 12.34 hrs HW=897.81' TW=896.26' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 1.71 cfs @ 3.43 fps)

Secondary OutFlow Max=1.40 cfs @ 12.34 hrs HW=897.81' TW=896.26' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.40 cfs @ 0.60 fps)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 2.69" for 10-Year Bulletin 70 event
Inflow = 9.60 cfs @ 12.04 hrs, Volume= 1.398 af
Outflow = 2.82 cfs @ 13.37 hrs, Volume= 1.373 af, Atten= 71%, Lag= 80.1 min
Primary = 2.82 cfs @ 13.37 hrs, Volume= 1.373 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 896.34' @ 12.82 hrs Surf.Area= 16,752 sf Storage= 11,331 cf

Plug-Flow detention time= 48.6 min calculated for 1.372 af (98% of inflow)
Center-of-Mass det. time= 39.2 min (940.0 - 900.9)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.82 cfs @ 13.37 hrs HW=896.28' TW=891.47' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.82 cfs @ 3.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 1.93" for 10-Year Bulletin 70 event
Inflow = 105.51 cfs @ 12.68 hrs, Volume= 18.309 af
Outflow = 29.96 cfs @ 13.75 hrs, Volume= 12.136 af, Atten= 72%, Lag= 64.6 min
Primary = 3.24 cfs @ 13.75 hrs, Volume= 3.180 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 26.72 cfs @ 13.75 hrs, Volume= 8.957 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.43' @ 13.75 hrs Surf.Area= 397,587 sf Storage= 387,065 cf

Plug-Flow detention time= 235.8 min calculated for 12.136 af (66% of inflow)
Center-of-Mass det. time= 122.4 min (996.3 - 873.9)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.24 cfs @ 13.75 hrs HW=881.43' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.24 cfs @ 4.13 fps)

Secondary OutFlow Max=26.72 cfs @ 13.75 hrs HW=881.43' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 26.72 cfs @ 1.69 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 3.06" for 10-Year Bulletin 70 event
Inflow = 34.38 cfs @ 12.12 hrs, Volume= 2.592 af
Outflow = 2.95 cfs @ 13.12 hrs, Volume= 1.896 af, Atten= 91%, Lag= 59.9 min
Primary = 2.95 cfs @ 13.12 hrs, Volume= 1.896 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 890.08' @ 13.12 hrs Surf.Area= 93,948 sf Storage= 197,189 cf (66,271 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 198.8 min (1,011.2 - 812.4)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.95 cfs @ 13.12 hrs HW=890.08' TW=888.77' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.95 cfs @ 4.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 2.64" for 10-Year Bulletin 70 event
Inflow = 43.20 cfs @ 12.13 hrs, Volume= 5.042 af
Outflow = 9.12 cfs @ 12.71 hrs, Volume= 4.548 af, Atten= 79%, Lag= 35.4 min
Primary = 9.12 cfs @ 12.71 hrs, Volume= 4.548 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 888.83' @ 12.71 hrs Surf.Area= 39,104 sf Storage= 137,094 cf (69,580 cf above start)

Plug-Flow detention time= 329.8 min calculated for 2.998 af (59% of inflow)
Center-of-Mass det. time= 84.1 min (973.3 - 889.2)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.12 cfs @ 12.71 hrs HW=888.83' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 9.12 cfs @ 5.16 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 2.96" for 10-Year Bulletin 70 event
Inflow = 15.74 cfs @ 12.07 hrs, Volume= 1.044 af
Outflow = 4.53 cfs @ 12.35 hrs, Volume= 0.648 af, Atten= 71%, Lag= 16.6 min
Primary = 4.53 cfs @ 12.35 hrs, Volume= 0.648 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.51' @ 12.35 hrs Surf.Area= 59,490 sf Storage= 22,709 cf

Plug-Flow detention time= 197.5 min calculated for 0.648 af (62% of inflow)
Center-of-Mass det. time= 93.4 min (905.7 - 812.4)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.53 cfs @ 12.35 hrs HW=863.51' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 4.53 cfs @ 0.82 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 3.06" for 10-Year Bulletin 70 event
Inflow = 5.40 cfs @ 12.11 hrs, Volume= 0.392 af
Outflow = 2.40 cfs @ 12.33 hrs, Volume= 0.390 af, Atten= 56%, Lag= 13.1 min
Primary = 2.40 cfs @ 12.33 hrs, Volume= 0.390 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.75' @ 12.33 hrs Surf.Area= 5,719 sf Storage= 4,005 cf

Plug-Flow detention time= 18.4 min calculated for 0.390 af (100% of inflow)
Center-of-Mass det. time= 15.7 min (827.1 - 811.4)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.40 cfs @ 12.33 hrs HW=863.75' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.40 cfs @ 3.05 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=862.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 2.75" for 10-Year Bulletin 70 event
Inflow = 75.61 cfs @ 12.44 hrs, Volume= 10.653 af
Outflow = 2.02 cfs @ 24.00 hrs, Volume= 1.792 af, Atten= 97%, Lag= 693.6 min
Primary = 2.02 cfs @ 24.00 hrs, Volume= 1.792 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 891.85' @ 24.00 hrs Surf.Area= 342,941 sf Storage= 623,637 cf (385,968 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 252.6 min (1,107.9 - 855.3)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.02 cfs @ 24.00 hrs HW=891.85' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.02 cfs @ 2.57 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 2.39" for 10-Year Bulletin 70 event
Inflow = 253.85 cfs @ 12.89 hrs, Volume= 72.555 af
Primary = 253.85 cfs @ 12.89 hrs, Volume= 72.555 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 2.41" for 10-Year Bulletin 70 event
Inflow = 260.64 cfs @ 12.88 hrs, Volume= 76.315 af
Primary = 260.64 cfs @ 12.88 hrs, Volume= 76.315 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 2.89" for 10-Year Bulletin 70 event
Inflow = 47.01 cfs @ 12.12 hrs, Volume= 3.761 af
Primary = 47.01 cfs @ 12.12 hrs, Volume= 3.761 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>3.92"
Flow Length=697' Tc=26.2 min CN=86 Runoff=31.25 cfs 2.761 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>3.94"
Flow Length=412' Tc=10.7 min CN=86 Runoff=24.74 cfs 1.414 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>4.01"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=84.41 cfs 10.618 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>4.04"
Flow Length=419' Tc=11.3 min CN=87 Runoff=11.03 cfs 0.647 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>4.03"
Tc=20.0 min CN=87 Runoff=44.94 cfs 3.419 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>3.93"
Tc=20.0 min CN=86 Runoff=55.03 cfs 4.172 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>3.89"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=137.80 cfs 21.917 af

Subcatchment 8S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>3.95"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=196.60 cfs 46.985 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>3.82"
Flow Length=838' Tc=20.0 min CN=85 Runoff=59.51 cfs 4.495 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>3.93"
Flow Length=529' Tc=15.7 min CN=86 Runoff=20.66 cfs 1.385 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>4.03"
Flow Length=696' Tc=18.7 min CN=87 Runoff=7.04 cfs 0.517 af

Subcatchment 12S: DA8-Onsite Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>3.89"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=174.47 cfs 26.056 af

Pond 1P: DA 1 Storage Peak Elev=898.96' Storage=49,133 cf Inflow=31.25 cfs 2.761 af
Outflow=20.10 cfs 1.908 af

Pond 2P: DA 2 Storage Peak Elev=897.92' Storage=28,310 cf Inflow=24.74 cfs 1.414 af
Primary=2.05 cfs 0.961 af Secondary=6.71 cfs 0.275 af Outflow=8.77 cfs 1.236 af

Pond 12P: DA 4 Storage Peak Elev=896.91' Storage=23,066 cf Inflow=15.31 cfs 1.883 af
Primary=3.32 cfs 1.854 af Secondary=0.00 cfs 0.000 af Outflow=3.32 cfs 1.854 af

Pond 13P: DA 7 Storage Peak Elev=881.62' Storage=468,012 cf Inflow=139.37 cfs 24.181 af
Primary=3.41 cfs 3.401 af Secondary=48.79 cfs 14.393 af Outflow=52.20 cfs 17.794 af

Pond 14P: DA 5 Storage Peak Elev=890.31' Storage=219,855 cf Inflow=44.94 cfs 3.419 af
Primary=3.87 cfs 2.592 af Secondary=0.00 cfs 0.000 af Outflow=3.87 cfs 2.592 af

Pond 17P: DA 6 Storage Peak Elev=889.36' Storage=161,619 cf Inflow=57.10 cfs 6.764 af
Primary=11.03 cfs 6.192 af Secondary=0.00 cfs 0.000 af Outflow=11.03 cfs 6.192 af

Pond 18P: DA 10 Storage Peak Elev=863.58' Storage=27,026 cf Inflow=20.66 cfs 1.385 af
Outflow=9.50 cfs 0.986 af

Pond 19P: DA 11 Storage Peak Elev=864.02' Storage=5,710 cf Inflow=7.04 cfs 0.517 af
Primary=2.75 cfs 0.513 af Secondary=0.20 cfs 0.002 af Outflow=2.94 cfs 0.515 af

Pond 20P: DA 3 Storage Peak Elev=892.23' Storage=765,397 cf Inflow=107.50 cfs 14.379 af
Primary=2.51 cfs 2.264 af Secondary=0.00 cfs 0.000 af Outflow=2.51 cfs 2.264 af

Link 2L: DA 8 >>> Discharge Inflow=352.13 cfs 98.012 af
Primary=352.13 cfs 98.012 af

Link 4L: Existing Discharge Inflow=360.78 cfs 103.022 af
Primary=360.78 cfs 103.022 af

Link 15L: DA 9 >>> Discharge Inflow=61.86 cfs 5.010 af
Primary=61.86 cfs 5.010 af

Total Runoff Area = 379.969 ac Runoff Volume = 124.385 af Average Runoff Depth = 3.93"
95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac

Summary for Subcatchment 1S: DA 1

Runoff = 31.25 cfs @ 12.20 hrs, Volume= 2.761 af, Depth> 3.92"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 24.74 cfs @ 12.02 hrs, Volume= 1.414 af, Depth> 3.94"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 84.41 cfs @ 12.42 hrs, Volume= 10.618 af, Depth> 4.01"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 11.03 cfs @ 12.03 hrs, Volume= 0.647 af, Depth> 4.04"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 44.94 cfs @ 12.11 hrs, Volume= 3.419 af, Depth> 4.03"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 55.03 cfs @ 12.12 hrs, Volume= 4.172 af, Depth> 3.93"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 137.80 cfs @ 12.62 hrs, Volume= 21.917 af, Depth> 3.89"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 196.60 cfs @ 13.25 hrs, Volume= 46.985 af, Depth> 3.95"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 59.51 cfs @ 12.12 hrs, Volume= 4.495 af, Depth> 3.82"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.505	78	Row crops, straight row, Good, HSG B
	9.212	85	Row crops, straight row, Good, HSG C
	1.735	89	Row crops, straight row, Good, HSG D
	14.102	85	Weighted Average
	13.452		95.39% Pervious Area
	0.650		4.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 20.66 cfs @ 12.07 hrs, Volume= 1.385 af, Depth> 3.93"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 7.04 cfs @ 12.11 hrs, Volume= 0.517 af, Depth> 4.03"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA8-Onsite

Runoff = 174.47 cfs @ 12.58 hrs, Volume= 26.056 af, Depth> 3.89"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

Area (ac)	CN	Description
37.600	89	Row crops, straight row, Good, HSG D
36.300	85	Row crops, straight row, Good, HSG C
6.400	78	Row crops, straight row, Good, HSG B
80.300	86	Weighted Average
80.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
22.2	1,200	0.0100	0.90		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
57.5	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 3.92" for 25-Year Bulletin 70 event
Inflow = 31.25 cfs @ 12.20 hrs, Volume= 2.761 af
Outflow = 20.10 cfs @ 12.39 hrs, Volume= 1.908 af, Atten= 36%, Lag= 11.7 min
Primary = 20.10 cfs @ 12.39 hrs, Volume= 1.908 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.96' @ 12.39 hrs Surf.Area= 84,374 sf Storage= 49,133 cf

Plug-Flow detention time= 164.7 min calculated for 1.908 af (69% of inflow)
Center-of-Mass det. time= 69.7 min (882.4 - 812.7)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=20.10 cfs @ 12.39 hrs HW=898.96' TW=891.10' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 20.10 cfs @ 1.01 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 3.94" for 25-Year Bulletin 70 event
Inflow = 24.74 cfs @ 12.02 hrs, Volume= 1.414 af
Outflow = 8.77 cfs @ 12.18 hrs, Volume= 1.236 af, Atten= 65%, Lag= 9.9 min
Primary = 2.05 cfs @ 12.18 hrs, Volume= 0.961 af
Routed to Pond 12P : DA 4 Storage
Secondary = 6.71 cfs @ 12.18 hrs, Volume= 0.275 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.92' @ 12.18 hrs Surf.Area= 44,305 sf Storage= 28,310 cf

Plug-Flow detention time= 177.3 min calculated for 1.236 af (87% of inflow)
Center-of-Mass det. time= 117.6 min (918.2 - 800.5)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=2.05 cfs @ 12.18 hrs HW=897.92' TW=896.52' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.05 cfs @ 3.57 fps)

Secondary OutFlow Max=6.71 cfs @ 12.18 hrs HW=897.92' TW=896.52' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 6.71 cfs @ 1.01 fps)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 3.63" for 25-Year Bulletin 70 event
Inflow = 15.31 cfs @ 12.09 hrs, Volume= 1.883 af
Outflow = 3.32 cfs @ 12.91 hrs, Volume= 1.854 af, Atten= 78%, Lag= 48.8 min
Primary = 3.32 cfs @ 12.91 hrs, Volume= 1.854 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 896.91' @ 12.91 hrs Surf.Area= 24,745 sf Storage= 23,066 cf

Plug-Flow detention time= 71.6 min calculated for 1.854 af (98% of inflow)
Center-of-Mass det. time= 62.9 min (939.8 - 876.8)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.32 cfs @ 12.91 hrs HW=896.91' TW=891.63' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.32 cfs @ 4.23 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 2.54" for 25-Year Bulletin 70 event
Inflow = 139.37 cfs @ 12.63 hrs, Volume= 24.181 af
Outflow = 52.20 cfs @ 13.49 hrs, Volume= 17.794 af, Atten= 63%, Lag= 51.6 min
Primary = 3.41 cfs @ 13.49 hrs, Volume= 3.401 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 48.79 cfs @ 13.49 hrs, Volume= 14.393 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.62' @ 13.49 hrs Surf.Area= 444,282 sf Storage= 468,012 cf

Plug-Flow detention time= 203.0 min calculated for 17.794 af (74% of inflow)
Center-of-Mass det. time= 103.4 min (968.9 - 865.5)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.41 cfs @ 13.49 hrs HW=881.62' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.41 cfs @ 4.34 fps)

Secondary OutFlow Max=48.79 cfs @ 13.49 hrs HW=881.62' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 48.79 cfs @ 2.13 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 4.03" for 25-Year Bulletin 70 event
Inflow = 44.94 cfs @ 12.11 hrs, Volume= 3.419 af
Outflow = 3.87 cfs @ 14.39 hrs, Volume= 2.592 af, Atten= 91%, Lag= 136.4 min
Primary = 3.87 cfs @ 14.39 hrs, Volume= 2.592 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 890.31' @ 13.15 hrs Surf.Area= 104,259 sf Storage= 219,855 cf (88,937 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 205.2 min (1,009.9 - 804.7)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.87 cfs @ 14.39 hrs HW=890.26' TW=889.01' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.87 cfs @ 4.62 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 3.54" for 25-Year Bulletin 70 event
Inflow = 57.10 cfs @ 12.12 hrs, Volume= 6.764 af
Outflow = 11.03 cfs @ 12.74 hrs, Volume= 6.192 af, Atten= 81%, Lag= 37.3 min
Primary = 11.03 cfs @ 12.74 hrs, Volume= 6.192 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 889.36' @ 12.74 hrs Surf.Area= 59,572 sf Storage= 161,619 cf (94,105 cf above start)

Plug-Flow detention time= 285.4 min calculated for 4.642 af (69% of inflow)
Center-of-Mass det. time= 89.3 min (974.6 - 885.3)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=11.03 cfs @ 12.74 hrs HW=889.36' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 11.03 cfs @ 6.24 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 3.93" for 25-Year Bulletin 70 event
Inflow = 20.66 cfs @ 12.07 hrs, Volume= 1.385 af
Outflow = 9.50 cfs @ 12.25 hrs, Volume= 0.986 af, Atten= 54%, Lag= 10.9 min
Primary = 9.50 cfs @ 12.25 hrs, Volume= 0.986 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.58' @ 12.25 hrs Surf.Area= 63,601 sf Storage= 27,026 cf

Plug-Flow detention time= 166.0 min calculated for 0.985 af (71% of inflow)
Center-of-Mass det. time= 72.5 min (876.9 - 804.4)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.50 cfs @ 12.25 hrs HW=863.58' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 9.50 cfs @ 1.06 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 4.03" for 25-Year Bulletin 70 event
Inflow = 7.04 cfs @ 12.11 hrs, Volume= 0.517 af
Outflow = 2.94 cfs @ 12.34 hrs, Volume= 0.515 af, Atten= 58%, Lag= 13.8 min
Primary = 2.75 cfs @ 12.34 hrs, Volume= 0.513 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.20 cfs @ 12.34 hrs, Volume= 0.002 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.02' @ 12.34 hrs Surf.Area= 7,145 sf Storage= 5,710 cf

Plug-Flow detention time= 20.7 min calculated for 0.515 af (100% of inflow)
Center-of-Mass det. time= 18.2 min (821.9 - 803.7)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.75 cfs @ 12.34 hrs HW=864.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.75 cfs @ 3.50 fps)

Secondary OutFlow Max=0.20 cfs @ 12.34 hrs HW=864.02' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.20 cfs @ 0.37 fps)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 3.71" for 25-Year Bulletin 70 event
Inflow = 107.50 cfs @ 12.42 hrs, Volume= 14.379 af
Outflow = 2.51 cfs @ 24.00 hrs, Volume= 2.264 af, Atten= 98%, Lag= 695.0 min
Primary = 2.51 cfs @ 24.00 hrs, Volume= 2.264 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.23' @ 24.00 hrs Surf.Area= 390,972 sf Storage= 765,397 cf (527,728 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 256.9 min (1,103.7 - 846.8)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.51 cfs @ 24.00 hrs HW=892.23' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.51 cfs @ 3.19 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 3.23" for 25-Year Bulletin 70 event
Inflow = 352.13 cfs @ 12.89 hrs, Volume= 98.012 af
Primary = 352.13 cfs @ 12.89 hrs, Volume= 98.012 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 3.25" for 25-Year Bulletin 70 event
Inflow = 360.78 cfs @ 12.89 hrs, Volume= 103.022 af
Primary = 360.78 cfs @ 12.89 hrs, Volume= 103.022 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 3.84" for 25-Year Bulletin 70 event
Inflow = 61.86 cfs @ 12.12 hrs, Volume= 5.010 af
Primary = 61.86 cfs @ 12.12 hrs, Volume= 5.010 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>4.82"
Flow Length=697' Tc=26.2 min CN=86 Runoff=38.09 cfs 3.393 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>4.84"
Flow Length=412' Tc=10.7 min CN=86 Runoff=30.07 cfs 1.737 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>4.91"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=102.67 cfs 13.004 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>4.95"
Flow Length=419' Tc=11.3 min CN=87 Runoff=13.36 cfs 0.793 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>4.94"
Tc=20.0 min CN=87 Runoff=54.55 cfs 4.186 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>4.83"
Tc=20.0 min CN=86 Runoff=67.13 cfs 5.127 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>4.78"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=168.55 cfs 26.943 af

Subcatchment 8S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>4.84"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=239.57 cfs 57.572 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>4.72"
Flow Length=838' Tc=20.0 min CN=85 Runoff=72.90 cfs 5.544 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>4.83"
Flow Length=529' Tc=15.7 min CN=86 Runoff=25.14 cfs 1.702 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>4.94"
Flow Length=696' Tc=18.7 min CN=87 Runoff=8.54 cfs 0.633 af

Subcatchment 12S: DA8-Onsite Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>4.79"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=213.21 cfs 32.029 af

Pond 1P: DA 1 Storage Peak Elev=899.00' Storage=53,153 cf Inflow=38.09 cfs 3.393 af
Outflow=29.25 cfs 2.537 af

Pond 2P: DA 2 Storage Peak Elev=898.00' Storage=32,031 cf Inflow=30.07 cfs 1.737 af
Primary=2.30 cfs 1.023 af Secondary=12.34 cfs 0.518 af Outflow=14.64 cfs 1.541 af

Pond 12P: DA 4 Storage Peak Elev=897.30' Storage=34,168 cf Inflow=24.00 cfs 2.334 af
Primary=3.68 cfs 2.300 af Secondary=0.00 cfs 0.000 af Outflow=3.68 cfs 2.300 af

Pond 13P: DA 7 Storage Peak Elev=881.78' Storage=543,354 cf Inflow=170.27 cfs 29.559 af
Primary=3.55 cfs 3.587 af Secondary=68.94 cfs 19.418 af Outflow=72.49 cfs 23.005 af

Pond 14P: DA 5 Storage Peak Elev=890.51' Storage=241,588 cf Inflow=54.55 cfs 4.186 af
Primary=4.37 cfs 3.223 af Secondary=0.00 cfs 0.000 af Outflow=4.37 cfs 3.223 af

Pond 17P: DA 6 Storage Peak Elev=889.70' Storage=185,205 cf Inflow=69.84 cfs 8.349 af
Primary=12.10 cfs 7.700 af Secondary=0.00 cfs 0.000 af Outflow=12.10 cfs 7.700 af

Pond 18P: DA 10 Storage Peak Elev=863.63' Storage=30,610 cf Inflow=25.14 cfs 1.702 af
Outflow=14.24 cfs 1.300 af

Pond 19P: DA 11 Storage Peak Elev=864.12' Storage=6,451 cf Inflow=8.54 cfs 0.633 af
Primary=2.86 cfs 0.591 af Secondary=2.45 cfs 0.039 af Outflow=5.31 cfs 0.631 af

Pond 20P: DA 3 Storage Peak Elev=892.56' Storage=900,834 cf Inflow=133.86 cfs 17.841 af
Primary=2.86 cfs 2.616 af Secondary=0.00 cfs 0.000 af Outflow=2.86 cfs 2.616 af

Link 2L: DA 8 >>> Discharge Inflow=444.52 cfs 121.606 af
Primary=444.52 cfs 121.606 af

Link 4L: Existing Discharge Inflow=454.67 cfs 127.781 af
Primary=454.67 cfs 127.781 af

Link 15L: DA 9 >>> Discharge Inflow=75.41 cfs 6.174 af
Primary=75.41 cfs 6.174 af

Total Runoff Area = 379.969 ac Runoff Volume = 152.662 af Average Runoff Depth = 4.82"
95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac

Summary for Subcatchment 1S: DA 1

Runoff = 38.09 cfs @ 12.19 hrs, Volume= 3.393 af, Depth> 4.82"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 30.07 cfs @ 12.02 hrs, Volume= 1.737 af, Depth> 4.84"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 102.67 cfs @ 12.42 hrs, Volume= 13.004 af, Depth> 4.91"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 13.36 cfs @ 12.02 hrs, Volume= 0.793 af, Depth> 4.95"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 54.55 cfs @ 12.11 hrs, Volume= 4.186 af, Depth> 4.94"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 67.13 cfs @ 12.11 hrs, Volume= 5.127 af, Depth> 4.83"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 168.55 cfs @ 12.62 hrs, Volume= 26.943 af, Depth> 4.78"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 239.57 cfs @ 13.25 hrs, Volume= 57.572 af, Depth> 4.84"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 72.90 cfs @ 12.11 hrs, Volume= 5.544 af, Depth> 4.72"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.505	78	Row crops, straight row, Good, HSG B
	9.212	85	Row crops, straight row, Good, HSG C
	1.735	89	Row crops, straight row, Good, HSG D
	14.102	85	Weighted Average
	13.452		95.39% Pervious Area
	0.650		4.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 25.14 cfs @ 12.07 hrs, Volume= 1.702 af, Depth> 4.83"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 8.54 cfs @ 12.11 hrs, Volume= 0.633 af, Depth> 4.94"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA8-Onsite

Runoff = 213.21 cfs @ 12.58 hrs, Volume= 32.029 af, Depth> 4.79"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

Area (ac)	CN	Description
37.600	89	Row crops, straight row, Good, HSG D
36.300	85	Row crops, straight row, Good, HSG C
6.400	78	Row crops, straight row, Good, HSG B
80.300	86	Weighted Average
80.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
22.2	1,200	0.0100	0.90		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
57.5	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 4.82" for 50-Year Bulletin 70 event
Inflow = 38.09 cfs @ 12.19 hrs, Volume= 3.393 af
Outflow = 29.25 cfs @ 12.34 hrs, Volume= 2.537 af, Atten= 23%, Lag= 8.5 min
Primary = 29.25 cfs @ 12.34 hrs, Volume= 2.537 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 899.00' @ 12.34 hrs Surf.Area= 87,640 sf Storage= 53,153 cf

Plug-Flow detention time= 146.8 min calculated for 2.537 af (75% of inflow)
Center-of-Mass det. time= 59.8 min (866.8 - 807.0)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=29.24 cfs @ 12.34 hrs HW=899.00' TW=891.21' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 29.24 cfs @ 1.15 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 4.84" for 50-Year Bulletin 70 event
Inflow = 30.07 cfs @ 12.02 hrs, Volume= 1.737 af
Outflow = 14.64 cfs @ 12.15 hrs, Volume= 1.541 af, Atten= 51%, Lag= 7.6 min
Primary = 2.30 cfs @ 12.15 hrs, Volume= 1.023 af
Routed to Pond 12P : DA 4 Storage
Secondary = 12.34 cfs @ 12.15 hrs, Volume= 0.518 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.00' @ 12.15 hrs Surf.Area= 46,697 sf Storage= 32,031 cf

Plug-Flow detention time= 160.9 min calculated for 1.540 af (89% of inflow)
Center-of-Mass det. time= 105.8 min (900.5 - 794.8)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=2.30 cfs @ 12.15 hrs HW=898.00' TW=896.74' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.30 cfs @ 3.64 fps)

Secondary OutFlow Max=12.33 cfs @ 12.15 hrs HW=898.00' TW=896.74' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 12.33 cfs @ 1.25 fps)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 4.49" for 50-Year Bulletin 70 event
Inflow = 24.00 cfs @ 12.09 hrs, Volume= 2.334 af
Outflow = 3.68 cfs @ 12.95 hrs, Volume= 2.300 af, Atten= 85%, Lag= 51.7 min
Primary = 3.68 cfs @ 12.95 hrs, Volume= 2.300 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.30' @ 12.95 hrs Surf.Area= 33,056 sf Storage= 34,168 cf

Plug-Flow detention time= 92.8 min calculated for 2.299 af (98% of inflow)
Center-of-Mass det. time= 84.6 min (948.3 - 863.8)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.68 cfs @ 12.95 hrs HW=897.30' TW=891.91' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.68 cfs @ 4.69 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 3.11" for 50-Year Bulletin 70 event
Inflow = 170.27 cfs @ 12.62 hrs, Volume= 29.559 af
Outflow = 72.49 cfs @ 13.38 hrs, Volume= 23.005 af, Atten= 57%, Lag= 45.4 min
Primary = 3.55 cfs @ 13.38 hrs, Volume= 3.587 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 68.94 cfs @ 13.38 hrs, Volume= 19.418 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.78' @ 13.38 hrs Surf.Area= 483,711 sf Storage= 543,354 cf

Plug-Flow detention time= 183.6 min calculated for 22.995 af (78% of inflow)
Center-of-Mass det. time= 94.4 min (953.0 - 858.7)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.55 cfs @ 13.38 hrs HW=881.78' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.55 cfs @ 4.52 fps)

Secondary OutFlow Max=68.94 cfs @ 13.38 hrs HW=881.78' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 68.94 cfs @ 2.38 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 4.94" for 50-Year Bulletin 70 event
Inflow = 54.55 cfs @ 12.11 hrs, Volume= 4.186 af
Outflow = 4.37 cfs @ 15.31 hrs, Volume= 3.223 af, Atten= 92%, Lag= 191.7 min
Primary = 4.37 cfs @ 15.31 hrs, Volume= 3.223 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 890.51' @ 13.24 hrs Surf.Area= 113,268 sf Storage= 241,588 cf (110,670 cf above start)

Plug-Flow detention time= 902.5 min calculated for 0.217 af (5% of inflow)
Center-of-Mass det. time= 217.3 min (1,016.4 - 799.1)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.37 cfs @ 15.31 hrs HW=890.40' TW=889.22' (Dynamic Tailwater)
1=Culvert (Outlet Controls 4.37 cfs @ 4.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 4.37" for 50-Year Bulletin 70 event
Inflow = 69.84 cfs @ 12.12 hrs, Volume= 8.349 af
Outflow = 12.10 cfs @ 12.79 hrs, Volume= 7.700 af, Atten= 83%, Lag= 40.5 min
Primary = 12.10 cfs @ 12.79 hrs, Volume= 7.700 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 889.70' @ 12.79 hrs Surf.Area= 78,590 sf Storage= 185,205 cf (117,691 cf above start)

Plug-Flow detention time= 268.2 min calculated for 6.148 af (74% of inflow)
Center-of-Mass det. time= 97.4 min (982.2 - 884.8)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=12.10 cfs @ 12.79 hrs HW=889.70' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 12.10 cfs @ 6.84 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 4.83" for 50-Year Bulletin 70 event
Inflow = 25.14 cfs @ 12.07 hrs, Volume= 1.702 af
Outflow = 14.24 cfs @ 12.22 hrs, Volume= 1.300 af, Atten= 43%, Lag= 8.8 min
Primary = 14.24 cfs @ 12.22 hrs, Volume= 1.300 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.63' @ 12.22 hrs Surf.Area= 66,823 sf Storage= 30,610 cf

Plug-Flow detention time= 149.1 min calculated for 1.300 af (76% of inflow)
Center-of-Mass det. time= 63.5 min (862.3 - 798.7)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=14.24 cfs @ 12.22 hrs HW=863.63' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 14.24 cfs @ 1.21 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 4.94" for 50-Year Bulletin 70 event
Inflow = 8.54 cfs @ 12.11 hrs, Volume= 0.633 af
Outflow = 5.31 cfs @ 12.26 hrs, Volume= 0.631 af, Atten= 38%, Lag= 9.0 min
Primary = 2.86 cfs @ 12.26 hrs, Volume= 0.591 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 2.45 cfs @ 12.26 hrs, Volume= 0.039 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.12' @ 12.26 hrs Surf.Area= 8,161 sf Storage= 6,451 cf

Plug-Flow detention time= 19.9 min calculated for 0.630 af (100% of inflow)
Center-of-Mass det. time= 17.5 min (815.6 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.86 cfs @ 12.26 hrs HW=864.12' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.86 cfs @ 3.64 fps)

Secondary OutFlow Max=2.45 cfs @ 12.26 hrs HW=864.12' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.45 cfs @ 0.86 fps)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 4.61" for 50-Year Bulletin 70 event
Inflow = 133.86 cfs @ 12.38 hrs, Volume= 17.841 af
Outflow = 2.86 cfs @ 24.00 hrs, Volume= 2.616 af, Atten= 98%, Lag= 697.1 min
Primary = 2.86 cfs @ 24.00 hrs, Volume= 2.616 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.56' @ 24.00 hrs Surf.Area= 431,900 sf Storage= 900,834 cf (663,164 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 256.8 min (1,099.0 - 842.2)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.86 cfs @ 24.00 hrs HW=892.56' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.86 cfs @ 3.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 4.01" for 50-Year Bulletin 70 event
Inflow = 444.52 cfs @ 12.89 hrs, Volume= 121.606 af
Primary = 444.52 cfs @ 12.89 hrs, Volume= 121.606 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 4.04" for 50-Year Bulletin 70 event
Inflow = 454.67 cfs @ 12.88 hrs, Volume= 127.781 af
Primary = 454.67 cfs @ 12.88 hrs, Volume= 127.781 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 4.74" for 50-Year Bulletin 70 event
Inflow = 75.41 cfs @ 12.12 hrs, Volume= 6.174 af
Primary = 75.41 cfs @ 12.12 hrs, Volume= 6.174 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>5.89"
Flow Length=697' Tc=26.2 min CN=86 Runoff=46.16 cfs 4.148 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>5.91"
Flow Length=412' Tc=10.7 min CN=86 Runoff=36.33 cfs 2.123 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>5.98"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=124.15 cfs 15.848 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>6.03"
Flow Length=419' Tc=11.3 min CN=87 Runoff=16.10 cfs 0.966 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>6.02"
Tc=20.0 min CN=87 Runoff=65.84 cfs 5.101 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>5.90"
Tc=20.0 min CN=86 Runoff=81.30 cfs 6.266 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>5.85"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=204.74 cfs 32.941 af

Subcatchment 8S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>5.90"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=290.16 cfs 70.192 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 4.61% Impervious Runoff Depth>5.78"
Flow Length=838' Tc=20.0 min CN=85 Runoff=88.60 cfs 6.797 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>5.91"
Flow Length=529' Tc=15.7 min CN=86 Runoff=30.42 cfs 2.080 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>6.02"
Flow Length=696' Tc=18.7 min CN=87 Runoff=10.31 cfs 0.771 af

Subcatchment 12S: DA8-Onsite Runoff Area=80.300 ac 0.00% Impervious Runoff Depth>5.85"
Flow Length=1,500' Slope=0.0100 '/' Tc=57.5 min CN=86 Runoff=258.85 cfs 39.159 af

Pond 1P: DA 1 Storage Peak Elev=899.05' Storage=57,060 cf Inflow=46.16 cfs 4.148 af
Outflow=38.95 cfs 3.288 af

Pond 2P: DA 2 Storage Peak Elev=898.08' Storage=35,839 cf Inflow=36.33 cfs 2.123 af
Primary=2.51 cfs 1.032 af Secondary=18.97 cfs 0.871 af Outflow=21.48 cfs 1.904 af

Pond 12P: DA 4 Storage Peak Elev=897.66' Storage=47,765 cf Inflow=34.01 cfs 2.870 af
Primary=3.99 cfs 2.829 af Secondary=0.00 cfs 0.000 af Outflow=3.99 cfs 2.829 af

Pond 13P: DA 7 Storage Peak Elev=881.96' Storage=632,165 cf Inflow=206.85 cfs 35.908 af
Primary=3.69 cfs 3.789 af Secondary=93.12 cfs 25.390 af Outflow=96.82 cfs 29.179 af

Pond 14P: DA 5 Storage Peak Elev=890.73' Storage=268,433 cf Inflow=65.84 cfs 5.101 af
Primary=4.87 cfs 3.935 af Secondary=0.00 cfs 0.000 af Outflow=4.87 cfs 3.935 af

Pond 17P: DA 6 Storage Peak Elev=890.02' Storage=213,410 cf Inflow=84.59 cfs 10.202 af
Primary=13.02 cfs 9.431 af Secondary=0.35 cfs 0.010 af Outflow=13.37 cfs 9.441 af

Pond 18P: DA 10 Storage Peak Elev=863.69' Storage=34,315 cf Inflow=30.42 cfs 2.080 af
Outflow=19.59 cfs 1.676 af

Pond 19P: DA 11 Storage Peak Elev=864.19' Storage=7,032 cf Inflow=10.31 cfs 0.771 af
Primary=2.94 cfs 0.676 af Secondary=4.84 cfs 0.093 af Outflow=7.78 cfs 0.769 af

Pond 20P: DA 3 Storage Peak Elev=892.92' Storage=1,065,249 cf Inflow=163.66 cfs 21.965 af
Primary=3.20 cfs 2.966 af Secondary=0.00 cfs 0.000 af Outflow=3.20 cfs 2.966 af

Link 2L: DA 8 >>> Discharge Inflow=551.74 cfs 149.647 af
Primary=551.74 cfs 149.647 af

Link 4L: Existing Discharge Inflow=563.58 cfs 157.213 af
Primary=563.58 cfs 157.213 af

Link 15L: DA 9 >>> Discharge Inflow=93.14 cfs 7.566 af
Primary=93.14 cfs 7.566 af

Total Runoff Area = 379.969 ac Runoff Volume = 186.393 af Average Runoff Depth = 5.89"
95.78% Pervious = 363.934 ac 4.22% Impervious = 16.034 ac

Summary for Subcatchment 1S: DA 1

Runoff = 46.16 cfs @ 12.19 hrs, Volume= 4.148 af, Depth> 5.89"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 36.33 cfs @ 12.02 hrs, Volume= 2.123 af, Depth> 5.91"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 124.15 cfs @ 12.42 hrs, Volume= 15.848 af, Depth> 5.98"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 16.10 cfs @ 12.02 hrs, Volume= 0.966 af, Depth> 6.03"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 65.84 cfs @ 12.11 hrs, Volume= 5.101 af, Depth> 6.02"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 81.30 cfs @ 12.11 hrs, Volume= 6.266 af, Depth> 5.90"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 204.74 cfs @ 12.62 hrs, Volume= 32.941 af, Depth> 5.85"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 8S: DA 8 - Offsite

Runoff = 290.16 cfs @ 13.25 hrs, Volume= 70.192 af, Depth> 5.90"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 88.60 cfs @ 12.11 hrs, Volume= 6.797 af, Depth> 5.78"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.505	78	Row crops, straight row, Good, HSG B
	9.212	85	Row crops, straight row, Good, HSG C
	1.735	89	Row crops, straight row, Good, HSG D
	14.102	85	Weighted Average
	13.452		95.39% Pervious Area
	0.650		4.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 30.42 cfs @ 12.07 hrs, Volume= 2.080 af, Depth> 5.91"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 10.31 cfs @ 12.11 hrs, Volume= 0.771 af, Depth> 6.02"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA8-Onsite

Runoff = 258.85 cfs @ 12.58 hrs, Volume= 39.159 af, Depth> 5.85"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

Area (ac)	CN	Description
37.600	89	Row crops, straight row, Good, HSG D
36.300	85	Row crops, straight row, Good, HSG C
6.400	78	Row crops, straight row, Good, HSG B
80.300	86	Weighted Average
80.300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
22.2	1,200	0.0100	0.90		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
57.5	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 5.89" for 100-Year Bulletin 70 event
Inflow = 46.16 cfs @ 12.19 hrs, Volume= 4.148 af
Outflow = 38.95 cfs @ 12.30 hrs, Volume= 3.288 af, Atten= 16%, Lag= 6.6 min
Primary = 38.95 cfs @ 12.30 hrs, Volume= 3.288 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 899.05' @ 12.30 hrs Surf.Area= 91,471 sf Storage= 57,060 cf

Plug-Flow detention time= 132.5 min calculated for 3.288 af (79% of inflow)
Center-of-Mass det. time= 53.6 min (855.1 - 801.5)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=38.94 cfs @ 12.30 hrs HW=899.05' TW=891.36' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 38.94 cfs @ 1.27 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 5.91" for 100-Year Bulletin 70 event
Inflow = 36.33 cfs @ 12.02 hrs, Volume= 2.123 af
Outflow = 21.48 cfs @ 12.12 hrs, Volume= 1.904 af, Atten= 41%, Lag= 6.3 min
Primary = 2.51 cfs @ 12.12 hrs, Volume= 1.032 af
Routed to Pond 12P : DA 4 Storage
Secondary = 18.97 cfs @ 12.12 hrs, Volume= 0.871 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.08' @ 12.12 hrs Surf.Area= 48,783 sf Storage= 35,839 cf

Plug-Flow detention time= 149.3 min calculated for 1.903 af (90% of inflow)
Center-of-Mass det. time= 97.6 min (886.9 - 789.2)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=2.51 cfs @ 12.12 hrs HW=898.08' TW=897.00' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.51 cfs @ 3.70 fps)

Secondary OutFlow Max=18.96 cfs @ 12.12 hrs HW=898.08' TW=897.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 18.96 cfs @ 1.45 fps)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 5.52" for 100-Year Bulletin 70 event
Inflow = 34.01 cfs @ 12.08 hrs, Volume= 2.870 af
Outflow = 3.99 cfs @ 13.01 hrs, Volume= 2.829 af, Atten= 88%, Lag= 55.8 min
Primary = 3.99 cfs @ 13.01 hrs, Volume= 2.829 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.66' @ 13.01 hrs Surf.Area= 41,654 sf Storage= 47,765 cf

Plug-Flow detention time= 118.5 min calculated for 2.829 af (99% of inflow)
Center-of-Mass det. time= 110.4 min (963.6 - 853.2)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.99 cfs @ 13.01 hrs HW=897.66' TW=892.23' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.99 cfs @ 5.08 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 3.78" for 100-Year Bulletin 70 event
Inflow = 206.85 cfs @ 12.62 hrs, Volume= 35.908 af
Outflow = 96.82 cfs @ 13.30 hrs, Volume= 29.179 af, Atten= 53%, Lag= 40.8 min
Primary = 3.69 cfs @ 13.30 hrs, Volume= 3.789 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 93.12 cfs @ 13.30 hrs, Volume= 25.390 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.96' @ 13.30 hrs Surf.Area= 526,409 sf Storage= 632,165 cf

Plug-Flow detention time= 168.3 min calculated for 29.179 af (81% of inflow)
Center-of-Mass det. time= 88.3 min (940.1 - 851.8)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.69 cfs @ 13.30 hrs HW=881.96' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.69 cfs @ 4.70 fps)

Secondary OutFlow Max=93.12 cfs @ 13.30 hrs HW=881.96' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 93.12 cfs @ 2.63 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 6.02" for 100-Year Bulletin 70 event
Inflow = 65.84 cfs @ 12.11 hrs, Volume= 5.101 af
Outflow = 4.87 cfs @ 16.29 hrs, Volume= 3.935 af, Atten= 93%, Lag= 250.8 min
Primary = 4.87 cfs @ 16.29 hrs, Volume= 3.935 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.18' Surf.Area= 53,391 sf Storage= 130,918 cf
Peak Elev= 890.73' @ 13.44 hrs Surf.Area= 123,492 sf Storage= 268,433 cf (137,515 cf above start)

Plug-Flow detention time= 699.9 min calculated for 0.929 af (18% of inflow)
Center-of-Mass det. time= 236.0 min (1,029.7 - 793.7)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.88 cfs @ 16.29 hrs HW=890.56' TW=889.42' (Dynamic Tailwater)
1=Culvert (Outlet Controls 4.88 cfs @ 4.50 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.18' TW=886.93' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 5.34" for 100-Year Bulletin 70 event
Inflow = 84.59 cfs @ 12.11 hrs, Volume= 10.202 af
Outflow = 13.37 cfs @ 12.83 hrs, Volume= 9.441 af, Atten= 84%, Lag= 42.7 min
Primary = 13.02 cfs @ 12.83 hrs, Volume= 9.431 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.35 cfs @ 12.83 hrs, Volume= 0.010 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 890.02' @ 12.83 hrs Surf.Area= 96,532 sf Storage= 213,410 cf (145,896 cf above start)

Plug-Flow detention time= 261.6 min calculated for 7.888 af (77% of inflow)
Center-of-Mass det. time= 107.9 min (994.4 - 886.5)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=13.02 cfs @ 12.83 hrs HW=890.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 13.02 cfs @ 7.37 fps)

Secondary OutFlow Max=0.35 cfs @ 12.83 hrs HW=890.02' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.35 cfs @ 0.38 fps)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 5.91" for 100-Year Bulletin 70 event
Inflow = 30.42 cfs @ 12.07 hrs, Volume= 2.080 af
Outflow = 19.59 cfs @ 12.20 hrs, Volume= 1.676 af, Atten= 36%, Lag= 7.6 min
Primary = 19.59 cfs @ 12.20 hrs, Volume= 1.676 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.69' @ 12.20 hrs Surf.Area= 69,998 sf Storage= 34,315 cf

Plug-Flow detention time= 135.0 min calculated for 1.675 af (81% of inflow)
Center-of-Mass det. time= 57.9 min (851.1 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=19.58 cfs @ 12.20 hrs HW=863.69' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 19.58 cfs @ 1.36 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 6.02" for 100-Year Bulletin 70 event
Inflow = 10.31 cfs @ 12.11 hrs, Volume= 0.771 af
Outflow = 7.78 cfs @ 12.22 hrs, Volume= 0.769 af, Atten= 24%, Lag= 6.6 min
Primary = 2.94 cfs @ 12.22 hrs, Volume= 0.676 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 4.84 cfs @ 12.22 hrs, Volume= 0.093 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.19' @ 12.22 hrs Surf.Area= 8,878 sf Storage= 7,032 cf

Plug-Flow detention time= 18.7 min calculated for 0.768 af (100% of inflow)
Center-of-Mass det. time= 16.5 min (809.2 - 792.7)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.94 cfs @ 12.22 hrs HW=864.19' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.94 cfs @ 3.74 fps)

Secondary OutFlow Max=4.84 cfs @ 12.22 hrs HW=864.19' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 4.84 cfs @ 1.08 fps)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 5.67" for 100-Year Bulletin 70 event
Inflow = 163.66 cfs @ 12.37 hrs, Volume= 21.965 af
Outflow = 3.20 cfs @ 24.00 hrs, Volume= 2.966 af, Atten= 98%, Lag= 697.6 min
Primary = 3.20 cfs @ 24.00 hrs, Volume= 2.966 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.92' @ 24.00 hrs Surf.Area= 476,888 sf Storage= 1,065,249 cf (827,579 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 254.9 min (1,093.8 - 839.0)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.20 cfs @ 24.00 hrs HW=892.92' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.20 cfs @ 4.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.14% Impervious, Inflow Depth > 4.93" for 100-Year Bulletin 70 event
Inflow = 551.74 cfs @ 12.88 hrs, Volume= 149.647 af
Primary = 551.74 cfs @ 12.88 hrs, Volume= 149.647 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Existing Discharge

Inflow Area = 379.969 ac, 4.22% Impervious, Inflow Depth > 4.97" for 100-Year Bulletin 70 event
Inflow = 563.58 cfs @ 12.88 hrs, Volume= 157.213 af
Primary = 563.58 cfs @ 12.88 hrs, Volume= 157.213 af, Atten= 0%, Lag= 0.0 min

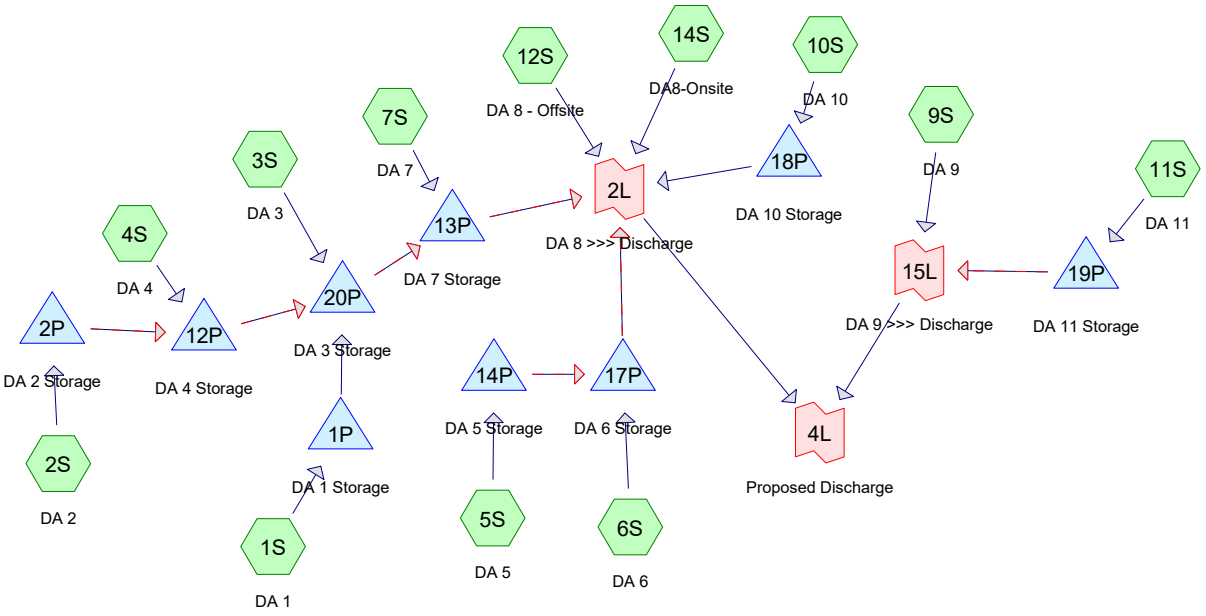
Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 6.01% Impervious, Inflow Depth > 5.81" for 100-Year Bulletin 70 event
Inflow = 93.14 cfs @ 12.13 hrs, Volume= 7.566 af
Primary = 93.14 cfs @ 12.13 hrs, Volume= 7.566 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Existing Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for Cortland Solar Proposed
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year Bulletin 70	Type II 24-hr		Default	24.00	1	3.04	2
2	10-Year Bulletin 70	Type II 24-hr		Default	24.00	1	4.47	2
3	25-Year Bulletin 70	Type II 24-hr		Default	24.00	1	5.51	2
4	50-Year Bulletin 70	Type II 24-hr		Default	24.00	1	6.46	2
5	100-Year Bulletin 70	Type II 24-hr		Default	24.00	1	7.58	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
13.139	80	1/2 acre lots, 25% imp, HSG C (5S, 6S, 7S, 12S)
4.319	85	1/2 acre lots, 25% imp, HSG D (5S, 6S, 7S, 12S)
7.700	98	EX Imp (2S, 3S, 4S, 5S, 6S, 7S, 9S, 11S)
3.970	98	Ex Imp (12S)
1.100	58	Meadow, non-grazed, HSG B (14S)
9.905	71	Meadow, non-grazed, HSG C (9S, 14S)
23.130	78	Meadow, non-grazed, HSG D (14S)
3.593	79	Pasture/grassland/range, Fair, HSG C (7S, 12S)
3.079	84	Pasture/grassland/range, Fair, HSG D (7S, 12S)
0.355	98	Prop Imp (9S)
0.600	98	Proposed Impervious (14S)
7.751	78	Row crops, straight row, Good, HSG B (9S, 14S)
188.600	85	Row crops, straight row, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 14S)
112.728	89	Row crops, straight row, Good, HSG D (1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 14S)
379.969	**85**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
8.851	HSG B	9S, 14S
215.237	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 14S
143.256	HSG D	1S, 2S, 3S, 4S, 5S, 6S, 7S, 9S, 10S, 11S, 12S, 14S
12.625	Other	2S, 3S, 4S, 5S, 6S, 7S, 9S, 11S, 12S, 14S
379.969		**TOTAL AREA**

Cortland Solar Proposed
Prepared by WSB & Associates Inc
Printed 10/15/2025
HydroCAD® 10.20-7a s/n 00883 © 2025 HydroCAD Software Solutions LLC

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchme Numbers
0.000	0.000	13.139	4.319	0.000	17.458	1/2 acre lots, 25% imp	
0.000	0.000	0.000	0.000	7.700	7.700	EX Imp	
0.000	0.000	0.000	0.000	3.970	3.970	Ex Imp	
0.000	1.100	9.905	23.130	0.000	34.135	Meadow, non-grazed	
0.000	0.000	3.593	3.079	0.000	6.672	Pasture/grassland/range, Fair	
0.000	0.000	0.000	0.000	0.355	0.355	Prop Imp	
0.000	0.000	0.000	0.000	0.600	0.600	Proposed Impervious	
0.000	7.751	188.600	112.728	0.000	309.079	Row crops, straight row, Good	
0.000	**8.851**	**215.237**	**143.256**	**12.625**	**379.969**	**TOTAL AREA**	

Cortland Solar Proposed
Prepared by WSB & Associates Inc
Printed 10/15/2025
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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Nod Nam
1	2P	897.00	896.25	37.0	0.0203	0.025	0.0	12.0	0.0	
2	12P	895.00	894.20	40.0	0.0200	0.025	0.0	12.0	0.0	
3	13P	879.00	878.65	45.0	0.0078	0.025	0.0	12.0	0.0	
4	14P	889.18	888.20	138.0	0.0071	0.012	0.0	15.0	0.0	
5	17P	886.93	884.76	63.0	0.0344	0.012	0.0	18.0	0.0	
6	19P	862.00	861.90	38.0	0.0026	0.025	0.0	12.0	0.0	
7	20P	890.27	890.13	47.0	0.0030	0.025	0.0	12.0	0.0	

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>1.69"
Flow Length=697' Tc=26.2 min CN=86 Runoff=13.61 cfs 1.186 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>1.69"
Flow Length=412' Tc=10.7 min CN=86 Runoff=10.97 cfs 0.608 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>1.75"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=37.30 cfs 4.644 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>1.77"
Flow Length=419' Tc=11.3 min CN=87 Runoff=4.99 cfs 0.283 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>1.77"
Tc=20.0 min CN=87 Runoff=20.07 cfs 1.497 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>1.69"
Tc=20.0 min CN=86 Runoff=24.06 cfs 1.793 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>1.67"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=59.45 cfs 9.403 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>1.61"
Flow Length=838' Tc=20.0 min CN=85 Runoff=25.44 cfs 1.896 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>1.69"
Flow Length=529' Tc=15.7 min CN=86 Runoff=9.08 cfs 0.595 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>1.77"
Flow Length=696' Tc=18.7 min CN=87 Runoff=3.16 cfs 0.226 af

Subcatchment 12S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>1.72"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=86.22 cfs 20.498 af

Subcatchment 14S: DA8-Onsite Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>1.32"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=53.77 cfs 8.822 af

Pond 1P: DA 1 Storage Peak Elev=898.81' Storage=37,429 cf Inflow=13.61 cfs 1.186 af
Outflow=0.71 cfs 0.342 af

Pond 2P: DA 2 Storage Peak Elev=897.55' Storage=14,028 cf Inflow=10.97 cfs 0.608 af
Primary=0.89 cfs 0.484 af Secondary=0.00 cfs 0.000 af Outflow=0.89 cfs 0.484 af

Pond 12P: DA 4 Storage Peak Elev=895.85' Storage=4,744 cf Inflow=5.44 cfs 0.768 af
Primary=1.83 cfs 0.751 af Secondary=0.00 cfs 0.000 af Outflow=1.83 cfs 0.751 af

Pond 13P: DA 7 Storage Peak Elev=881.11' Storage=273,890 cf Inflow=59.86 cfs 10.456 af
Primary=2.94 cfs 2.842 af Secondary=3.50 cfs 1.817 af Outflow=6.44 cfs 4.659 af

Pond 14P: DA 5 Storage Peak Elev=889.76' Storage=169,733 cf Inflow=20.07 cfs 1.497 af
Primary=1.41 cfs 0.991 af Secondary=0.00 cfs 0.000 af Outflow=1.41 cfs 0.991 af

Pond 17P: DA 6 Storage Peak Elev=888.02' Storage=106,446 cf Inflow=24.54 cfs 2.783 af
Primary=4.92 cfs 2.401 af Secondary=0.00 cfs 0.000 af Outflow=4.92 cfs 2.401 af

Pond 18P: DA 10 Storage Peak Elev=863.42' Storage=17,721 cf Inflow=9.08 cfs 0.595 af
Outflow=0.41 cfs 0.203 af

Pond 19P: DA 11 Storage Peak Elev=863.30' Storage=1,895 cf Inflow=3.16 cfs 0.226 af
Primary=1.76 cfs 0.225 af Secondary=0.00 cfs 0.000 af Outflow=1.76 cfs 0.225 af

Pond 20P: DA 3 Storage Peak Elev=891.25' Storage=441,668 cf Inflow=39.11 cfs 5.736 af
Primary=1.28 cfs 1.053 af Secondary=0.00 cfs 0.000 af Outflow=1.28 cfs 1.053 af

Link 2L: DA 8 >>> Discharge Inflow=131.27 cfs 36.583 af
Primary=131.27 cfs 36.583 af

Link 4L: Proposed Discharge Inflow=134.49 cfs 38.704 af
Primary=134.49 cfs 38.704 af

Link 15L: DA 9 >>> Discharge Inflow=27.07 cfs 2.121 af
Primary=27.07 cfs 2.121 af

Total Runoff Area = 379.969 ac Runoff Volume = 51.450 af Average Runoff Depth = 1.62"
95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac

Summary for Subcatchment 1S: DA 1

Runoff = 13.61 cfs @ 12.20 hrs, Volume= 1.186 af, Depth> 1.69"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 10.97 cfs @ 12.02 hrs, Volume= 0.608 af, Depth> 1.69"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 37.30 cfs @ 12.42 hrs, Volume= 4.644 af, Depth> 1.75"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 4.99 cfs @ 12.03 hrs, Volume= 0.283 af, Depth> 1.77"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 20.07 cfs @ 12.12 hrs, Volume= 1.497 af, Depth> 1.77"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 24.06 cfs @ 12.13 hrs, Volume= 1.793 af, Depth> 1.69"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 59.45 cfs @ 12.68 hrs, Volume= 9.403 af, Depth> 1.67"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 25.44 cfs @ 12.13 hrs, Volume= 1.896 af, Depth> 1.61"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.451	78	Row crops, straight row, Good, HSG B
	8.970	85	Row crops, straight row, Good, HSG C
	1.651	89	Row crops, straight row, Good, HSG D
	0.000	58	Meadow, non-grazed, HSG B
	0.025	71	Meadow, non-grazed, HSG C
	0.000	78	Meadow, non-grazed, HSG D
*	0.355	98	Prop Imp
	14.102	85	Weighted Average
	13.097		92.87% Pervious Area
	1.005		7.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 9.08 cfs @ 12.08 hrs, Volume= 0.595 af, Depth> 1.69"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
0.000	71	Meadow, non-grazed, HSG C
0.000	78	Meadow, non-grazed, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 3.16 cfs @ 12.11 hrs, Volume= 0.226 af, Depth> 1.77"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 86.22 cfs @ 13.25 hrs, Volume= 20.498 af, Depth> 1.72"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 14S: DA8-Onsite

Runoff = 53.77 cfs @ 12.71 hrs, Volume= 8.822 af, Depth> 1.32"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-Year Bulletin 70 Rainfall=3.04"

	Area (ac)	CN	Description
	14.070	89	Row crops, straight row, Good, HSG D
	26.220	85	Row crops, straight row, Good, HSG C
	5.300	78	Row crops, straight row, Good, HSG B
*	0.600	98	Proposed Impervious
	1.100	58	Meadow, non-grazed, HSG B
	9.880	71	Meadow, non-grazed, HSG C
	23.130	78	Meadow, non-grazed, HSG D
	80.300	81	Weighted Average
	79.700		99.25% Pervious Area
	0.600		0.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
28.6	1,200	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
63.9	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 13.61 cfs @ 12.20 hrs, Volume= 1.186 af
Outflow = 0.71 cfs @ 14.94 hrs, Volume= 0.342 af, Atten= 95%, Lag= 164.5 min
Primary = 0.71 cfs @ 14.94 hrs, Volume= 0.342 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.81' @ 14.94 hrs Surf.Area= 74,193 sf Storage= 37,429 cf

Plug-Flow detention time= 379.2 min calculated for 0.342 af (29% of inflow)
Center-of-Mass det. time= 249.6 min (1,085.8 - 836.2)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.71 cfs @ 14.94 hrs HW=898.81' TW=891.10' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.71 cfs @ 0.33 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 10.97 cfs @ 12.02 hrs, Volume= 0.608 af
Outflow = 0.89 cfs @ 12.73 hrs, Volume= 0.484 af, Atten= 92%, Lag= 42.4 min
Primary = 0.89 cfs @ 12.73 hrs, Volume= 0.484 af
Routed to Pond 12P : DA 4 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.55' @ 12.73 hrs Surf.Area= 33,582 sf Storage= 14,028 cf

Plug-Flow detention time= 243.2 min calculated for 0.484 af (80% of inflow)
Center-of-Mass det. time= 160.5 min (984.9 - 824.3)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=0.89 cfs @ 12.73 hrs HW=897.55' TW=895.81' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 0.89 cfs @ 2.94 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=897.00' TW=895.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 1.48" for 2-Year Bulletin 70 event
Inflow = 5.44 cfs @ 12.04 hrs, Volume= 0.768 af
Outflow = 1.83 cfs @ 12.31 hrs, Volume= 0.751 af, Atten= 66%, Lag= 16.6 min
Primary = 1.83 cfs @ 12.31 hrs, Volume= 0.751 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 895.85' @ 12.31 hrs Surf.Area= 10,246 sf Storage= 4,744 cf

Plug-Flow detention time= 41.6 min calculated for 0.750 af (98% of inflow)
Center-of-Mass det. time= 30.3 min (954.7 - 924.4)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.83 cfs @ 12.31 hrs HW=895.85' TW=890.54' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.83 cfs @ 3.48 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 1.10" for 2-Year Bulletin 70 event
Inflow = 59.86 cfs @ 12.68 hrs, Volume= 10.456 af
Outflow = 6.44 cfs @ 15.79 hrs, Volume= 4.659 af, Atten= 89%, Lag= 186.5 min
Primary = 2.94 cfs @ 15.79 hrs, Volume= 2.842 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 3.50 cfs @ 15.79 hrs, Volume= 1.817 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.11' @ 15.79 hrs Surf.Area= 321,111 sf Storage= 273,890 cf

Plug-Flow detention time= 333.0 min calculated for 4.659 af (45% of inflow)
Center-of-Mass det. time= 191.4 min (1,081.6 - 890.3)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.94 cfs @ 15.79 hrs HW=881.11' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.94 cfs @ 3.74 fps)

Secondary OutFlow Max=3.50 cfs @ 15.79 hrs HW=881.11' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 3.50 cfs @ 0.84 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 1.77" for 2-Year Bulletin 70 event
Inflow = 20.07 cfs @ 12.12 hrs, Volume= 1.497 af
Outflow = 1.41 cfs @ 13.54 hrs, Volume= 0.991 af, Atten= 93%, Lag= 85.1 min
Primary = 1.41 cfs @ 13.54 hrs, Volume= 0.991 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 889.76' @ 13.54 hrs Surf.Area= 79,690 sf Storage= 169,733 cf (38,279 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 202.9 min (1,030.6 - 827.8)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.41 cfs @ 13.54 hrs HW=889.76' TW=887.95' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.41 cfs @ 3.68 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 1.46" for 2-Year Bulletin 70 event
Inflow = 24.54 cfs @ 12.13 hrs, Volume= 2.783 af
Outflow = 4.92 cfs @ 12.74 hrs, Volume= 2.401 af, Atten= 80%, Lag= 36.7 min
Primary = 4.92 cfs @ 12.74 hrs, Volume= 2.401 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 888.02' @ 12.74 hrs Surf.Area= 37,008 sf Storage= 106,446 cf (38,933 cf above start)

Plug-Flow detention time= 508.4 min calculated for 0.851 af (31% of inflow)
Center-of-Mass det. time= 88.9 min (991.3 - 902.3)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.92 cfs @ 12.74 hrs HW=888.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 4.92 cfs @ 3.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 1.69" for 2-Year Bulletin 70 event
Inflow = 9.08 cfs @ 12.08 hrs, Volume= 0.595 af
Outflow = 0.41 cfs @ 14.16 hrs, Volume= 0.203 af, Atten= 95%, Lag= 124.7 min
Primary = 0.41 cfs @ 14.16 hrs, Volume= 0.203 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.42' @ 14.16 hrs Surf.Area= 54,352 sf Storage= 17,721 cf

Plug-Flow detention time= 345.4 min calculated for 0.203 af (34% of inflow)
Center-of-Mass det. time= 220.4 min (1,048.6 - 828.2)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.41 cfs @ 14.16 hrs HW=863.42' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.37 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 1.77" for 2-Year Bulletin 70 event
Inflow = 3.16 cfs @ 12.11 hrs, Volume= 0.226 af
Outflow = 1.76 cfs @ 12.27 hrs, Volume= 0.225 af, Atten= 44%, Lag= 9.7 min
Primary = 1.76 cfs @ 12.27 hrs, Volume= 0.225 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.30' @ 12.28 hrs Surf.Area= 3,490 sf Storage= 1,895 cf

Plug-Flow detention time= 15.2 min calculated for 0.225 af (99% of inflow)
Center-of-Mass det. time= 12.0 min (838.8 - 826.8)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.76 cfs @ 12.27 hrs HW=863.30' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.76 cfs @ 2.26 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=862.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 1.48" for 2-Year Bulletin 70 event
Inflow = 39.11 cfs @ 12.42 hrs, Volume= 5.736 af
Outflow = 1.28 cfs @ 24.00 hrs, Volume= 1.053 af, Atten= 97%, Lag= 694.7 min
Primary = 1.28 cfs @ 24.00 hrs, Volume= 1.053 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 891.25' @ 24.00 hrs Surf.Area= 268,996 sf Storage= 441,668 cf (203,998 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 251.6 min (1,126.8 - 875.2)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=1.28 cfs @ 24.00 hrs HW=891.25' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.28 cfs @ 2.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 1.20" for 2-Year Bulletin 70 event
Inflow = 131.27 cfs @ 13.00 hrs, Volume= 36.583 af
Primary = 131.27 cfs @ 13.00 hrs, Volume= 36.583 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 1.22" for 2-Year Bulletin 70 event
Inflow = 134.49 cfs @ 12.99 hrs, Volume= 38.704 af
Primary = 134.49 cfs @ 12.99 hrs, Volume= 38.704 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 1.63" for 2-Year Bulletin 70 event
Inflow = 27.07 cfs @ 12.13 hrs, Volume= 2.121 af
Primary = 27.07 cfs @ 12.13 hrs, Volume= 2.121 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=697' Tc=26.2 min CN=86 Runoff=23.75 cfs 2.082 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>2.97"
Flow Length=412' Tc=10.7 min CN=86 Runoff=18.90 cfs 1.066 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>3.04"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=64.42 cfs 8.048 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>3.06"
Flow Length=419' Tc=11.3 min CN=87 Runoff=8.48 cfs 0.491 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>3.06"
Tc=20.0 min CN=87 Runoff=34.38 cfs 2.592 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>2.96"
Tc=20.0 min CN=86 Runoff=41.86 cfs 3.146 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>2.93"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=104.36 cfs 16.518 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>2.87"
Flow Length=838' Tc=20.0 min CN=85 Runoff=44.98 cfs 3.370 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=529' Tc=15.7 min CN=86 Runoff=15.74 cfs 1.044 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>3.06"
Flow Length=696' Tc=18.7 min CN=87 Runoff=5.40 cfs 0.392 af

Subcatchment 12S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>2.99"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=149.67 cfs 35.585 af

Subcatchment 14S: DA8-Onsite Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>2.48"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=103.15 cfs 16.591 af

Pond 1P: DA 1 Storage Peak Elev=898.89' Storage=43,911 cf Inflow=23.75 cfs 2.082 af
Outflow=9.71 cfs 1.232 af

Pond 2P: DA 2 Storage Peak Elev=897.81' Storage=23,723 cf Inflow=18.90 cfs 1.066 af
Primary=1.71 cfs 0.843 af Secondary=1.40 cfs 0.064 af Outflow=3.11 cfs 0.907 af

Pond 12P: DA 4 Storage Peak Elev=896.34' Storage=11,331 cf Inflow=9.60 cfs 1.398 af
Primary=2.82 cfs 1.373 af Secondary=0.00 cfs 0.000 af Outflow=2.82 cfs 1.373 af

Pond 13P: DA 7 Storage Peak Elev=881.43' Storage=387,065 cf Inflow=105.51 cfs 18.309 af
Primary=3.24 cfs 3.180 af Secondary=26.72 cfs 8.957 af Outflow=29.96 cfs 12.136 af

Pond 14P: DA 5 Storage Peak Elev=890.08' Storage=197,532 cf Inflow=34.38 cfs 2.592 af
Primary=2.97 cfs 1.908 af Secondary=0.00 cfs 0.000 af Outflow=2.97 cfs 1.908 af

Pond 17P: DA 6 Storage Peak Elev=888.83' Storage=137,197 cf Inflow=43.22 cfs 5.053 af
Primary=9.13 cfs 4.559 af Secondary=0.00 cfs 0.000 af Outflow=9.13 cfs 4.559 af

Pond 18P: DA 10 Storage Peak Elev=863.51' Storage=22,709 cf Inflow=15.74 cfs 1.044 af
Outflow=4.53 cfs 0.648 af

Pond 19P: DA 11 Storage Peak Elev=863.75' Storage=4,005 cf Inflow=5.40 cfs 0.392 af
Primary=2.40 cfs 0.390 af Secondary=0.00 cfs 0.000 af Outflow=2.40 cfs 0.390 af

Pond 20P: DA 3 Storage Peak Elev=891.85' Storage=623,637 cf Inflow=75.61 cfs 10.653 af
Primary=2.02 cfs 1.792 af Secondary=0.00 cfs 0.000 af Outflow=2.02 cfs 1.792 af

Link 2L: DA 8 >>> Discharge Inflow=249.07 cfs 69.519 af
Primary=249.07 cfs 69.519 af

Link 4L: Proposed Discharge Inflow=255.03 cfs 73.279 af
Primary=255.03 cfs 73.279 af

Link 15L: DA 9 >>> Discharge Inflow=47.01 cfs 3.761 af
Primary=47.01 cfs 3.761 af

Total Runoff Area = 379.969 ac Runoff Volume = 90.924 af Average Runoff Depth = 2.87"
95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac

Summary for Subcatchment 1S: DA 1

Runoff = 23.75 cfs @ 12.20 hrs, Volume= 2.082 af, Depth> 2.96"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 18.90 cfs @ 12.02 hrs, Volume= 1.066 af, Depth> 2.97"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 64.42 cfs @ 12.42 hrs, Volume= 8.048 af, Depth> 3.04"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 8.48 cfs @ 12.03 hrs, Volume= 0.491 af, Depth> 3.06"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 34.38 cfs @ 12.12 hrs, Volume= 2.592 af, Depth> 3.06"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 41.86 cfs @ 12.12 hrs, Volume= 3.146 af, Depth> 2.96"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 104.36 cfs @ 12.68 hrs, Volume= 16.518 af, Depth> 2.93"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 44.98 cfs @ 12.12 hrs, Volume= 3.370 af, Depth> 2.87"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.451	78	Row crops, straight row, Good, HSG B
	8.970	85	Row crops, straight row, Good, HSG C
	1.651	89	Row crops, straight row, Good, HSG D
	0.000	58	Meadow, non-grazed, HSG B
	0.025	71	Meadow, non-grazed, HSG C
	0.000	78	Meadow, non-grazed, HSG D
*	0.355	98	Prop Imp
	14.102	85	Weighted Average
	13.097		92.87% Pervious Area
	1.005		7.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 15.74 cfs @ 12.07 hrs, Volume= 1.044 af, Depth> 2.96"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
0.000	71	Meadow, non-grazed, HSG C
0.000	78	Meadow, non-grazed, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 5.40 cfs @ 12.11 hrs, Volume= 0.392 af, Depth> 3.06"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 149.67 cfs @ 13.25 hrs, Volume= 35.585 af, Depth> 2.99"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 14S: DA8-Onsite

Runoff = 103.15 cfs @ 12.70 hrs, Volume= 16.591 af, Depth> 2.48"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-Year Bulletin 70 Rainfall=4.47"

	Area (ac)	CN	Description
	14.070	89	Row crops, straight row, Good, HSG D
	26.220	85	Row crops, straight row, Good, HSG C
	5.300	78	Row crops, straight row, Good, HSG B
*	0.600	98	Proposed Impervious
	1.100	58	Meadow, non-grazed, HSG B
	9.880	71	Meadow, non-grazed, HSG C
	23.130	78	Meadow, non-grazed, HSG D
	80.300	81	Weighted Average
	79.700		99.25% Pervious Area
	0.600		0.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
28.6	1,200	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
63.9	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 2.96" for 10-Year Bulletin 70 event
Inflow = 23.75 cfs @ 12.20 hrs, Volume= 2.082 af
Outflow = 9.71 cfs @ 12.53 hrs, Volume= 1.232 af, Atten= 59%, Lag= 19.7 min
Primary = 9.71 cfs @ 12.53 hrs, Volume= 1.232 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.89' @ 12.53 hrs Surf.Area= 79,992 sf Storage= 43,911 cf

Plug-Flow detention time= 198.7 min calculated for 1.232 af (59% of inflow)
Center-of-Mass det. time= 93.5 min (914.0 - 820.5)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.71 cfs @ 12.53 hrs HW=898.89' TW=891.03' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 9.71 cfs @ 0.79 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 2.97" for 10-Year Bulletin 70 event
Inflow = 18.90 cfs @ 12.02 hrs, Volume= 1.066 af
Outflow = 3.11 cfs @ 12.34 hrs, Volume= 0.907 af, Atten= 84%, Lag= 19.2 min
Primary = 1.71 cfs @ 12.34 hrs, Volume= 0.843 af
Routed to Pond 12P : DA 4 Storage
Secondary = 1.40 cfs @ 12.34 hrs, Volume= 0.064 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.81' @ 12.34 hrs Surf.Area= 41,166 sf Storage= 23,723 cf

Plug-Flow detention time= 211.0 min calculated for 0.907 af (85% of inflow)
Center-of-Mass det. time= 143.9 min (952.4 - 808.5)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=1.71 cfs @ 12.34 hrs HW=897.81' TW=896.26' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 1.71 cfs @ 3.43 fps)

Secondary OutFlow Max=1.40 cfs @ 12.34 hrs HW=897.81' TW=896.26' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.40 cfs @ 0.60 fps)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 2.69" for 10-Year Bulletin 70 event
Inflow = 9.60 cfs @ 12.04 hrs, Volume= 1.398 af
Outflow = 2.82 cfs @ 13.37 hrs, Volume= 1.373 af, Atten= 71%, Lag= 80.1 min
Primary = 2.82 cfs @ 13.37 hrs, Volume= 1.373 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 896.34' @ 12.82 hrs Surf.Area= 16,752 sf Storage= 11,331 cf

Plug-Flow detention time= 48.6 min calculated for 1.372 af (98% of inflow)
Center-of-Mass det. time= 39.2 min (940.0 - 900.9)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.82 cfs @ 13.37 hrs HW=896.28' TW=891.47' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.82 cfs @ 3.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 1.93" for 10-Year Bulletin 70 event
Inflow = 105.51 cfs @ 12.68 hrs, Volume= 18.309 af
Outflow = 29.96 cfs @ 13.75 hrs, Volume= 12.136 af, Atten= 72%, Lag= 64.6 min
Primary = 3.24 cfs @ 13.75 hrs, Volume= 3.180 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 26.72 cfs @ 13.75 hrs, Volume= 8.957 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.43' @ 13.75 hrs Surf.Area= 397,587 sf Storage= 387,065 cf

Plug-Flow detention time= 235.8 min calculated for 12.136 af (66% of inflow)
Center-of-Mass det. time= 122.4 min (996.3 - 873.9)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.24 cfs @ 13.75 hrs HW=881.43' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.24 cfs @ 4.13 fps)

Secondary OutFlow Max=26.72 cfs @ 13.75 hrs HW=881.43' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 26.72 cfs @ 1.69 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 3.06" for 10-Year Bulletin 70 event
Inflow = 34.38 cfs @ 12.12 hrs, Volume= 2.592 af
Outflow = 2.97 cfs @ 13.11 hrs, Volume= 1.908 af, Atten= 91%, Lag= 59.4 min
Primary = 2.97 cfs @ 13.11 hrs, Volume= 1.908 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 890.08' @ 13.11 hrs Surf.Area= 94,112 sf Storage= 197,532 cf (66,078 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 197.9 min (1,010.4 - 812.4)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.97 cfs @ 13.11 hrs HW=890.08' TW=888.78' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.97 cfs @ 4.37 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 2.65" for 10-Year Bulletin 70 event
Inflow = 43.22 cfs @ 12.13 hrs, Volume= 5.053 af
Outflow = 9.13 cfs @ 12.72 hrs, Volume= 4.559 af, Atten= 79%, Lag= 35.4 min
Primary = 9.13 cfs @ 12.72 hrs, Volume= 4.559 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 888.83' @ 12.72 hrs Surf.Area= 39,111 sf Storage= 137,197 cf (69,683 cf above start)

Plug-Flow detention time= 329.3 min calculated for 3.007 af (60% of inflow)
Center-of-Mass det. time= 84.1 min (973.3 - 889.2)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.13 cfs @ 12.72 hrs HW=888.83' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 9.13 cfs @ 5.17 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 2.96" for 10-Year Bulletin 70 event
Inflow = 15.74 cfs @ 12.07 hrs, Volume= 1.044 af
Outflow = 4.53 cfs @ 12.35 hrs, Volume= 0.648 af, Atten= 71%, Lag= 16.6 min
Primary = 4.53 cfs @ 12.35 hrs, Volume= 0.648 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.51' @ 12.35 hrs Surf.Area= 59,490 sf Storage= 22,709 cf

Plug-Flow detention time= 197.5 min calculated for 0.648 af (62% of inflow)
Center-of-Mass det. time= 93.4 min (905.7 - 812.4)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.53 cfs @ 12.35 hrs HW=863.51' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 4.53 cfs @ 0.82 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 3.06" for 10-Year Bulletin 70 event
Inflow = 5.40 cfs @ 12.11 hrs, Volume= 0.392 af
Outflow = 2.40 cfs @ 12.33 hrs, Volume= 0.390 af, Atten= 56%, Lag= 13.1 min
Primary = 2.40 cfs @ 12.33 hrs, Volume= 0.390 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.75' @ 12.33 hrs Surf.Area= 5,719 sf Storage= 4,005 cf

Plug-Flow detention time= 18.4 min calculated for 0.390 af (100% of inflow)
Center-of-Mass det. time= 15.7 min (827.1 - 811.4)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.40 cfs @ 12.33 hrs HW=863.75' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.40 cfs @ 3.05 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=862.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 2.75" for 10-Year Bulletin 70 event
Inflow = 75.61 cfs @ 12.44 hrs, Volume= 10.653 af
Outflow = 2.02 cfs @ 24.00 hrs, Volume= 1.792 af, Atten= 97%, Lag= 693.6 min
Primary = 2.02 cfs @ 24.00 hrs, Volume= 1.792 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 891.85' @ 24.00 hrs Surf.Area= 342,941 sf Storage= 623,637 cf (385,968 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 252.6 min (1,107.9 - 855.3)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.02 cfs @ 24.00 hrs HW=891.85' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.02 cfs @ 2.57 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 2.29" for 10-Year Bulletin 70 event
Inflow = 249.07 cfs @ 13.01 hrs, Volume= 69.519 af
Primary = 249.07 cfs @ 13.01 hrs, Volume= 69.519 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 2.31" for 10-Year Bulletin 70 event
Inflow = 255.03 cfs @ 13.00 hrs, Volume= 73.279 af
Primary = 255.03 cfs @ 13.00 hrs, Volume= 73.279 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 2.89" for 10-Year Bulletin 70 event
Inflow = 47.01 cfs @ 12.12 hrs, Volume= 3.761 af
Primary = 47.01 cfs @ 12.12 hrs, Volume= 3.761 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>3.92"
Flow Length=697' Tc=26.2 min CN=86 Runoff=31.25 cfs 2.761 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>3.94"
Flow Length=412' Tc=10.7 min CN=86 Runoff=24.74 cfs 1.414 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>4.01"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=84.41 cfs 10.618 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>4.04"
Flow Length=419' Tc=11.3 min CN=87 Runoff=11.03 cfs 0.647 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>4.03"
Tc=20.0 min CN=87 Runoff=44.94 cfs 3.419 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>3.93"
Tc=20.0 min CN=86 Runoff=55.03 cfs 4.172 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>3.89"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=137.80 cfs 21.917 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>3.82"
Flow Length=838' Tc=20.0 min CN=85 Runoff=59.51 cfs 4.495 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>3.93"
Flow Length=529' Tc=15.7 min CN=86 Runoff=20.66 cfs 1.385 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>4.03"
Flow Length=696' Tc=18.7 min CN=87 Runoff=7.04 cfs 0.517 af

Subcatchment 12S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>3.95"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=196.60 cfs 46.985 af

Subcatchment 14S: DA8-Onsite Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>3.39"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=140.99 cfs 22.652 af

Pond 1P: DA 1 Storage Peak Elev=898.96' Storage=49,133 cf Inflow=31.25 cfs 2.761 af
Outflow=20.10 cfs 1.908 af

Pond 2P: DA 2 Storage Peak Elev=897.92' Storage=28,310 cf Inflow=24.74 cfs 1.414 af
Primary=2.05 cfs 0.961 af Secondary=6.71 cfs 0.275 af Outflow=8.77 cfs 1.236 af

Pond 12P: DA 4 Storage Peak Elev=896.91' Storage=23,066 cf Inflow=15.31 cfs 1.883 af
Primary=3.32 cfs 1.854 af Secondary=0.00 cfs 0.000 af Outflow=3.32 cfs 1.854 af

Pond 13P: DA 7 Storage Peak Elev=881.62' Storage=468,012 cf Inflow=139.37 cfs 24.181 af
Primary=3.41 cfs 3.401 af Secondary=48.79 cfs 14.393 af Outflow=52.20 cfs 17.794 af

Pond 14P: DA 5 Storage Peak Elev=890.31' Storage=220,166 cf Inflow=44.94 cfs 3.419 af
Primary=3.88 cfs 2.603 af Secondary=0.00 cfs 0.000 af Outflow=3.88 cfs 2.603 af

Pond 17P: DA 6 Storage Peak Elev=889.36' Storage=161,733 cf Inflow=57.12 cfs 6.775 af
Primary=11.03 cfs 6.203 af Secondary=0.00 cfs 0.000 af Outflow=11.03 cfs 6.203 af

Pond 18P: DA 10 Storage Peak Elev=863.58' Storage=27,026 cf Inflow=20.66 cfs 1.385 af
Outflow=9.50 cfs 0.986 af

Pond 19P: DA 11 Storage Peak Elev=864.02' Storage=5,710 cf Inflow=7.04 cfs 0.517 af
Primary=2.75 cfs 0.513 af Secondary=0.20 cfs 0.002 af Outflow=2.94 cfs 0.515 af

Pond 20P: DA 3 Storage Peak Elev=892.23' Storage=765,397 cf Inflow=107.50 cfs 14.379 af
Primary=2.51 cfs 2.264 af Secondary=0.00 cfs 0.000 af Outflow=2.51 cfs 2.264 af

Link 2L: DA 8 >>> Discharge Inflow=349.82 cfs 94.619 af
Primary=349.82 cfs 94.619 af

Link 4L: Proposed Discharge Inflow=357.46 cfs 99.629 af
Primary=357.46 cfs 99.629 af

Link 15L: DA 9 >>> Discharge Inflow=61.86 cfs 5.010 af
Primary=61.86 cfs 5.010 af

Total Runoff Area = 379.969 ac Runoff Volume = 120.981 af Average Runoff Depth = 3.82"
95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac

Summary for Subcatchment 1S: DA 1

Runoff = 31.25 cfs @ 12.20 hrs, Volume= 2.761 af, Depth> 3.92"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 24.74 cfs @ 12.02 hrs, Volume= 1.414 af, Depth> 3.94"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 84.41 cfs @ 12.42 hrs, Volume= 10.618 af, Depth> 4.01"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 11.03 cfs @ 12.03 hrs, Volume= 0.647 af, Depth> 4.04"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 44.94 cfs @ 12.11 hrs, Volume= 3.419 af, Depth> 4.03"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 55.03 cfs @ 12.12 hrs, Volume= 4.172 af, Depth> 3.93"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 137.80 cfs @ 12.62 hrs, Volume= 21.917 af, Depth> 3.89"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 59.51 cfs @ 12.12 hrs, Volume= 4.495 af, Depth> 3.82"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.451	78	Row crops, straight row, Good, HSG B
	8.970	85	Row crops, straight row, Good, HSG C
	1.651	89	Row crops, straight row, Good, HSG D
	0.000	58	Meadow, non-grazed, HSG B
	0.025	71	Meadow, non-grazed, HSG C
	0.000	78	Meadow, non-grazed, HSG D
*	0.355	98	Prop Imp
	14.102	85	Weighted Average
	13.097		92.87% Pervious Area
	1.005		7.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 20.66 cfs @ 12.07 hrs, Volume= 1.385 af, Depth> 3.93"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
0.000	71	Meadow, non-grazed, HSG C
0.000	78	Meadow, non-grazed, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 7.04 cfs @ 12.11 hrs, Volume= 0.517 af, Depth> 4.03"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 196.60 cfs @ 13.25 hrs, Volume= 46.985 af, Depth> 3.95"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 14S: DA8-Onsite

Runoff = 140.99 cfs @ 12.70 hrs, Volume= 22.652 af, Depth> 3.39"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-Year Bulletin 70 Rainfall=5.51"

	Area (ac)	CN	Description
	14.070	89	Row crops, straight row, Good, HSG D
	26.220	85	Row crops, straight row, Good, HSG C
	5.300	78	Row crops, straight row, Good, HSG B
*	0.600	98	Proposed Impervious
	1.100	58	Meadow, non-grazed, HSG B
	9.880	71	Meadow, non-grazed, HSG C
	23.130	78	Meadow, non-grazed, HSG D
	80.300	81	Weighted Average
	79.700		99.25% Pervious Area
	0.600		0.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
28.6	1,200	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
63.9	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 3.92" for 25-Year Bulletin 70 event
Inflow = 31.25 cfs @ 12.20 hrs, Volume= 2.761 af
Outflow = 20.10 cfs @ 12.39 hrs, Volume= 1.908 af, Atten= 36%, Lag= 11.7 min
Primary = 20.10 cfs @ 12.39 hrs, Volume= 1.908 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.96' @ 12.39 hrs Surf.Area= 84,374 sf Storage= 49,133 cf

Plug-Flow detention time= 164.7 min calculated for 1.908 af (69% of inflow)
Center-of-Mass det. time= 69.7 min (882.4 - 812.7)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=20.10 cfs @ 12.39 hrs HW=898.96' TW=891.10' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 20.10 cfs @ 1.01 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 3.94" for 25-Year Bulletin 70 event
Inflow = 24.74 cfs @ 12.02 hrs, Volume= 1.414 af
Outflow = 8.77 cfs @ 12.18 hrs, Volume= 1.236 af, Atten= 65%, Lag= 9.9 min
Primary = 2.05 cfs @ 12.18 hrs, Volume= 0.961 af
Routed to Pond 12P : DA 4 Storage
Secondary = 6.71 cfs @ 12.18 hrs, Volume= 0.275 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.92' @ 12.18 hrs Surf.Area= 44,305 sf Storage= 28,310 cf

Plug-Flow detention time= 177.3 min calculated for 1.236 af (87% of inflow)
Center-of-Mass det. time= 117.6 min (918.2 - 800.5)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=2.05 cfs @ 12.18 hrs HW=897.92' TW=896.52' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.05 cfs @ 3.57 fps)

Secondary OutFlow Max=6.71 cfs @ 12.18 hrs HW=897.92' TW=896.52' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 6.71 cfs @ 1.01 fps)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 3.63" for 25-Year Bulletin 70 event
Inflow = 15.31 cfs @ 12.09 hrs, Volume= 1.883 af
Outflow = 3.32 cfs @ 12.91 hrs, Volume= 1.854 af, Atten= 78%, Lag= 48.8 min
Primary = 3.32 cfs @ 12.91 hrs, Volume= 1.854 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 896.91' @ 12.91 hrs Surf.Area= 24,745 sf Storage= 23,066 cf

Plug-Flow detention time= 71.6 min calculated for 1.854 af (98% of inflow)
Center-of-Mass det. time= 62.9 min (939.8 - 876.8)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.32 cfs @ 12.91 hrs HW=896.91' TW=891.63' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.32 cfs @ 4.23 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 2.54" for 25-Year Bulletin 70 event
Inflow = 139.37 cfs @ 12.63 hrs, Volume= 24.181 af
Outflow = 52.20 cfs @ 13.49 hrs, Volume= 17.794 af, Atten= 63%, Lag= 51.6 min
Primary = 3.41 cfs @ 13.49 hrs, Volume= 3.401 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 48.79 cfs @ 13.49 hrs, Volume= 14.393 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.62' @ 13.49 hrs Surf.Area= 444,282 sf Storage= 468,012 cf

Plug-Flow detention time= 203.0 min calculated for 17.794 af (74% of inflow)
Center-of-Mass det. time= 103.4 min (968.9 - 865.5)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.41 cfs @ 13.49 hrs HW=881.62' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.41 cfs @ 4.34 fps)

Secondary OutFlow Max=48.79 cfs @ 13.49 hrs HW=881.62' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 48.79 cfs @ 2.13 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 4.03" for 25-Year Bulletin 70 event
Inflow = 44.94 cfs @ 12.11 hrs, Volume= 3.419 af
Outflow = 3.88 cfs @ 14.40 hrs, Volume= 2.603 af, Atten= 91%, Lag= 136.9 min
Primary = 3.88 cfs @ 14.40 hrs, Volume= 2.603 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 890.31' @ 13.14 hrs Surf.Area= 104,394 sf Storage= 220,166 cf (88,712 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 204.5 min (1,009.2 - 804.7)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.88 cfs @ 14.40 hrs HW=890.26' TW=889.01' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.88 cfs @ 4.62 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 3.55" for 25-Year Bulletin 70 event
Inflow = 57.12 cfs @ 12.12 hrs, Volume= 6.775 af
Outflow = 11.03 cfs @ 12.74 hrs, Volume= 6.203 af, Atten= 81%, Lag= 37.4 min
Primary = 11.03 cfs @ 12.74 hrs, Volume= 6.203 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 889.36' @ 12.74 hrs Surf.Area= 59,679 sf Storage= 161,733 cf (94,220 cf above start)

Plug-Flow detention time= 285.2 min calculated for 4.651 af (69% of inflow)
Center-of-Mass det. time= 89.4 min (974.6 - 885.2)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=11.03 cfs @ 12.74 hrs HW=889.36' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 11.03 cfs @ 6.24 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 3.93" for 25-Year Bulletin 70 event
Inflow = 20.66 cfs @ 12.07 hrs, Volume= 1.385 af
Outflow = 9.50 cfs @ 12.25 hrs, Volume= 0.986 af, Atten= 54%, Lag= 10.9 min
Primary = 9.50 cfs @ 12.25 hrs, Volume= 0.986 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.58' @ 12.25 hrs Surf.Area= 63,601 sf Storage= 27,026 cf

Plug-Flow detention time= 166.0 min calculated for 0.985 af (71% of inflow)
Center-of-Mass det. time= 72.5 min (876.9 - 804.4)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=9.50 cfs @ 12.25 hrs HW=863.58' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 9.50 cfs @ 1.06 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 4.03" for 25-Year Bulletin 70 event
Inflow = 7.04 cfs @ 12.11 hrs, Volume= 0.517 af
Outflow = 2.94 cfs @ 12.34 hrs, Volume= 0.515 af, Atten= 58%, Lag= 13.8 min
Primary = 2.75 cfs @ 12.34 hrs, Volume= 0.513 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 0.20 cfs @ 12.34 hrs, Volume= 0.002 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.02' @ 12.34 hrs Surf.Area= 7,145 sf Storage= 5,710 cf

Plug-Flow detention time= 20.7 min calculated for 0.515 af (100% of inflow)
Center-of-Mass det. time= 18.2 min (821.9 - 803.7)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.75 cfs @ 12.34 hrs HW=864.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.75 cfs @ 3.50 fps)

Secondary OutFlow Max=0.20 cfs @ 12.34 hrs HW=864.02' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.20 cfs @ 0.37 fps)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 3.71" for 25-Year Bulletin 70 event
Inflow = 107.50 cfs @ 12.42 hrs, Volume= 14.379 af
Outflow = 2.51 cfs @ 24.00 hrs, Volume= 2.264 af, Atten= 98%, Lag= 695.0 min
Primary = 2.51 cfs @ 24.00 hrs, Volume= 2.264 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.23' @ 24.00 hrs Surf.Area= 390,972 sf Storage= 765,397 cf (527,728 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 256.9 min (1,103.7 - 846.8)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.51 cfs @ 24.00 hrs HW=892.23' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.51 cfs @ 3.19 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 3.12" for 25-Year Bulletin 70 event
Inflow = 349.82 cfs @ 13.00 hrs, Volume= 94.619 af
Primary = 349.82 cfs @ 13.00 hrs, Volume= 94.619 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 3.15" for 25-Year Bulletin 70 event
Inflow = 357.46 cfs @ 13.00 hrs, Volume= 99.629 af
Primary = 357.46 cfs @ 13.00 hrs, Volume= 99.629 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 3.84" for 25-Year Bulletin 70 event
Inflow = 61.86 cfs @ 12.12 hrs, Volume= 5.010 af
Primary = 61.86 cfs @ 12.12 hrs, Volume= 5.010 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>4.82"
Flow Length=697' Tc=26.2 min CN=86 Runoff=38.09 cfs 3.393 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>4.84"
Flow Length=412' Tc=10.7 min CN=86 Runoff=30.07 cfs 1.737 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>4.91"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=102.67 cfs 13.004 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>4.95"
Flow Length=419' Tc=11.3 min CN=87 Runoff=13.36 cfs 0.793 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>4.94"
Tc=20.0 min CN=87 Runoff=54.55 cfs 4.186 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>4.83"
Tc=20.0 min CN=86 Runoff=67.13 cfs 5.127 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>4.78"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=168.55 cfs 26.943 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>4.72"
Flow Length=838' Tc=20.0 min CN=85 Runoff=72.90 cfs 5.544 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>4.83"
Flow Length=529' Tc=15.7 min CN=86 Runoff=25.14 cfs 1.702 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>4.94"
Flow Length=696' Tc=18.7 min CN=87 Runoff=8.54 cfs 0.633 af

Subcatchment 12S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>4.84"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=239.57 cfs 57.572 af

Subcatchment 14S: DA8-Onsite Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>4.24"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=176.17 cfs 28.367 af

Pond 1P: DA 1 Storage Peak Elev=899.00' Storage=53,153 cf Inflow=38.09 cfs 3.393 af
Outflow=29.25 cfs 2.537 af

Pond 2P: DA 2 Storage Peak Elev=898.00' Storage=32,031 cf Inflow=30.07 cfs 1.737 af
Primary=2.30 cfs 1.023 af Secondary=12.34 cfs 0.518 af Outflow=14.64 cfs 1.541 af

Pond 12P: DA 4 Storage Peak Elev=897.30' Storage=34,168 cf Inflow=24.00 cfs 2.334 af
Primary=3.68 cfs 2.300 af Secondary=0.00 cfs 0.000 af Outflow=3.68 cfs 2.300 af

Pond 13P: DA 7 Storage Peak Elev=881.78' Storage=543,354 cf Inflow=170.27 cfs 29.559 af
Primary=3.55 cfs 3.587 af Secondary=68.94 cfs 19.418 af Outflow=72.49 cfs 23.005 af

Pond 14P: DA 5 Storage Peak Elev=890.51' Storage=241,872 cf Inflow=54.55 cfs 4.186 af
Primary=4.38 cfs 3.234 af Secondary=0.00 cfs 0.000 af Outflow=4.38 cfs 3.234 af

Pond 17P: DA 6 Storage Peak Elev=889.70' Storage=185,322 cf Inflow=69.86 cfs 8.361 af
Primary=12.10 cfs 7.711 af Secondary=0.00 cfs 0.000 af Outflow=12.10 cfs 7.711 af

Pond 18P: DA 10 Storage Peak Elev=863.63' Storage=30,610 cf Inflow=25.14 cfs 1.702 af
Outflow=14.24 cfs 1.300 af

Pond 19P: DA 11 Storage Peak Elev=864.12' Storage=6,451 cf Inflow=8.54 cfs 0.633 af
Primary=2.86 cfs 0.591 af Secondary=2.45 cfs 0.039 af Outflow=5.31 cfs 0.631 af

Pond 20P: DA 3 Storage Peak Elev=892.56' Storage=900,834 cf Inflow=133.86 cfs 17.841 af
Primary=2.86 cfs 2.616 af Secondary=0.00 cfs 0.000 af Outflow=2.86 cfs 2.616 af

Link 2L: DA 8 >>> Discharge Inflow=442.57 cfs 117.955 af
Primary=442.57 cfs 117.955 af

Link 4L: Proposed Discharge Inflow=451.56 cfs 124.130 af
Primary=451.56 cfs 124.130 af

Link 15L: DA 9 >>> Discharge Inflow=75.41 cfs 6.174 af
Primary=75.41 cfs 6.174 af

Total Runoff Area = 379.969 ac Runoff Volume = 149.000 af Average Runoff Depth = 4.71"
95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac

Summary for Subcatchment 1S: DA 1

Runoff = 38.09 cfs @ 12.19 hrs, Volume= 3.393 af, Depth> 4.82"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 30.07 cfs @ 12.02 hrs, Volume= 1.737 af, Depth> 4.84"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 102.67 cfs @ 12.42 hrs, Volume= 13.004 af, Depth> 4.91"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 13.36 cfs @ 12.02 hrs, Volume= 0.793 af, Depth> 4.95"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 54.55 cfs @ 12.11 hrs, Volume= 4.186 af, Depth> 4.94"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 67.13 cfs @ 12.11 hrs, Volume= 5.127 af, Depth> 4.83"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 168.55 cfs @ 12.62 hrs, Volume= 26.943 af, Depth> 4.78"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 72.90 cfs @ 12.11 hrs, Volume= 5.544 af, Depth> 4.72"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.451	78	Row crops, straight row, Good, HSG B
	8.970	85	Row crops, straight row, Good, HSG C
	1.651	89	Row crops, straight row, Good, HSG D
	0.000	58	Meadow, non-grazed, HSG B
	0.025	71	Meadow, non-grazed, HSG C
	0.000	78	Meadow, non-grazed, HSG D
*	0.355	98	Prop Imp
	14.102	85	Weighted Average
	13.097		92.87% Pervious Area
	1.005		7.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 25.14 cfs @ 12.07 hrs, Volume= 1.702 af, Depth> 4.83"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
0.000	71	Meadow, non-grazed, HSG C
0.000	78	Meadow, non-grazed, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 8.54 cfs @ 12.11 hrs, Volume= 0.633 af, Depth> 4.94"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 239.57 cfs @ 13.25 hrs, Volume= 57.572 af, Depth> 4.84"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 14S: DA8-Onsite

Runoff = 176.17 cfs @ 12.70 hrs, Volume= 28.367 af, Depth> 4.24"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-Year Bulletin 70 Rainfall=6.46"

	Area (ac)	CN	Description
	14.070	89	Row crops, straight row, Good, HSG D
	26.220	85	Row crops, straight row, Good, HSG C
	5.300	78	Row crops, straight row, Good, HSG B
*	0.600	98	Proposed Impervious
	1.100	58	Meadow, non-grazed, HSG B
	9.880	71	Meadow, non-grazed, HSG C
	23.130	78	Meadow, non-grazed, HSG D
	80.300	81	Weighted Average
	79.700		99.25% Pervious Area
	0.600		0.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
28.6	1,200	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
63.9	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 4.82" for 50-Year Bulletin 70 event
Inflow = 38.09 cfs @ 12.19 hrs, Volume= 3.393 af
Outflow = 29.25 cfs @ 12.34 hrs, Volume= 2.537 af, Atten= 23%, Lag= 8.5 min
Primary = 29.25 cfs @ 12.34 hrs, Volume= 2.537 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 899.00' @ 12.34 hrs Surf.Area= 87,640 sf Storage= 53,153 cf

Plug-Flow detention time= 146.8 min calculated for 2.537 af (75% of inflow)
Center-of-Mass det. time= 59.8 min (866.8 - 807.0)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=29.24 cfs @ 12.34 hrs HW=899.00' TW=891.21' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 29.24 cfs @ 1.15 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 4.84" for 50-Year Bulletin 70 event
Inflow = 30.07 cfs @ 12.02 hrs, Volume= 1.737 af
Outflow = 14.64 cfs @ 12.15 hrs, Volume= 1.541 af, Atten= 51%, Lag= 7.6 min
Primary = 2.30 cfs @ 12.15 hrs, Volume= 1.023 af
Routed to Pond 12P : DA 4 Storage
Secondary = 12.34 cfs @ 12.15 hrs, Volume= 0.518 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.00' @ 12.15 hrs Surf.Area= 46,697 sf Storage= 32,031 cf

Plug-Flow detention time= 160.9 min calculated for 1.540 af (89% of inflow)
Center-of-Mass det. time= 105.8 min (900.5 - 794.8)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=2.30 cfs @ 12.15 hrs HW=898.00' TW=896.74' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.30 cfs @ 3.64 fps)

Secondary OutFlow Max=12.33 cfs @ 12.15 hrs HW=898.00' TW=896.74' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 12.33 cfs @ 1.25 fps)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 4.49" for 50-Year Bulletin 70 event
Inflow = 24.00 cfs @ 12.09 hrs, Volume= 2.334 af
Outflow = 3.68 cfs @ 12.95 hrs, Volume= 2.300 af, Atten= 85%, Lag= 51.7 min
Primary = 3.68 cfs @ 12.95 hrs, Volume= 2.300 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.30' @ 12.95 hrs Surf.Area= 33,056 sf Storage= 34,168 cf

Plug-Flow detention time= 92.8 min calculated for 2.299 af (98% of inflow)
Center-of-Mass det. time= 84.6 min (948.3 - 863.8)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.68 cfs @ 12.95 hrs HW=897.30' TW=891.91' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.68 cfs @ 4.69 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 3.11" for 50-Year Bulletin 70 event
Inflow = 170.27 cfs @ 12.62 hrs, Volume= 29.559 af
Outflow = 72.49 cfs @ 13.38 hrs, Volume= 23.005 af, Atten= 57%, Lag= 45.4 min
Primary = 3.55 cfs @ 13.38 hrs, Volume= 3.587 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 68.94 cfs @ 13.38 hrs, Volume= 19.418 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.78' @ 13.38 hrs Surf.Area= 483,711 sf Storage= 543,354 cf

Plug-Flow detention time= 183.6 min calculated for 22.995 af (78% of inflow)
Center-of-Mass det. time= 94.4 min (953.0 - 858.7)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.55 cfs @ 13.38 hrs HW=881.78' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.55 cfs @ 4.52 fps)

Secondary OutFlow Max=68.94 cfs @ 13.38 hrs HW=881.78' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 68.94 cfs @ 2.38 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 4.94" for 50-Year Bulletin 70 event
Inflow = 54.55 cfs @ 12.11 hrs, Volume= 4.186 af
Outflow = 4.38 cfs @ 15.30 hrs, Volume= 3.234 af, Atten= 92%, Lag= 191.4 min
Primary = 4.38 cfs @ 15.30 hrs, Volume= 3.234 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 890.51' @ 13.24 hrs Surf.Area= 113,381 sf Storage= 241,872 cf (110,418 cf above start)

Plug-Flow detention time= 903.2 min calculated for 0.216 af (5% of inflow)
Center-of-Mass det. time= 216.6 min (1,015.7 - 799.1)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.38 cfs @ 15.30 hrs HW=890.40' TW=889.22' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 4.38 cfs @ 4.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 4.38" for 50-Year Bulletin 70 event
Inflow = 69.86 cfs @ 12.12 hrs, Volume= 8.361 af
Outflow = 12.10 cfs @ 12.79 hrs, Volume= 7.711 af, Atten= 83%, Lag= 40.5 min
Primary = 12.10 cfs @ 12.79 hrs, Volume= 7.711 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 889.70' @ 12.79 hrs Surf.Area= 78,673 sf Storage= 185,322 cf (117,808 cf above start)

Plug-Flow detention time= 268.2 min calculated for 6.159 af (74% of inflow)
Center-of-Mass det. time= 97.4 min (982.2 - 884.7)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=12.10 cfs @ 12.79 hrs HW=889.70' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 12.10 cfs @ 6.85 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=886.93' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 4.83" for 50-Year Bulletin 70 event
Inflow = 25.14 cfs @ 12.07 hrs, Volume= 1.702 af
Outflow = 14.24 cfs @ 12.22 hrs, Volume= 1.300 af, Atten= 43%, Lag= 8.8 min
Primary = 14.24 cfs @ 12.22 hrs, Volume= 1.300 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.63' @ 12.22 hrs Surf.Area= 66,823 sf Storage= 30,610 cf

Plug-Flow detention time= 149.1 min calculated for 1.300 af (76% of inflow)
Center-of-Mass det. time= 63.5 min (862.3 - 798.7)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=14.24 cfs @ 12.22 hrs HW=863.63' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 14.24 cfs @ 1.21 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 4.94" for 50-Year Bulletin 70 event
Inflow = 8.54 cfs @ 12.11 hrs, Volume= 0.633 af
Outflow = 5.31 cfs @ 12.26 hrs, Volume= 0.631 af, Atten= 38%, Lag= 9.0 min
Primary = 2.86 cfs @ 12.26 hrs, Volume= 0.591 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 2.45 cfs @ 12.26 hrs, Volume= 0.039 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.12' @ 12.26 hrs Surf.Area= 8,161 sf Storage= 6,451 cf

Plug-Flow detention time= 19.9 min calculated for 0.630 af (100% of inflow)
Center-of-Mass det. time= 17.5 min (815.6 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.86 cfs @ 12.26 hrs HW=864.12' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.86 cfs @ 3.64 fps)

Secondary OutFlow Max=2.45 cfs @ 12.26 hrs HW=864.12' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.45 cfs @ 0.86 fps)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 4.61" for 50-Year Bulletin 70 event
Inflow = 133.86 cfs @ 12.38 hrs, Volume= 17.841 af
Outflow = 2.86 cfs @ 24.00 hrs, Volume= 2.616 af, Atten= 98%, Lag= 697.1 min
Primary = 2.86 cfs @ 24.00 hrs, Volume= 2.616 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.56' @ 24.00 hrs Surf.Area= 431,900 sf Storage= 900,834 cf (663,164 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 256.8 min (1,099.0 - 842.2)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.86 cfs @ 24.00 hrs HW=892.56' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.86 cfs @ 3.64 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 3.89" for 50-Year Bulletin 70 event
Inflow = 442.57 cfs @ 13.00 hrs, Volume= 117.955 af
Primary = 442.57 cfs @ 13.00 hrs, Volume= 117.955 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 3.92" for 50-Year Bulletin 70 event
Inflow = 451.56 cfs @ 13.00 hrs, Volume= 124.130 af
Primary = 451.56 cfs @ 13.00 hrs, Volume= 124.130 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 4.74" for 50-Year Bulletin 70 event
Inflow = 75.41 cfs @ 12.12 hrs, Volume= 6.174 af
Primary = 75.41 cfs @ 12.12 hrs, Volume= 6.174 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=8.447 ac 0.00% Impervious Runoff Depth>5.89"
Flow Length=697' Tc=26.2 min CN=86 Runoff=46.16 cfs 4.148 af

Subcatchment 2S: DA 2 Runoff Area=4.310 ac 1.86% Impervious Runoff Depth>5.91"
Flow Length=412' Tc=10.7 min CN=86 Runoff=36.33 cfs 2.123 af

Subcatchment 3S: DA 3 Runoff Area=31.778 ac 1.70% Impervious Runoff Depth>5.98"
Flow Length=1,903' Tc=44.9 min CN=87 Runoff=124.15 cfs 15.848 af

Subcatchment 4S: DA 4 Runoff Area=1.923 ac 5.72% Impervious Runoff Depth>6.03"
Flow Length=419' Tc=11.3 min CN=87 Runoff=16.10 cfs 0.966 af

Subcatchment 5S: DA 5 Runoff Area=10.174 ac 32.22% Impervious Runoff Depth>6.02"
Tc=20.0 min CN=87 Runoff=65.84 cfs 5.101 af

Subcatchment 6S: DA 6 Runoff Area=12.745 ac 21.73% Impervious Runoff Depth>5.90"
Tc=20.0 min CN=86 Runoff=81.30 cfs 6.266 af

Subcatchment 7S: DA 7 Runoff Area=67.624 ac 4.47% Impervious Runoff Depth>5.85"
Flow Length=3,134' Tc=62.4 min CN=86 Runoff=204.74 cfs 32.941 af

Subcatchment 9S: DA 9 Runoff Area=14.102 ac 7.13% Impervious Runoff Depth>5.78"
Flow Length=838' Tc=20.0 min CN=85 Runoff=88.60 cfs 6.797 af

Subcatchment 10S: DA 10 Runoff Area=4.227 ac 0.00% Impervious Runoff Depth>5.91"
Flow Length=529' Tc=15.7 min CN=86 Runoff=30.42 cfs 2.080 af

Subcatchment 11S: DA 11 Runoff Area=1.538 ac 18.86% Impervious Runoff Depth>6.02"
Flow Length=696' Tc=18.7 min CN=87 Runoff=10.31 cfs 0.771 af

Subcatchment 12S: DA 8 - Offsite Runoff Area=142.801 ac 3.71% Impervious Runoff Depth>5.90"
Flow Length=5,489' Tc=109.4 min CN=87 Runoff=290.16 cfs 70.192 af

Subcatchment 14S: DA8-Onsite Runoff Area=80.300 ac 0.75% Impervious Runoff Depth>5.27"
Flow Length=1,500' Slope=0.0100 '/' Tc=63.9 min CN=81 Runoff=218.24 cfs 35.252 af

Pond 1P: DA 1 Storage Peak Elev=899.05' Storage=57,060 cf Inflow=46.16 cfs 4.148 af
Outflow=38.95 cfs 3.288 af

Pond 2P: DA 2 Storage Peak Elev=898.08' Storage=35,839 cf Inflow=36.33 cfs 2.123 af
Primary=2.51 cfs 1.032 af Secondary=18.97 cfs 0.871 af Outflow=21.48 cfs 1.904 af

Pond 12P: DA 4 Storage Peak Elev=897.66' Storage=47,765 cf Inflow=34.01 cfs 2.870 af
Primary=3.99 cfs 2.829 af Secondary=0.00 cfs 0.000 af Outflow=3.99 cfs 2.829 af

Pond 13P: DA 7 Storage Peak Elev=881.96' Storage=632,165 cf Inflow=206.85 cfs 35.908 af
Primary=3.69 cfs 3.789 af Secondary=93.12 cfs 25.390 af Outflow=96.82 cfs 29.179 af

Pond 14P: DA 5 Storage Peak Elev=890.74' Storage=268,693 cf Inflow=65.84 cfs 5.101 af
Primary=4.88 cfs 3.946 af Secondary=0.00 cfs 0.000 af Outflow=4.88 cfs 3.946 af

Pond 17P: DA 6 Storage Peak Elev=890.02' Storage=213,504 cf Inflow=84.61 cfs 10.213 af
Primary=13.03 cfs 9.440 af Secondary=0.37 cfs 0.011 af Outflow=13.40 cfs 9.451 af

Pond 18P: DA 10 Storage Peak Elev=863.69' Storage=34,315 cf Inflow=30.42 cfs 2.080 af
Outflow=19.59 cfs 1.676 af

Pond 19P: DA 11 Storage Peak Elev=864.19' Storage=7,032 cf Inflow=10.31 cfs 0.771 af
Primary=2.94 cfs 0.676 af Secondary=4.84 cfs 0.093 af Outflow=7.78 cfs 0.769 af

Pond 20P: DA 3 Storage Peak Elev=892.92' Storage=1,065,249 cf Inflow=163.66 cfs 21.965 af
Primary=3.20 cfs 2.966 af Secondary=0.00 cfs 0.000 af Outflow=3.20 cfs 2.966 af

Link 2L: DA 8 >>> Discharge Inflow=550.71 cfs 145.750 af
Primary=550.71 cfs 145.750 af

Link 4L: Proposed Discharge Inflow=561.22 cfs 153.316 af
Primary=561.22 cfs 153.316 af

Link 15L: DA 9 >>> Discharge Inflow=93.14 cfs 7.566 af
Primary=93.14 cfs 7.566 af

Total Runoff Area = 379.969 ac Runoff Volume = 182.487 af Average Runoff Depth = 5.76"
95.53% Pervious = 362.979 ac 4.47% Impervious = 16.989 ac

Summary for Subcatchment 1S: DA 1

Runoff = 46.16 cfs @ 12.19 hrs, Volume= 4.148 af, Depth> 5.89"
Routed to Pond 1P : DA 1 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

Area (ac)	CN	Description
5.805	85	Row crops, straight row, Good, HSG C
2.642	89	Row crops, straight row, Good, HSG D
8.447	86	Weighted Average
8.447		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.3	100	0.0102	0.26		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
19.9	597	0.0031	0.50		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
26.2	697	Total			

Summary for Subcatchment 2S: DA 2

Runoff = 36.33 cfs @ 12.02 hrs, Volume= 2.123 af, Depth> 5.91"
Routed to Pond 2P : DA 2 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.080	98	EX Imp
	3.280	85	Row crops, straight row, Good, HSG C
	0.950	89	Row crops, straight row, Good, HSG D
	4.310	86	Weighted Average
	4.230		98.14% Pervious Area
	0.080		1.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	100	0.0090	0.25		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
4.1	312	0.0196	1.26		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.7	412	Total			

Summary for Subcatchment 3S: DA 3

Runoff = 124.15 cfs @ 12.42 hrs, Volume= 15.848 af, Depth> 5.98"
Routed to Pond 20P : DA 3 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.540	98	EX Imp
	18.238	85	Row crops, straight row, Good, HSG C
	13.000	89	Row crops, straight row, Good, HSG D
	31.778	87	Weighted Average
	31.238		98.30% Pervious Area
	0.540		1.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	100	0.0160	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
39.6	1,803	0.0071	0.76		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
44.9	1,903	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 16.10 cfs @ 12.02 hrs, Volume= 0.966 af, Depth> 6.03"
Routed to Pond 12P : DA 4 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.110	98	EX Imp
	1.206	85	Row crops, straight row, Good, HSG C
	0.607	89	Row crops, straight row, Good, HSG D
	1.923	87	Weighted Average
	1.813		94.28% Pervious Area
	0.110		5.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	100	0.0188	0.34		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
6.3	319	0.0089	0.85		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
11.3	419	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 65.84 cfs @ 12.11 hrs, Volume= 5.101 af, Depth> 6.02"
Routed to Pond 14P : DA 5 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
	3.625	85	Row crops, straight row, Good, HSG C
	0.487	89	Row crops, straight row, Good, HSG D
*	2.350	98	EX Imp
	2.941	80	1/2 acre lots, 25% imp, HSG C
	0.771	85	1/2 acre lots, 25% imp, HSG D
	10.174	87	Weighted Average
	6.896		67.78% Pervious Area
	3.278		32.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 6S: DA 6

Runoff = 81.30 cfs @ 12.11 hrs, Volume= 6.266 af, Depth> 5.90"
Routed to Pond 17P : DA 6 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	1.860	98	EX Imp
	6.291	85	Row crops, straight row, Good, HSG C
	0.955	89	Row crops, straight row, Good, HSG D
	3.140	80	1/2 acre lots, 25% imp, HSG C
	0.499	85	1/2 acre lots, 25% imp, HSG D
	12.745	86	Weighted Average
	9.975		78.27% Pervious Area
	2.770		21.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					**Direct Entry,**

Summary for Subcatchment 7S: DA 7

Runoff = 204.74 cfs @ 12.62 hrs, Volume= 32.941 af, Depth> 5.85"
Routed to Pond 13P : DA 7 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
	39.504	85	Row crops, straight row, Good, HSG C
	18.825	89	Row crops, straight row, Good, HSG D
*	1.820	98	EX Imp
	3.089	80	1/2 acre lots, 25% imp, HSG C
	1.709	85	1/2 acre lots, 25% imp, HSG D
	1.150	79	Pasture/grassland/range, Fair, HSG C
	1.527	84	Pasture/grassland/range, Fair, HSG D
	67.624	86	Weighted Average
	64.604		95.53% Pervious Area
	3.020		4.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0360	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
58.6	3,034	0.0092	0.86		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
62.4	3,134	Total			

Summary for Subcatchment 9S: DA 9

Runoff = 88.60 cfs @ 12.11 hrs, Volume= 6.797 af, Depth> 5.78"
Routed to Link 15L : DA 9 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.650	98	EX Imp
	2.451	78	Row crops, straight row, Good, HSG B
	8.970	85	Row crops, straight row, Good, HSG C
	1.651	89	Row crops, straight row, Good, HSG D
	0.000	58	Meadow, non-grazed, HSG B
	0.025	71	Meadow, non-grazed, HSG C
	0.000	78	Meadow, non-grazed, HSG D
*	0.355	98	Prop Imp
	14.102	85	Weighted Average
	13.097		92.87% Pervious Area
	1.005		7.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	100	0.0081	0.24		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
13.1	738	0.0109	0.94		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
20.0	838	Total			

Summary for Subcatchment 10S: DA 10

Runoff = 30.42 cfs @ 12.07 hrs, Volume= 2.080 af, Depth> 5.91"
Routed to Pond 18P : DA 10 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

Area (ac)	CN	Description
2.804	85	Row crops, straight row, Good, HSG C
1.423	89	Row crops, straight row, Good, HSG D
0.000	71	Meadow, non-grazed, HSG C
0.000	78	Meadow, non-grazed, HSG D
4.227	86	Weighted Average
4.227		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	100	0.0067	0.22		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
8.2	429	0.0095	0.88		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
15.7	529	Total			

Summary for Subcatchment 11S: DA 11

Runoff = 10.31 cfs @ 12.11 hrs, Volume= 0.771 af, Depth> 6.02"
Routed to Pond 19P : DA 11 Storage

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	0.290	98	EX Imp
	1.233	85	Row crops, straight row, Good, HSG C
	0.015	89	Row crops, straight row, Good, HSG D
	1.538	87	Weighted Average
	1.248		81.14% Pervious Area
	0.290		18.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	100	0.0361	0.44		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
14.9	596	0.0055	0.67		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
18.7	696	Total			

Summary for Subcatchment 12S: DA 8 - Offsite

Runoff = 290.16 cfs @ 13.25 hrs, Volume= 70.192 af, Depth> 5.90"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
*	3.970	98	Ex Imp
	3.969	80	1/2 acre lots, 25% imp, HSG C
	1.340	85	1/2 acre lots, 25% imp, HSG D
	2.443	79	Pasture/grassland/range, Fair, HSG C
	1.552	84	Pasture/grassland/range, Fair, HSG D
	0.000	78	Row crops, straight row, Good, HSG B
	71.424	85	Row crops, straight row, Good, HSG C
	58.103	89	Row crops, straight row, Good, HSG D
	142.801	87	Weighted Average
	137.504		96.29% Pervious Area
	5.297		3.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.7	100	0.0217	0.36		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.04"
103.4	3,704	0.0044	0.60		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.3	1,685	0.0055	22.10	72,207.12	**Channel Flow,** Area= 3,267.0 sf Perim= 291.0' r= 11.23' n= 0.025 Earth, clean & winding
109.4	5,489	Total			

Summary for Subcatchment 14S: DA8-Onsite

Runoff = 218.24 cfs @ 12.64 hrs, Volume= 35.252 af, Depth> 5.27"
Routed to Link 2L : DA 8 >>> Discharge

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-Year Bulletin 70 Rainfall=7.58"

	Area (ac)	CN	Description
	14.070	89	Row crops, straight row, Good, HSG D
	26.220	85	Row crops, straight row, Good, HSG C
	5.300	78	Row crops, straight row, Good, HSG B
*	0.600	98	Proposed Impervious
	1.100	58	Meadow, non-grazed, HSG B
	9.880	71	Meadow, non-grazed, HSG C
	23.130	78	Meadow, non-grazed, HSG D
	80.300	81	Weighted Average
	79.700		99.25% Pervious Area
	0.600		0.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	300	0.0100	0.14		**Sheet Flow,** Cultivated: Residue>20% n= 0.170 P2= 3.04"
28.6	1,200	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
63.9	1,500	Total			

Summary for Pond 1P: DA 1 Storage

Inflow Area = 8.447 ac, 0.00% Impervious, Inflow Depth > 5.89" for 100-Year Bulletin 70 event
Inflow = 46.16 cfs @ 12.19 hrs, Volume= 4.148 af
Outflow = 38.95 cfs @ 12.30 hrs, Volume= 3.288 af, Atten= 16%, Lag= 6.6 min
Primary = 38.95 cfs @ 12.30 hrs, Volume= 3.288 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 899.05' @ 12.30 hrs Surf.Area= 91,471 sf Storage= 57,060 cf

Plug-Flow detention time= 132.5 min calculated for 3.288 af (79% of inflow)
Center-of-Mass det. time= 53.6 min (855.1 - 801.5)

Volume	Invert	Avail.Storage	Storage Description
#1	898.00'	394,067 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
898.00	18,479	0	0
899.00	87,451	52,965	52,965
900.00	175,260	131,356	184,321
901.00	244,232	209,746	394,067

Device	Routing	Invert	Outlet Devices
#1	Primary	898.79'	**120.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=38.94 cfs @ 12.30 hrs HW=899.05' TW=891.36' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 38.94 cfs @ 1.27 fps)

Summary for Pond 2P: DA 2 Storage

Inflow Area = 4.310 ac, 1.86% Impervious, Inflow Depth > 5.91" for 100-Year Bulletin 70 event
Inflow = 36.33 cfs @ 12.02 hrs, Volume= 2.123 af
Outflow = 21.48 cfs @ 12.12 hrs, Volume= 1.904 af, Atten= 41%, Lag= 6.3 min
Primary = 2.51 cfs @ 12.12 hrs, Volume= 1.032 af
Routed to Pond 12P : DA 4 Storage
Secondary = 18.97 cfs @ 12.12 hrs, Volume= 0.871 af
Routed to Pond 12P : DA 4 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 898.08' @ 12.12 hrs Surf.Area= 48,783 sf Storage= 35,839 cf

Plug-Flow detention time= 149.3 min calculated for 1.903 af (90% of inflow)
Center-of-Mass det. time= 97.6 min (886.9 - 789.2)

Volume	Invert	Avail.Storage	Storage Description
#1	897.00'	178,312 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
897.00	17,532	0	0
898.00	46,772	32,152	32,152
899.00	72,833	59,803	91,955
900.00	99,882	86,358	178,312

Device	Routing	Invert	Outlet Devices
#1	Secondary	897.75'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	897.00'	**12.0" Round Culvert** L= 37.0' Ke= 0.500 Inlet / Outlet Invert= 897.00' / 896.25' S= 0.0203 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf

Primary OutFlow Max=2.51 cfs @ 12.12 hrs HW=898.08' TW=897.00' (Dynamic Tailwater)
↑—**2=Culvert** (Barrel Controls 2.51 cfs @ 3.70 fps)

Secondary OutFlow Max=18.96 cfs @ 12.12 hrs HW=898.08' TW=897.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 18.96 cfs @ 1.45 fps)

Summary for Pond 12P: DA 4 Storage

Inflow Area = 6.233 ac, 3.05% Impervious, Inflow Depth > 5.52" for 100-Year Bulletin 70 event
Inflow = 34.01 cfs @ 12.08 hrs, Volume= 2.870 af
Outflow = 3.99 cfs @ 13.01 hrs, Volume= 2.829 af, Atten= 88%, Lag= 55.8 min
Primary = 3.99 cfs @ 13.01 hrs, Volume= 2.829 af
Routed to Pond 20P : DA 3 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 20P : DA 3 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 897.66' @ 13.01 hrs Surf.Area= 41,654 sf Storage= 47,765 cf

Plug-Flow detention time= 118.5 min calculated for 2.829 af (99% of inflow)
Center-of-Mass det. time= 110.4 min (963.6 - 853.2)

Volume	Invert	Avail.Storage	Storage Description
#1	895.00'	194,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
895.00	931	0	0
896.00	11,904	6,418	6,418
897.00	26,038	18,971	25,389
898.00	49,659	37,849	63,237
900.00	81,153	130,812	194,049

Device	Routing	Invert	Outlet Devices
#1	Primary	895.00'	**12.0" Round Culvert** L= 40.0' Ke= 0.500 Inlet / Outlet Invert= 895.00' / 894.20' S= 0.0200 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	898.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.99 cfs @ 13.01 hrs HW=897.66' TW=892.23' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.99 cfs @ 5.08 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=895.00' TW=890.27' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 13P: DA 7 Storage

Inflow Area = 114.082 ac, 3.29% Impervious, Inflow Depth > 3.78" for 100-Year Bulletin 70 event
Inflow = 206.85 cfs @ 12.62 hrs, Volume= 35.908 af
Outflow = 96.82 cfs @ 13.30 hrs, Volume= 29.179 af, Atten= 53%, Lag= 40.8 min
Primary = 3.69 cfs @ 13.30 hrs, Volume= 3.789 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 93.12 cfs @ 13.30 hrs, Volume= 25.390 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 881.96' @ 13.30 hrs Surf.Area= 526,409 sf Storage= 632,165 cf

Plug-Flow detention time= 168.3 min calculated for 29.179 af (81% of inflow)
Center-of-Mass det. time= 88.3 min (940.1 - 851.8)

Volume	Invert	Avail.Storage	Storage Description
#1	879.00'	654,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
879.00	3,000	0	0
880.00	90,812	46,906	46,906
881.00	293,662	192,237	239,143
882.00	536,485	415,074	654,217

Device	Routing	Invert	Outlet Devices
#1	Primary	879.00'	**12.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 879.00' / 878.65' S= 0.0078 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	881.00'	**37.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.69 cfs @ 13.30 hrs HW=881.96' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.69 cfs @ 4.70 fps)

Secondary OutFlow Max=93.12 cfs @ 13.30 hrs HW=881.96' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 93.12 cfs @ 2.63 fps)

Summary for Pond 14P: DA 5 Storage

Inflow Area = 10.174 ac, 32.22% Impervious, Inflow Depth > 6.02" for 100-Year Bulletin 70 event
Inflow = 65.84 cfs @ 12.11 hrs, Volume= 5.101 af
Outflow = 4.88 cfs @ 16.30 hrs, Volume= 3.946 af, Atten= 93%, Lag= 251.1 min
Primary = 4.88 cfs @ 16.30 hrs, Volume= 3.946 af
Routed to Pond 17P : DA 6 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 17P : DA 6 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 889.19' Surf.Area= 53,842 sf Storage= 131,454 cf
Peak Elev= 890.74' @ 13.43 hrs Surf.Area= 123,587 sf Storage= 268,693 cf (137,239 cf above start)

Plug-Flow detention time= 700.4 min calculated for 0.928 af (18% of inflow)
Center-of-Mass det. time= 235.4 min (1,029.1 - 793.7)

Volume	Invert	Avail.Storage	Storage Description
#1	886.00'	525,760 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
886.00	30,908	0	0
887.00	40,872	35,890	35,890
889.00	45,276	86,148	122,038
891.00	135,445	180,721	302,759
892.10	270,011	223,001	525,760

Device	Routing	Invert	Outlet Devices
#1	Primary	889.18'	**15.0" Round Culvert** L= 138.0' Ke= 0.500 Inlet / Outlet Invert= 889.18' / 888.20' S= 0.0071 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf
#2	Secondary	892.00'	**73.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=4.89 cfs @ 16.30 hrs HW=890.56' TW=889.42' (Dynamic Tailwater)
1=Culvert (Outlet Controls 4.89 cfs @ 4.50 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=889.19' TW=886.93' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 17P: DA 6 Storage

Inflow Area = 22.919 ac, 26.39% Impervious, Inflow Depth > 5.35" for 100-Year Bulletin 70 event
Inflow = 84.61 cfs @ 12.11 hrs, Volume= 10.213 af
Outflow = 13.40 cfs @ 12.82 hrs, Volume= 9.451 af, Atten= 84%, Lag= 42.6 min
Primary = 13.03 cfs @ 12.82 hrs, Volume= 9.440 af
Routed to Link 2L : DA 8 >>> Discharge
Secondary = 0.37 cfs @ 12.82 hrs, Volume= 0.011 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 886.93' Surf.Area= 34,160 sf Storage= 67,514 cf
Peak Elev= 890.02' @ 12.82 hrs Surf.Area= 96,587 sf Storage= 213,504 cf (145,990 cf above start)

Plug-Flow detention time= 261.6 min calculated for 7.901 af (77% of inflow)
Center-of-Mass det. time= 108.0 min (994.4 - 886.4)

Volume	Invert	Avail.Storage	Storage Description
#1	884.00'	487,275 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
884.00	10,000	0	0
885.00	16,000	13,000	13,000
886.00	31,740	23,870	36,870
889.00	39,548	106,932	143,802
891.00	150,950	190,498	334,300
892.00	155,000	152,975	487,275

Device	Routing	Invert	Outlet Devices
#1	Primary	886.93'	**18.0" Round Culvert** L= 63.0' Ke= 0.500 Inlet / Outlet Invert= 886.93' / 884.76' S= 0.0344 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf
#2	Secondary	890.00'	**40.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=13.03 cfs @ 12.82 hrs HW=890.02' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 13.03 cfs @ 7.37 fps)

Secondary OutFlow Max=0.37 cfs @ 12.82 hrs HW=890.02' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.37 cfs @ 0.39 fps)

Summary for Pond 18P: DA 10 Storage

Inflow Area = 4.227 ac, 0.00% Impervious, Inflow Depth > 5.91" for 100-Year Bulletin 70 event
Inflow = 30.42 cfs @ 12.07 hrs, Volume= 2.080 af
Outflow = 19.59 cfs @ 12.20 hrs, Volume= 1.676 af, Atten= 36%, Lag= 7.6 min
Primary = 19.59 cfs @ 12.20 hrs, Volume= 1.676 af
Routed to Link 2L : DA 8 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 863.69' @ 12.20 hrs Surf.Area= 69,998 sf Storage= 34,315 cf

Plug-Flow detention time= 135.0 min calculated for 1.675 af (81% of inflow)
Center-of-Mass det. time= 57.9 min (851.1 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1	863.00'	3,373,778 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
863.00	29,607	0	0
864.00	88,227	58,917	58,917
895.00	125,635	3,314,861	3,373,778

Device	Routing	Invert	Outlet Devices
#1	Primary	863.40'	**50.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=19.58 cfs @ 12.20 hrs HW=863.69' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 19.58 cfs @ 1.36 fps)

Summary for Pond 19P: DA 11 Storage

Inflow Area = 1.538 ac, 18.86% Impervious, Inflow Depth > 6.02" for 100-Year Bulletin 70 event
Inflow = 10.31 cfs @ 12.11 hrs, Volume= 0.771 af
Outflow = 7.78 cfs @ 12.22 hrs, Volume= 0.769 af, Atten= 24%, Lag= 6.6 min
Primary = 2.94 cfs @ 12.22 hrs, Volume= 0.676 af
Routed to Link 15L : DA 9 >>> Discharge
Secondary = 4.84 cfs @ 12.22 hrs, Volume= 0.093 af
Routed to Link 15L : DA 9 >>> Discharge

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 864.19' @ 12.22 hrs Surf.Area= 8,878 sf Storage= 7,032 cf

Plug-Flow detention time= 18.7 min calculated for 0.768 af (100% of inflow)
Center-of-Mass det. time= 16.5 min (809.2 - 792.7)

Volume	Invert	Avail.Storage	Storage Description
#1	862.00'	17,715 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
862.00	100	0	0
863.00	2,048	1,074	1,074
864.00	6,912	4,480	5,554
865.00	17,409	12,161	17,715

Device	Routing	Invert	Outlet Devices
#1	Primary	862.00'	**12.0" Round Culvert** L= 38.0' Ke= 0.500 Inlet / Outlet Invert= 862.00' / 861.90' S= 0.0026 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	864.00'	**24.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=2.94 cfs @ 12.22 hrs HW=864.19' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.94 cfs @ 3.74 fps)

Secondary OutFlow Max=4.84 cfs @ 12.22 hrs HW=864.19' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 4.84 cfs @ 1.08 fps)

Summary for Pond 20P: DA 3 Storage

Inflow Area = 46.458 ac, 1.57% Impervious, Inflow Depth > 5.67" for 100-Year Bulletin 70 event
Inflow = 163.66 cfs @ 12.37 hrs, Volume= 21.965 af
Outflow = 3.20 cfs @ 24.00 hrs, Volume= 2.966 af, Atten= 98%, Lag= 697.6 min
Primary = 3.20 cfs @ 24.00 hrs, Volume= 2.966 af
Routed to Pond 13P : DA 7 Storage
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 13P : DA 7 Storage

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Starting Elev= 890.27' Surf.Area= 147,076 sf Storage= 237,670 cf
Peak Elev= 892.92' @ 24.00 hrs Surf.Area= 476,888 sf Storage= 1,065,249 cf (827,579 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 254.9 min (1,093.8 - 839.0)

Volume	Invert	Avail.Storage	Storage Description
#1	887.00'	1,151,208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
887.00	21,488	0	0
890.00	113,506	202,491	202,491
893.00	486,505	900,017	1,102,508
893.10	487,505	48,701	1,151,208

Device	Routing	Invert	Outlet Devices
#1	Primary	890.27'	**12.0" Round Culvert** L= 47.0' Ke= 0.500 Inlet / Outlet Invert= 890.27' / 890.13' S= 0.0030 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	893.00'	**13.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.20 cfs @ 24.00 hrs HW=892.92' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.20 cfs @ 4.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=890.27' TW=879.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 2L: DA 8 >>> Discharge

Inflow Area = 364.329 ac, 4.31% Impervious, Inflow Depth > 4.80" for 100-Year Bulletin 70 event
Inflow = 550.71 cfs @ 12.99 hrs, Volume= 145.750 af
Primary = 550.71 cfs @ 12.99 hrs, Volume= 145.750 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 4L: Proposed Discharge

Inflow Area = 379.969 ac, 4.47% Impervious, Inflow Depth > 4.84" for 100-Year Bulletin 70 event
Inflow = 561.22 cfs @ 12.98 hrs, Volume= 153.316 af
Primary = 561.22 cfs @ 12.98 hrs, Volume= 153.316 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 15L: DA 9 >>> Discharge

Inflow Area = 15.640 ac, 8.28% Impervious, Inflow Depth > 5.81" for 100-Year Bulletin 70 event
Inflow = 93.14 cfs @ 12.13 hrs, Volume= 7.566 af
Primary = 93.14 cfs @ 12.13 hrs, Volume= 7.566 af, Atten= 0%, Lag= 0.0 min
Routed to Link 4L : Proposed Discharge

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Appendix D: AIMA

STANDARD AGRICULTURAL IMPACT MITIGATION AGREEMENT
between
Cortland Illinois Solar LLC

and the
ILLINOIS DEPARTMENT OF AGRICULTURE
Pertaining to the Construction of a Commercial Solar Energy Facility
in
DeKalb County, Illinois

Pursuant to the Renewable Energy Facilities Agricultural Impact Mitigation Act (505 ILCS 147), the following standards and policies are required by the Illinois Department of Agriculture (IDOA) to help preserve the integrity of any Agricultural Land that is impacted by the Construction and Deconstruction of a Commercial Solar Energy Facility. They were developed with the cooperation of agricultural agencies, organizations, Landowners, Tenants, drainage contractors, and solar energy companies to comprise this Agricultural Impact Mitigation Agreement (AIMA).

Cortland Illinois Solar LLC, hereafter referred to as Commercial Solar Energy Facility Owner, or simply as Facility Owner, plans to develop and/or operate a 5MW Commercial Solar Energy Facility in DeKalb County [GPS Coordinates: 41.912139, -88.657194], which will consist of up to 35 acres that will be covered by solar facility related components, such as solar panel arrays, racking systems, access roads, an onsite underground collection system, inverters and transformers and any affiliated electric transmission lines. This AIMA is made and entered between the Facility Owner and the IDOA.

If Construction does not commence within four years after this AIMA has been fully executed, this AIMA shall be revised, with the Facility Owner's input, to reflect the IDOA's most current Solar Farm Construction and Deconstruction Standards and Policies. This AIMA, and any updated AIMA, shall be filed with the County Board by the Facility Owner prior to the commencement of Construction.

The below prescribed standards and policies are applicable to Construction and Deconstruction activities occurring partially or wholly on privately owned agricultural land.

Conditions of the AIMA

The mitigative actions specified in this AIMA shall be subject to the following conditions:

A. All Construction or Deconstruction activities may be subject to County or other local requirements. However, the specifications outlined in this AIMA shall be the minimum standards applied to all Construction or Deconstruction activities. IDOA may utilize any legal means to enforce this AIMA.

B. Except for Section 17. B. through F., all actions set forth in this AIMA are subject to modification through negotiation by Landowners and the Facility Owner, provided such changes are negotiated in advance of the respective Construction or Deconstruction activities.

C. The Facility Owner may negotiate with Landowners to carry out the actions that Landowners wish to perform themselves. In such instances, the Facility Owner shall offer Landowners the area commercial rate for their machinery and labor costs.

D. All provisions of this AIMA shall apply to associated future Construction, maintenance, repairs, and Deconstruction of the Facility referenced by this AIMA.

E. The Facility Owner shall keep the Landowners and Tenants informed of the Facility's Construction and Deconstruction status, and other factors that may have an impact upon their farming operations.

F. The Facility Owner shall include a statement of its adherence to this AIMA in any environmental assessment and/or environmental impact statement.

G. Execution of this AIMA shall be made a condition of any Conditional/Special Use Permit. Not less than 30 days prior to the commencement of Construction, a copy of this AIMA shall be provided by the Facility Owner to each Landowner that is party to an Underlying Agreement. In addition, this AIMA shall be incorporated into each Underlying Agreement.

H. The Facility Owner shall implement all actions to the extent that they do not conflict with the requirements of any applicable federal, state and local rules and regulations and other permits and approvals that are obtained by the Facility Owner for the Facility.

I. No later than 45 days prior to the Construction and/or Deconstruction of a Facility, the Facility Owner shall provide the Landowner(s) with a telephone number the Landowner can call to alert the Facility Owner should the Landowner(s) have questions or concerns with the work which is being done or has been carried out on his/her property.

J. If there is a change in ownership of the Facility, the Facility Owner assuming ownership of the Facility shall provide written notice within 90 days of ownership transfer, to the Department, the County, and to Landowners of such change. The Financial Assurance requirements and the other terms of this AIMA shall apply to the new Facility Owner.

K. The Facility Owner shall comply with all local, state and federal laws and regulations, specifically including the worker protection standards to protect workers from pesticide exposure.

L. Within 30 days of execution of this AIMA, the Facility Owner shall use Best Efforts to provide the IDOA with a list of all Landowners that are party to an Underlying Agreement and known Tenants of said Landowner who may be affected by the Facility. As the list of Landowners and Tenants is updated, the Facility Owner shall notify the IDOA of any additions or deletions.

M. If any provision of this AIMA is held to be unenforceable, no other provision shall be affected by that holding, and the remainder of the AIMA shall be interpreted as if it did not contain the unenforceable provision.

Definitions

Abandonment	When Deconstruction has not been completed within 12 months after the Commercial Solar Energy Facility reaches the end of its useful life. For purposes of this definition, a Commercial Solar Energy Facility shall be presumed to have reached the end of its useful life if the Commercial Solar Energy Facility Owner fails, for a period of 6 consecutive months, to pay the Landowner amounts owed in accordance with an Underlying Agreement.

Aboveground Cable	Electrical power lines installed above ground surface to be utilized for conveyance of power from the solar panels to the solar facility inverter and/or point of interconnection to utility grid or customer electric meter.
Agricultural Impact Mitigation Agreement (AIMA)	The Agreement between the Facility Owner and the Illinois Department of Agriculture (IDOA) described herein.
Agricultural Land	Land used for Cropland, hayland, pastureland, managed woodlands, truck gardens, farmsteads, commercial ag-related facilities, feedlots, livestock confinement systems, land on which farm buildings are located, and land in government conservation programs used for purposes as set forth above.
Best Efforts	Diligent, good faith, and commercially reasonable efforts to achieve a given objective or obligation.
Commercial Operation Date	The calendar date of which the Facility Owner notifies the Landowner, County, and IDOA in writing that commercial operation of the facility has commenced. If the Facility Owner fails to provide such notifications, the Commercial Operation Date shall be the execution date of this AIMA plus 6 months.
Commercial Solar Energy Facility (Facility)	A solar energy conversion facility equal to or greater than 500 kilowatts in total nameplate capacity, including a solar energy conversion facility seeking an extension of a permit to construct granted by a county or municipality before June 29, 2018. "Commercial solar energy facility" does not include a solar energy conversion facility: (1) for which a permit to construct has been issued before June 29, 2018; (2) that is located on land owned by the commercial solar energy facility owner; (3) that was constructed before June 29, 2018; or (4) that is located on the customer side of the customer's electric meter and is primarily used to offset that customer's electricity load and is limited in nameplate capacity to less than or equal to 2,000 kilowatts.
Commercial Solar Energy Facility Owner deemed (Facility Owner)	A person or entity that owns a commercial solar energy facility. A Commercial Solar Energy Facility Owner is not nor shall it be to be a public utility as defined in the Public Utilities Act.
County	The County or Counties where the Commercial Solar Energy Facility is located.
Construction	The installation, preparation for installation and/or repair of a Facility.
Cropland	Land used for growing row crops, small grains or hay; includes land which was formerly used as cropland, but is currently enrolled in a government conservation program; also includes pastureland that is classified as Prime Farmland.

Deconstruction	The removal of a Facility from the property of a Landowner and the restoration of that property as provided in the AIMA.
Deconstruction Plan	A plan prepared by a Professional Engineer, at the Facility's expense, that includes: (1) the estimated Deconstruction cost, in current dollars at the time of filing, for the Facility, considering among other things: i. the number of solar panels, racking, and related facilities involved; ii. the original Construction costs of the Facility; iii. the size and capacity, in megawatts of the Facility; iv. the salvage value of the facilities (if all interests in salvage value are subordinate to that of the Financial Assurance holder if abandonment occurs); v. the Construction method and techniques for the Facility and for other similar facilities; and (2) a comprehensive detailed description of how the Facility Owner plans to pay for the Deconstruction of the Facility.
Department	The Illinois Department of Agriculture (IDOA).
Financial Assurance	A reclamation or surety bond or other commercially available financial assurance that is acceptable to the County, with the County or Landowner as beneficiary.
Landowner	Any person with an ownership interest in property that is used for agricultural purposes and that is party to an Underlying Agreement.
Prime Farmland	Agricultural Land comprised of soils that are defined by the USDA Natural Resources Conservation Service (NRCS) as "Prime Farmland" (generally considered to be the most productive soils with the least input of nutrients and management).
Professional Engineer	An engineer licensed to practice engineering in the State of Illinois.
Soil and Water Conservation District (SWCD)	A unit of local government that provides technical and financial assistance to eligible Landowners for the conservation of soil and water resources.
Tenant	Any person, apart from the Facility Owner, lawfully residing or leasing/renting land that is subject to an Underlying Agreement.
Topsoil	The uppermost layer of the soil that has the darkest color or the highest content of organic matter; more specifically, it is defined as the "A" horizon.
Underlying Agreement	The written agreement between the Facility Owner and the Landowner(s) including, but not limited to, an easement, option, lease, or license under the terms of which another person has constructed, constructs, or intends to construct a Facility on the property of the Landowner.

Underground Cable	Electrical power lines installed below the ground surface to be utilized for conveyance of power within a Facility or from a Commercial Solar Energy Facility to the electric grid.
USDA Natural Resources Conservation Service (NRCS)	An agency of the United States Department of Agriculture that provides America's farmers with financial and technical assistance to aid with natural resources conservation.

Construction and Deconstruction Standards and Policies

1. Support Structures

A. Only single pole support structures shall be used for the Construction and operation of the Facility on Agricultural Land. Other types of support structures, such as lattice towers or H-frames, may be used on nonagricultural land.

B. Where a Facility's Aboveground Cable will be adjacent and parallel to highway and/or railroad right-of-way, but on privately owned property, the support structures shall be placed as close as reasonably practicable and allowable by the applicable County Engineer or other applicable authorities to the highway or railroad right-of-way. The only exceptions may be at jogs or weaves on the highway alignment or along highways or railroads where transmission and distribution lines are already present.

C. When it is not possible to locate Aboveground Cable next to highway or railroad right-of-way, Best Efforts shall be expended to place all support poles in such a manner to minimize their placement on Cropland (i.e., longer than normal above ground spans shall be utilized when traversing Cropland).

2. Aboveground Facilities

Locations for facilities shall be selected in a manner that is as unobtrusive as reasonably possible to ongoing agricultural activities occurring on the land that contains or is adjacent to the Facility.

3. Guy Wires and Anchors

Best Efforts shall be made to place guy wires and their anchors, if used, out of Cropland, pastureland and hayland, placing them instead along existing utilization lines and on land other than Cropland. Where this is not feasible, Best Efforts shall be made to minimize guy wire impact on Cropland. All guy wires shall be shielded with highly visible guards.

4. Underground Cabling Depth

A. Underground electrical cables located outside the perimeter of the (fence) of the solar panels shall be buried with:

1. a minimum of 5 feet of top cover where they cross Cropland.
2. a minimum of 5 feet of top cover where they cross pastureland or other non-Cropland classified as Prime Farmland.
3. a minimum of 3 feet of top cover where they cross pastureland and other Agricultural Land not classified as Prime Farmland.

4. a minimum of 3 feet of top cover where they cross wooded/brushy land.

B. Provided that the Facility Owner removes the cables during Deconstruction, underground electric cables may be installed to a minimum depth of 18 inches:

1. Within the fenced perimeter of the Facility; or

2. When buried under an access road associated with the Facility provided that the location and depth of cabling is clearly marked at the surface.

C. If Underground Cables within the fenced perimeter of the solar panels are installed to a minimum depth of 5 feet, they may remain in place after Deconstruction.

5. Topsoil Removal and Replacement

A. Any excavation shall be performed in a manner to preserve topsoil. Best Efforts shall be made to store the topsoil near the excavation site in such a manner that it will not become intermixed with subsoil materials.

B. Best Efforts shall be made to store all disturbed subsoil material near the excavation site and separate from the topsoil.

C. When backfilling an excavation site, Best Efforts shall be used to ensure the stockpiled subsoil material will be placed back into the excavation site before replacing the topsoil.

D. Refer to Section 7 for procedures pertaining to rock removal from the subsoil and topsoil.

E. Refer to Section 8 for procedures pertaining to the repair of compaction and rutting of the topsoil.

F. Best Efforts shall be performed to place the topsoil in a manner so that after settling occurs, the topsoil's original depth and contour will be restored as close as reasonably practicable. The same shall apply where excavations are made for road, stream, drainage ditch, or other crossings. In no instance shall the topsoil materials be used for any other purpose unless agreed to explicitly and in writing by the Landowner.

G. Based on the mutual agreement of the landowner and Facility Owner, excess soil material resulting from solar facility excavation shall either be removed or stored on the Landowner's property and reseeded per the applicable National Pollution Discharge Elimination System (NPDES) permit/Stormwater Pollution Prevention Plan (SWPPP). After the Facility reaches the end of its Useful Life, the excess subsoil material shall be returned to an excavation site or removed from the Landowner's property, unless otherwise agreed to by Landowner.

6. Rerouting and Permanent Repair of Agricultural Drainage Tiles

The following standards and policies shall apply to underground drainage tile line(s) directly or indirectly affected by Construction and/or Deconstruction:

A. Prior to Construction, the Facility Owner shall work with the Landowner to identify drainage tile lines traversing the property subject to the Underlying Agreement to the extent reasonably practicable. All drainage tile lines identified in this manner shall be shown on the Construction and Deconstruction Plans.

B. The location of all drainage tile lines located adjacent to or within the footprint of the Facility shall be recorded using Global Positioning Systems (GPS) technology. Within 60 days after Construction is complete, the Facility Owner shall provide the Landowner, the IDOA, and the respective County Soil and Water Conservation District (SWCD) with "as built" drawings (strip maps) showing the location of all drainage tile lines by survey station encountered in the Construction of the Facility, including any tile line repair location(s), and any underground cable installed as part of the Facility.

C. **Maintaining Surrounding Area Subsurface Drainage**

If drainage tile lines are damaged by the Facility, the Facility Owner shall repair the lines or install new drainage tile line(s) of comparable quality and cost to the original(s), and of sufficient size and appropriate slope in locations that limit direct impact from the Facility. If the damaged tile lines cause an unreasonable disruption to the drainage system, as determined by the Landowner, then such repairs shall be made promptly to ensure appropriate drainage. Any new line(s) may be located outside of, but adjacent to the perimeter of the Facility. Disrupted adjacent drainage tile lines shall be attached thereto to provide an adequate outlet for the disrupted adjacent tile lines.

D. **Re-establishing Subsurface Drainage Within Facility Footprint**

Following Deconstruction and using Best Efforts, if underground drainage tile lines were present within the footprint of the facility and were severed or otherwise damaged during original Construction, facility operation, and/or facility Deconstruction, the Facility Owner shall repair existing drainage tiles or install new drainage tile lines of comparable quality and cost to the original, within the footprint of the Facility with sufficient capacity to restore the underground drainage capacity that existed within the footprint of the Facility prior to Construction. Such installation shall be completed within 12 months after the end of the useful life of the Facility and shall be compliant with Figures 1 and 2 to this Agreement or based on prudent industry standards if agreed to by Landowner.

E. If there is any dispute between the Landowner and the Facility Owner on the method of permanent drainage tile line repair, the appropriate County SWCD's opinion shall be considered by the Facility Owner and the Landowner.

F. During Deconstruction, all additional permanent drainage tile line repairs beyond those included above in Section 6.D. must be made within 30 days of identification or notification of the damage, weather and soil conditions permitting. At other times, such repairs must be made at a time mutually agreed upon by the Facility Owner and the Landowner. If the Facility Owner and Landowner cannot agree upon a reasonable method to complete this restoration, the Facility Owner may implement the recommendations of the appropriate County SWCD and such implementation constitutes compliance with this provision.

G. Following completion of the work required pursuant to this Section, the Facility Owner shall be responsible for correcting all drainage tile line repairs that fail due to Construction and/or Deconstruction for one year following the completion of Construction or Deconstruction, provided those repairs were made by the Facility Owner. The Facility Owner shall not be responsible for drainage tile repairs that the Facility Owner pays the Landowner to perform.

7. Rock Removal

With any excavations, the following rock removal procedures pertain only to rocks found in the uppermost 42 inches of soil, the common freeze zone in Illinois, which emerged or were brought to the site as a result of Construction and/or Deconstruction.

A. Before replacing any topsoil, Best Efforts shall be taken to remove all rocks greater than 3 inches in any dimension from the surface of exposed subsoil which emerged or were brought to the site as a result of Construction and/or Deconstruction.

B. If trenching, blasting, or boring operations are required through rocky terrain, precautions shall be taken to minimize the potential for oversized rocks to become interspersed in adjacent soil material.

C. Rocks and soil containing rocks removed from the subsoil areas, topsoil, or from any excavations, shall be removed from the Landowner's premises or disposed of on the Landowner's premises at a location that is mutually acceptable to the Landowner and the Facility Owner.

8. Repair of Compaction and Rutting

A. Unless the Landowner opts to do the restoration work on compaction and rutting, after the topsoil has been replaced post-Deconstruction, all areas within the boundaries of the Facility that were traversed by vehicles and Construction and/or Deconstruction equipment that exhibit compaction and rutting shall be restored by the Facility Owner. All prior Cropland shall be ripped at least 18 inches deep or to the extent practicable, and all pasture and woodland shall be ripped at least 12 inches deep or to the extent practicable. The existence of drainage tile lines or underground utilities may necessitate less ripping depth. The disturbed area shall then be disked.

B. All ripping and disking shall be done at a time when the soil is dry enough for normal tillage operations to occur on Cropland adjacent to the Facility.

C. The Facility Owner shall restore all rutted land to a condition as close as possible to its original condition upon Deconstruction, unless necessary earlier as determined by the Landowner.

D. If there is any dispute between the Landowner and the Facility Owner as to what areas need to be ripped/disked or the depth at which compacted areas should be ripped/disked, the appropriate County SWCD's opinion shall be considered by the Facility Owner and the Landowner.

9. Construction During Wet Weather

Except as provided below, construction activities are not allowed on agricultural land during times when normal farming operations, such as plowing, disking, planting or harvesting, cannot take place due to excessively wet soils. With input from the landowner, wet weather conditions may be determined on a field by field basis.

A. Construction activities on prepared surfaces, surfaces where topsoil and subsoil have been removed, heavily compacted in preparation, or otherwise stabilized (e.g. through cement mixing) may occur at the discretion of the Facility Owner in wet weather conditions.

B. Construction activities on unprepared surfaces will be done only when work will not result in rutting which may mix subsoil and topsoil. Determination as to the potential of subsoil and topsoil mixing will be made in consultation with the underlying Landowner, or, if approved by the Landowner, his/her designated tenant or designee.

10. Prevention of Soil Erosion

A. The Facility Owner shall work with Landowners and create and follow a SWPPP to prevent excessive erosion on land that has been disturbed by Construction or Deconstruction of a Facility.

B. If the Landowner and Facility Owner cannot agree upon a reasonable method to control erosion on the Landowner's property, the Facility Owner shall consider the recommendations of the appropriate County SWCD to resolve the disagreement.

C. The Facility Owner may, per the requirements of the project SWPPP and in consultation with the Landowner, seed appropriate vegetation around all panels and other facility components to prevent erosion. The Facility Owner must utilize Best Efforts to ensure that all seed mixes will be as free of any noxious weed seeds as possible. The Facility Owner shall consult with the Landowner regarding appropriate varieties to seed.

11. Repair of Damaged Soil Conservation Practices

Consultation with the appropriate County SWCD by the Facility Owner shall be carried out to determine if there are soil conservation practices (such as terraces, grassed waterways, etc.) that will be damaged by the Construction and/or Deconstruction of the Facility. Those conservation practices shall be restored to their preconstruction condition as close as reasonably practicable following Deconstruction in accordance with USDA NRCS technical standards. All repair costs shall be the responsibility of the Facility Owner.

12. Compensation for Damages to Private Property

The Facility Owner shall reasonably compensate Landowners for damages caused by the Facility Owner. Damage to Agricultural Land shall be reimbursed to the Landowner as prescribed in the applicable Underlying Agreement.

13. Clearing of Trees and Brush

A. If trees are to be removed for the Construction or Deconstruction of a Facility, the Facility Owner shall consult with the Landowner to determine if there are trees of commercial or other value to the Landowner.

B. If there are trees of commercial or other value to the Landowner, the Facility Owner shall allow the Landowner the right to retain ownership of the trees to be removed and the disposition of the removed trees shall be negotiated prior to the commencement of land clearing.

14. Access Roads

A. To the extent practicable, access roads shall be designed to not impede surface drainage and shall be built to minimize soil erosion on or near the access roads.

B. Access roads may be left intact during Construction, operation or Deconstruction through mutual agreement of the Landowner and the Facility Owner unless otherwise restricted by federal, state, or local regulations.

C. If the access roads are removed, Best Efforts shall be expended to assure that the land shall be restored to equivalent condition(s) as existed prior to their construction, or as otherwise agreed to by the Facility Owner and the Landowner. All access roads that are removed shall be ripped to a depth of 18 inches. All ripping shall be performed consistent with Section 8.

15. Weed/Vegetation Control

A. The Facility Owner shall provide for weed control in a manner that prevents the spread of weeds. Chemical control, if used, shall be done by an appropriately licensed pesticide applicator.

B. The Facility Owner shall be responsible for the reimbursement of all reasonable costs incurred by owners of agricultural land where it has been determined by the appropriate state or county entity that weeds have spread from the Facility to their property. Reimbursement is contingent upon written notice to the Facility Owner. Facility Owner shall reimburse the property owner within 45 days after notice is received.

C. The Facility Owner shall ensure that all vegetation growing within the perimeter of the Facility is properly and appropriately maintained. Maintenance may include, but not be limited to, mowing, trimming, chemical control, or the use of livestock as agreed to by the Landowner.

D. The Deconstruction plans must include provisions for the removal of all weed control equipment used in the Facility, including weed-control fabrics or other ground covers.

16. Indemnification of Landowners

The Facility Owner shall indemnify all Landowners, their heirs, successors, legal representatives, and assigns from and against all claims, injuries, suits, damages, costs, losses, and reasonable expenses resulting from or arising out of the Commercial Solar Energy Facility, including Construction and Deconstruction thereof, and also including damage to such Facility or any of its appurtenances, except where claims, injuries, suits, damages, costs, losses, and expenses are caused by the negligence or intentional acts, or willful omissions of such Landowners, and/or the Landowners heirs, successors, legal representatives, and assigns.

17. Deconstruction Plans and Financial Assurance of Commercial Solar Energy Facilities

A. Deconstruction of a Facility shall include the removal/disposition of all solar related equipment/facilities, including the following utilized for operation of the Facility and located on Landowner property:

1. Solar panels, cells and modules;
2. Solar panel mounts and racking, including any helical piles, ground screws, ballasts, or other anchoring systems;
3. Solar panel foundations, if used (to depth of 5 feet);

4. Transformers, inverters, energy storage facilities, or substations, including all components and foundations; however, Underground Cables at a depth of 5 feet or greater may be left in place;
5. Overhead collection system components;
6. Operations/maintenance buildings, spare parts buildings and substation/switching gear buildings unless otherwise agreed to by the Landowner;
7. Access Road(s) unless Landowner requests in writing that the access road is to remain;
8. Operation/maintenance yard/staging area unless otherwise agreed to by the Landowner; and
9. Debris and litter generated by Deconstruction and Deconstruction crews.

B. The Facility Owner shall, at its expense, complete Deconstruction of a Facility within twelve (12) months after the end of the useful life of the Facility.

C. During the County permit process, or if none, then prior to the commencement of construction, the Facility Owner shall file with the County a Deconstruction Plan. The Facility Owner shall file an updated Deconstruction Plan with the County on or before the end of the tenth year of commercial operation.

D. The Facility Owner shall provide the County with Financial Assurance to cover the estimated costs of Deconstruction of the Facility. Provision of this Financial Assurance shall be phased in over the first 11 years of the Project's operation as follows:

1. On or before the first anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover ten (10) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
2. On or before the sixth anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover fifty (50) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
3. On or before the eleventh anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover one hundred (100) percent of the estimated costs of Deconstruction of the Facility as determined in the updated Deconstruction Plan provided during the tenth year of commercial operation.

The Financial Assurance shall not release the surety from liability until the Financial Assurance is replaced. The salvage value of the Facility may only be used to reduce the estimated costs of Deconstruction if the County agrees that all interests in the salvage value are subordinate or have been subordinated to that of the County if Abandonment occurs.

E. The County may, but is not required to, reevaluate the estimated costs of Deconstruction of any Facility after the tenth anniversary, and every five years thereafter, of the Commercial Operation Date. Based on any reevaluation, the County may require changes in the level of Financial Assurance used to calculate the phased Financial Assurance levels described in Section 17.D. required from the Facility Owner. If the County is unable to its satisfaction to perform the investigations necessary to approve the Deconstruction Plan filed by the Facility Owner, then the County and Facility may mutually agree on the selection of a Professional Engineer independent of the Facility Owner to conduct any necessary investigations. The Facility Owner shall be responsible for the cost of any such investigations.

F. Upon Abandonment, the County may take all appropriate actions for Deconstruction including drawing upon the Financial Assurance.

Concurrence of the Parties to this AIMA

The Illinois Department of Agriculture and Cortland Illinois Solar LLC concur that this AIMA is the complete AIMA governing the mitigation of agricultural impacts that may result from the Construction and Deconstruction of the solar farm project in DeKalb County within the State of Illinois.

The effective date of this AIMA commences on the date of execution.

STATE OF ILLINOIS
DEPARTMENT OF AGRICULTURE

Jerry Costello II

By: Jerry Costello II, Director

Clay Nordsiek

By Clay Nordsiek, Deputy General Counsel

801 E. Sangamon Avenue,
State Fairgrounds, POB 19281
Springfield, IL 62794-9281

5/15, 2024

Cortland Illinois Solar LLC

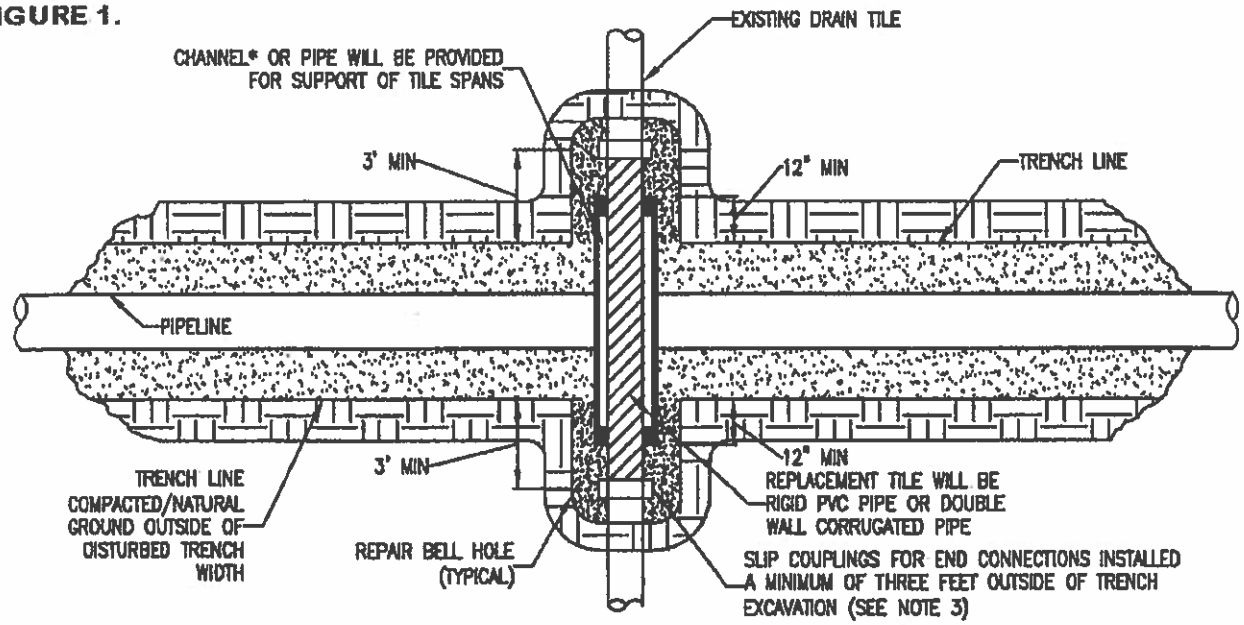
By Kaya Tarhan, CEO

1083 N Collier Blvd #408

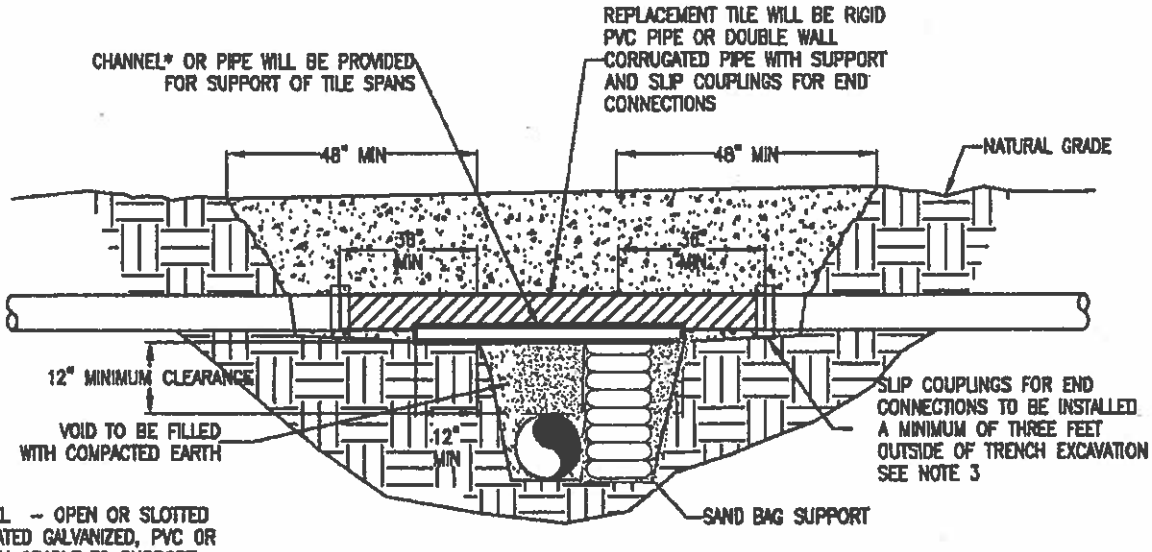
Address

March 28th, 2024

FIGURE 1.



PLAN
N.T.S.



*CHANNEL – OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE TO SUPPORT DRAIN TILE.

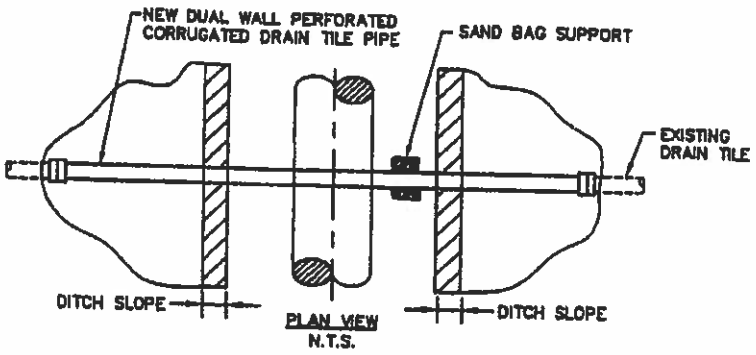
CROSS SECTION
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NOTE:

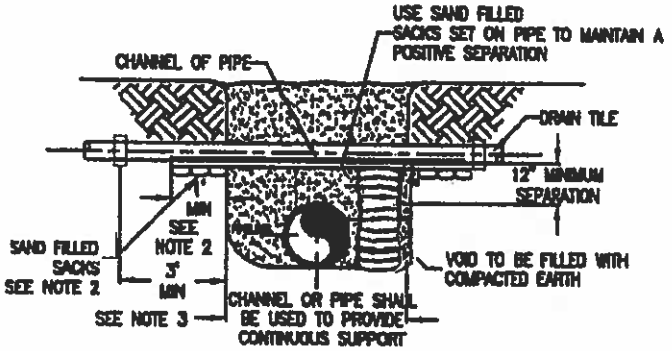
1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING. IF NO WATER IS FLOWING AND TEMPORARY REPAIR IS DELAYED, OR NOT MADE BY THE END OF THE WORK DAY, A SCREEN OR APPROPRIATE 'NIGHT CAP' SHALL BE PLACED ON OPEN ENDS OF TILE TO PREVENT ENTRAPMENT OF ANIMALS ETC.
2. CHANNEL OR PIPE (OPEN OR SLOTTED) MADE OF CORRUGATED GALVANIZED PIPE, PVC OR ALUMINUM WILL BE USED FOR SUPPORT OF DRAIN TILE SPANS.
3. INDUSTRY STANDARDS SHALL BE FOLLOWED TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES.

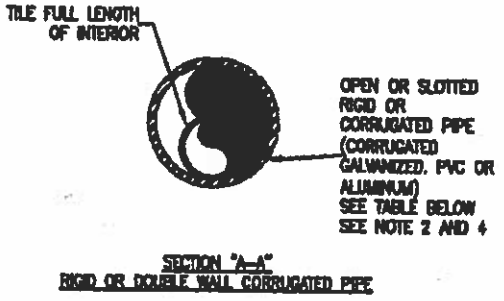
TEMPORARY DRAIN TILE REPAIR

FIGURE 2.



PLAN VIEW





END VIEWS

MINIMUM SUPPORT TABLE				
TILE SIZE	CHANNEL SIZE		PIPE SIZE	
3"	4" @ 5.4	#/ft	4"	STD. WT.
4"-5"	5" @ 6.7	#/ft	6"	STD. WT.
8"-9"	7" @ 9.8	#/ft	9"-10"	STD. WT.
10"	10" @ 15.3	#/ft	12"	STD. WT.

NOTE:

1. TILE REPAIR AND REPLACEMENT SHALL MAINTAIN ORIGINAL ALIGNMENT GRADIENT AND WATER FLOW TO THE GREATEST EXTENT POSSIBLE. IF THE TILE NEEDS TO BE RELOCATED, THE INSTALLATION ANGLE MAY VARY DUE TO SITE SPECIFIC CONDITIONS AND LANDOWNER RECOMMENDATIONS.

2. 1'-0" MINIMUM LENGTH OF CHANNEL OR RIGID PIPE (OPEN OR SLOTTED CORRUGATED GALVANIZED, PVC OR ALUMINUM CRADLE) SHALL BE SUPPORTED BY UNDISTURBED SOIL, OR IF CROSSING IS NOT AT RIGHT ANGLES TO PIPELINE, EQUIVALENT LENGTH PERPENDICULAR TO TRENCH. SHIM WITH SAND BAGS TO UNDISTURBED SOIL FOR SUPPORT AND DRAINAGE GRADIENT MAINTENANCE (TYPICAL BOTH SIDES).

3. DRAIN TILES WILL BE PERMANENTLY CONNECTED TO EXISTING DRAIN TILES A MINIMUM OF THREE FEET OUTSIDE OF EXCAVATED TRENCH LINE USING INDUSTRY STANDARDS TO ENSURE PROPER SEAL OF REPAIRED DRAIN TILES INCLUDING SLIP COUPLINGS.

4. DIAMETER OF RIGID PIPE SHALL BE OF ADEQUATE SIZE TO ALLOW FOR THE INSTALLATION OF THE TILE FOR THE FULL LENGTH OF THE RIGID PIPE.

5. OTHER METHODS OF SUPPORTING DRAIN TILE MAY BE USED IF ALTERNATE PROPOSED IS EQUIVALENT IN STRENGTH TO THE CHANNEL/PIPE SECTIONS SHOWN AND IF APPROVED BY COMPANY REPRESENTATIVES AND LANDOWNER IN ADVANCE. SITE SPECIFIC ALTERNATE SUPPORT SYSTEM TO BE DEVELOPED BY COMPANY REPRESENTATIVES AND FURNISHED TO CONTRACTOR FOR SPANS IN EXCESS OF 20', TILE GREATER THEN 10" DIAMETER, AND FOR "HEADER" SYSTEMS.

6. ALL MATERIAL TO BE FURNISHED BY CONTRACTOR.

7. PRIOR TO REPAIRING TILE, CONTRACTOR SHALL PROBE LATERALLY INTO THE EXISTING TILE TO FULL WIDTH OF THE RIGHTS OF WAY TO DETERMINE IF ADDITIONAL DAMAGE HAS OCCURRED. ALL DAMAGED/DISTURBED TILE SHALL BE REPAIRED AS NEAR AS PRACTICABLE TO ITS ORIGINAL OR BETTER CONDITION.

PERMANENT DRAIN TILE REPAIR

Appendix E: Critical Issues Analysis

SOLARSTONE

CRITICAL ISSUES ANALYSIS
CORTLAND ILLINOIS SOLAR PROJECT

CORTLAND ILLINOIS SOLAR

DEKALB COUNTY, ILLINOIS

June 17, 2024

Prepared for:
Cortland Solar LLC

WSB PROJECT NO. 024543-000

wsb

TABLE OF CONTENTS

Executive Summary 1
Introduction and Purpose 1
1.1 Project Description 1
1.2 Purpose 4
Methods 5
Results 6
1.3 Topography 6
1.4 Land Use 8
1.5 Zoning and Special Considerations 10
Zoning 10
Special Considerations 10
1.6 Soils 12
1.7 Surficial Hydrological Resources 16
1.8 National Pipeline Mapping System 18
1.9 Biological Resources 18
Illinois Department of Natural Resources Ecological Compliance Assessment Tool 18
Federally Protected Species 18
Indiana bat (*Myotis sodalis*) 18
Northern long-eared bat (*Myotis septentrionalis*) 19
Tricolored bat (*Perimyotis subflavus*) 19
Monarch butterfly (*Danaus plexippus*) 19
Rusty patched bumble bee (*Bombus affinis*) 19
Whooping crane (*Grus americana*) 22
Bald eagle (*Haliaeetus leucocephalus*) 22
Eastern prairie fringed orchid (*Platanthera leucophaea*) 22
1.10 Special Management Areas 22
1.11 Archaeological, Cultural, and Historical Resources 23
References 24

FIGURES

Figure 1 – Project Location (Street)
Figure 2 – Project Location (Aerial)
Figure 3 – Topography
Figure 4 – Land Cover (NLCD)
Figure 5 – Karst Features
Figure 6 – Soils – Hydric Rating
Figure 7 – Soils – Farmland Classification
Figure 8 – Surficial Hydrological Resources
Figure 9 – Rusty Patched Bumble Bee Potential Zone

TABLES

Table 1 – Critical Issues Analysis Summary
Table 2 – Land Use
Table 3 – Soil types and their respective coverages.
Table 4 – Farmland classifications and their respective coverages

APPENDICES

A – Federal Aviation Administration Notice Criteria Tool Results
B – National Pipeline Mapping System Results
C – Illinois Department of Natural Resources Ecological Compliance Assessment Tool Results
D – U.S. Fish and Wildlife Service Information for Planning and Consultation Report

Executive Summary

Seven potential constraints were identified for the project area that may need further assessment or avoidance/minimization measures (**Table 1**). Please note that when a resource is assigned a possible issue designation, it indicates an issue may be present if certain conditions are met (e.g., tree removal, project is federally funded or permitted, et cetera). If those conditions are not met, then no issues are identified for that resource.

Table 1 - Critical Issues Analysis Summary

Resource	Issue Present (Yes, Possible, No)	Comments
Topography	No	Topographic relief is moderate.
Zoning	Yes	The project area is proposed to be annexed into the Town of Cortland in the AG, agricultural district. The proposed solar energy facility is permitted in the AG district of the Town of Cortland with a Special Use Permit and subsequent building permit. The town ordinance requires that equipment be set back a minimum of 50 feet (ft) (15.2 meters [m]) from all nonparticipating property lines. The height of solar panels, cells, or modules while at full tilt may not exceed 10 ft (3.05 m). The site must be enclosed and secured with a fence with a minimum height of 6 ft (1.8 m). Keys shall be provided at locked entrances for access by appropriate emergency personnel. The proposed solar energy facility must comply with any applicable state and federal requirements including but not limited to the National Electric Code, Occupational Safety and Health Association regulations, and FAA requirements. A building permit is required prior to construction and after Special Use Permit approval.
Federal Aviation Administration	No	The Federal Aviation Administration (FAA) Notice Criteria Tool indicates that no further coordination with the FAA is required.
Electrical Transmission Lines	No	Based on the U.S. Energy Information Administration mapping system and the U.S. Electric Power Transmission Lines, there were no electric transmission lines (i.e., 69 kilovolts [kV] or more) within the project area or within one mile (1.6 km) of the project area.

Resource	Issue Present (Yes, Possible, No)	Comments
Karst Features, Sinkholes, and Mines	Possible	Based on the U.S. Geological Survey (USGS) USA Karsts, no karst features are within the project area. A carbonate limestone karst feature is within one mile (1.6km) of the project area. No sinkholes or mines were located within the project area or within one mile (1.6 km) of the project area. Geotechnical analysis recommended for the project area. The results of the geotechnical analysis will guide further actions, if necessary.
Soils	Possible	Based on the U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Service, most soils within the project area were comprised of silt loams (73.3 percent). Approximately 26.7 percent of the project area was comprised of hydric soils. Most of the project area was classified as prime farmland (55.6 percent) followed by prime farmland if drained (44.5 percent). A stormwater or groundwater management plan demonstrating best management practices, with erosion and sediment control provisions is recommended. Geotechnical analysis recommended for the project area. The results of the geotechnical analysis will guide further actions, if necessary.
Surficial Hydrological Resources	Yes	Based on the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory, a riverine wetland (R2UBHx) is mapped within the project area. A USGS National Hydrography Dataset flowline is mapped within the project area, and it corresponds with the riverine wetland within the project area. Also, a 100 Year (Zone A) Federal Emergency Management Agency flood zone was identified within the project area and is associated with the USGS flowline. A Level 1 wetland delineation (desktop review) identified three possible wetlands within the project area. A Level 2 wetland delineation (field verification) is recommended to evaluate the potential wetlands within the project area. A stormwater or groundwater management plan demonstrating best management practices, with erosion and sediment control provisions is recommended.

Resource	Issue Present (Yes, Possible, No)	Comments
Pipelines	Yes	Based on the U.S. Department of Transportation National Pipeline Mapping System Public Map Viewer, there was a natural gas pipeline (Pipeline ID M500-1) mapped within the project area. The natural gas pipeline is owned by Guardian Pipeline, LLC. No other natural gas pipelines were mapped within one mile (1.6 km) of the project area. There were no hazardous liquid pipelines, liquefied natural gas plants, or breakout tanks within the project area or within one mile (1.6 km) of the project area.
Biological Resources	Possible	The Illinois Department of Natural Resources Ecological Compliance Assessment Tool indicated there were no records of state listed species, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves identified in the vicinity of the project location. As such, consultation was terminated. The termination is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been constructed within two years of the date of the termination letter, or any of the above-listed conditions develop, a new consultation is necessary. Based on the USFWS Information for Planning and Consultation, the federally endangered Indiana bat (*Myotis sodalis*), federally endangered northern long-eared bat (*Myotis septentrionalis*), federally threatened eastern prairie fringed orchid (*Platanthera leucophaea*), proposed endangered tricolored bat (*Perimyotis subflavus*), non-essential experimental population of whooping crane, and monarch butterfly (*Danaus plexippus*), a candidate for federal listing may occur within the project area or surrounding region. The Indiana bat and eastern prairie fringed orchid are state endangered. The federally endangered rusty patched bumble bee (*Bombus affinis*) is included here due to the proximity of the project area to the USFWS rusty patched bumble bee Low Potential Zone. Also, the bald eagle (*Haliaeetus leucocephalus*) is included here due to being protected under the Bald and Golden Eagle

Resource	Issue Present (Yes, Possible, No)	Comments
		Protection Act (BGEPA) and the species' range encompasses the project area. Although a limited amount of potentially suitable habitat for the monarch butterfly may be available within the project area, its status does not afford them or their habitats legal protection. Also, although there is potentially suitable tricolored bat habitat within the project area, its status does not afford them or their habitats legal protection. Note that the USFWS is expected to decide on the proposed status of the monarch butterfly and tricolored bat in 2024. If they are listed, there may be species specific guidelines. The USFWS released draft tricolored bat guidelines that may be implemented if it is listed. Although there appears to be suitable rusty patched bumble bee habitat within the project area, the project area is outside of the USFWS High Potential Zone. As such, no avoidance or minimization measures or surveys are needed for this species. Although there is potentially suitable whooping crane stop-over habitat within the project area, the proximity to State Route 38 and the Chicago and North Western railroad suggests that they are unlikely to use it. Also, take prohibitions and USFWS consultation requirements are relaxed for non-essential, experimental populations. Potentially suitable habitat for the Indiana bat, bald eagle, and eastern prairie fringed orchid occurs within the project area. Potentially suitable habitat for the northern long-eared bat occurs within the project area, but the project does not involve wind turbine operations so USFWS notes the species does not need to be considered. If tree removal occurs during project construction within the timelines outlined below, it may require surveys or avoidance windows for nesting birds protected under the Migratory Bird Treaty Act

Resource	Issue Present (Yes, Possible, No)	Comments
		(MBTA), Bald and Golden Eagle Protection Act, or habitat assessments for the Indiana bat and northern long-eared bat. Also, if impacts to wetlands occur it may require surveys or avoidance windows for the eastern prairie fringed orchid or nesting birds protected under the MBTA. For reference: • the typical nesting season for birds in Illinois is April through August; • the typical nesting season for bald eagles in Illinois is January through August. Please note that this is only a concern if construction activities occur within 660 ft (201 m) of an active bald eagle nest; and • the active season for Indiana bats is April 1 through November 15. If tree removal is planned for the project, it is strongly recommended to complete all tree removal between November 16 and March 31, inclusive. Overall, if the above-mentioned activities occur outside of these time periods (i.e., October 1 through March 31), surveys and additional approvals or permits should not be needed for migratory birds, eastern prairie fringed orchid, Indiana bats, or bald eagles.
Special Management Areas	No	Based on the USGS Protected Areas Database of the U.S., no federal, state, or other public lands were identified within the project area or within one mile (1.6 km) of the project area. Based on the National Conservation Easement Database, no conservation easements were identified within the project area or within one mile (1.6 km) of the project area.
Archaeological, Cultural, and Historic Resources	Possible	No historic or archaeological resources were identified within the project area or within one mile (1.6 km) of the project area based on the Illinois Historic Preservation Division Historic and Architectural Resources Geographic Information System database. Please note that if the project requires federal permitting, approval, or uses federal funding additional historic and cultural resources studies

Resource	Issue Present (Yes, Possible, No)	Comments
		may be required to comply with Section 106 of the National Historic Preservation Act.

Introduction and Purpose

1.1 Project Description

Cortland Solar LLC is proposing to construct a solar energy facility within 79.4 acres in DeKalb County, Illinois (Project Area) (**Figure 1**). Specifically, the project area is in Township 40N Range 5E Sections 27 and 28 immediately adjacent south of the eastern portion of the City of Cortland, Illinois (**Figure 2**). The 79.4-acre project area is generally bounded by the following features (**Figure 2**):

- North: Chicago and North Western railroad and cultivated cropland.
- East: Cultivated cropland and Union Ditch Number 1.
- South: Residences, cultivated cropland, Union Ditch Number 1, and State Route 38.
- West: Cultivated cropland.

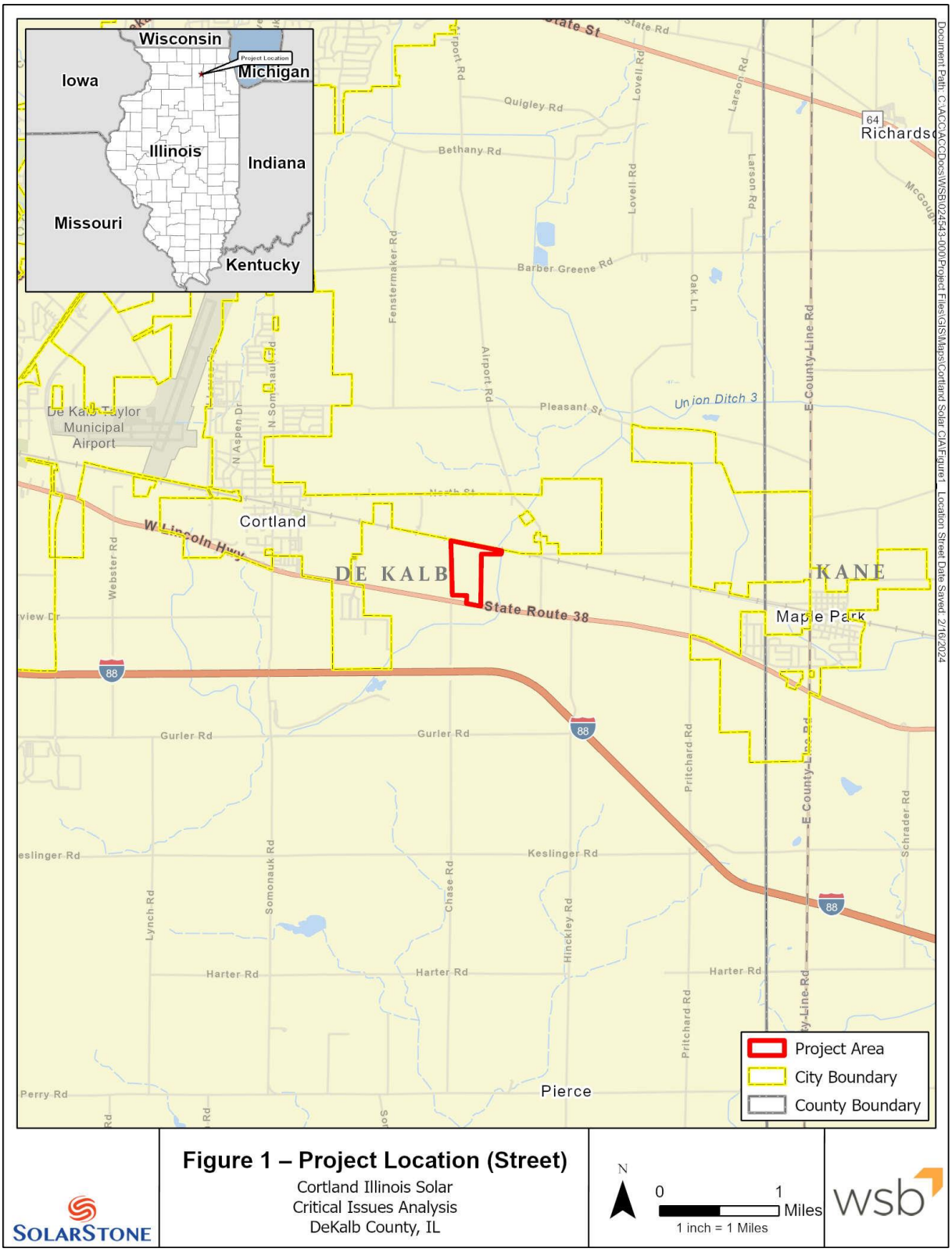


Figure 1 – Project Location (Street)
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

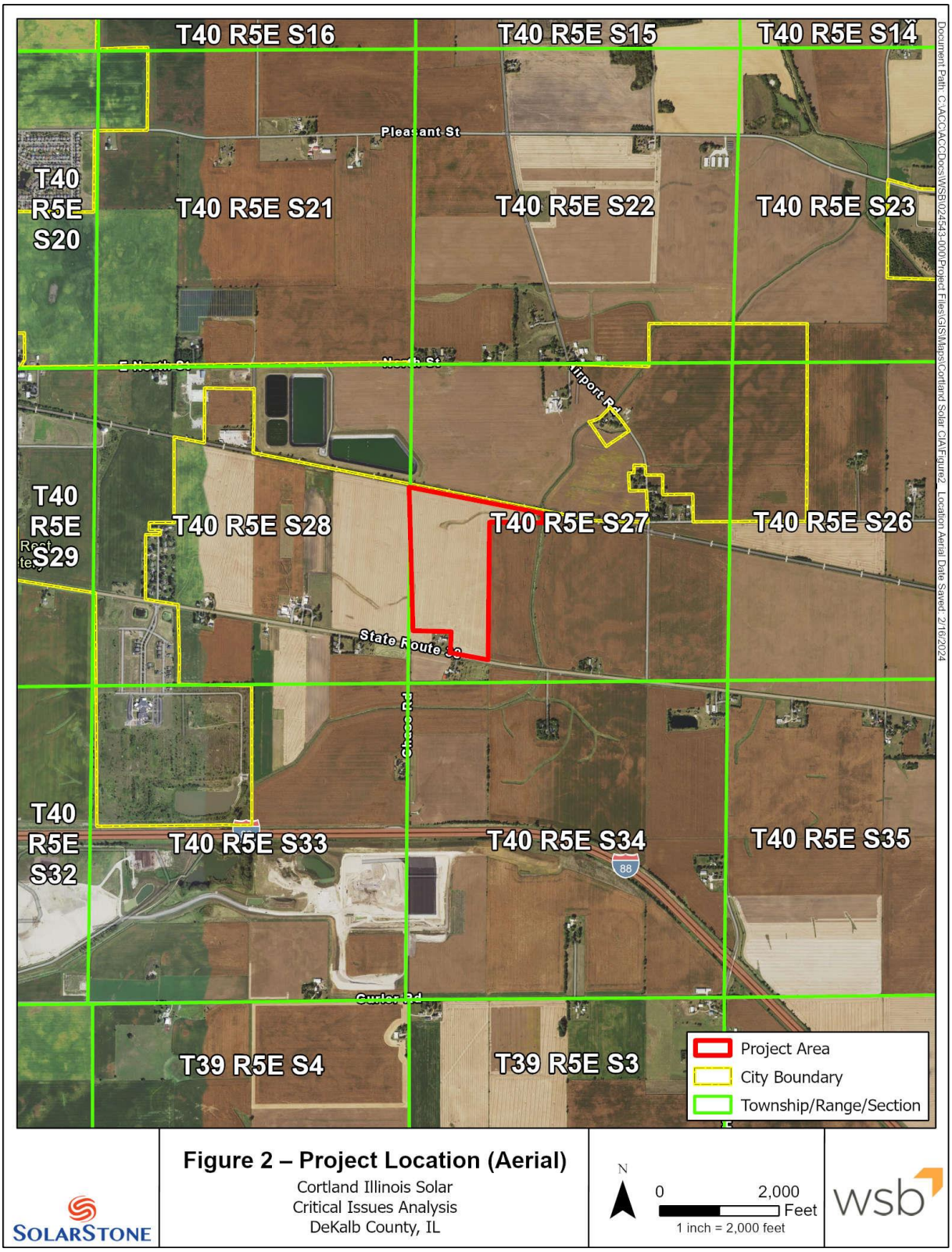


Figure 2 – Project Location (Aerial)

Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

N
0 2,000 Feet
1 inch = 2,000 feet

1.2 Purpose

On behalf of Cortland Solar LLC, WSB completed a desktop-based Critical Issues Analysis for the proposed project. The purpose of this review was to identify if environmental, biological, cultural or historical features occur within or near the project area that may impact the siting or construction of a solar energy facility.

Methods

Publicly available data were reviewed to identify environmental, biological, cultural, or historical features within or near the project area. Publicly available data reviewed included remote sensing data, geographic information system (GIS) data, historic imagery, and information from local, state or federal departments or agencies. The data collection effort included obtaining information from the following resources:

- Illinois Department of Natural Resources (IDNR) Ecological Compliance Assessment Tool (EcoCAT)
- Illinois Historic Preservation Division (IHPD) Historic and Architectural Resources Geographic Information System (HARGIS)
- Illinois State Geological Survey (ISGS) Coal Mines in Illinois
- ISGS Illinois Sinkhole Areas
- National Conservation Easement Database (NCED)
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS)
- U.S. Department of Transportation (USDoT) National Pipeline Mapping System (NPMS)
- U.S. Electric Power Transmission Lines
- U.S. Energy Information Administration Energy Mapping System
- U.S. Federal Aviation Administration (FAA) Notice Criteria Tool
- U.S. Federal Emergency Management Agency (FEMA) flood map
- U.S. Fish and Wildlife Service (USFWS) Critical Habitat for Threatened and Endangered Species
- USFWS Information for Planning and Consultation (IPaC)
- USFWS National Wetland Inventory (NWI)
- U.S. Geological Survey (USGS) National Hydrography Dataset (NHD)
- USGS National Land Cover Database (NLCD)
- USGS Protected Areas Database of the U.S. (PADUS)
- USGS Topographic Maps
- USGS USA Karsts

The results of the desktop review are provided below are provided below.

Results

1.3 Topography

Topography within the project area ranges from 852 feet (ft) (259 meters [m]) above mean sea level (amsl) in the northeastern corner of the project area to 868 ft (264 m) amsl from the southeastern portion of the project area (**Figure 3**). Topographic relief appears to be moderate.

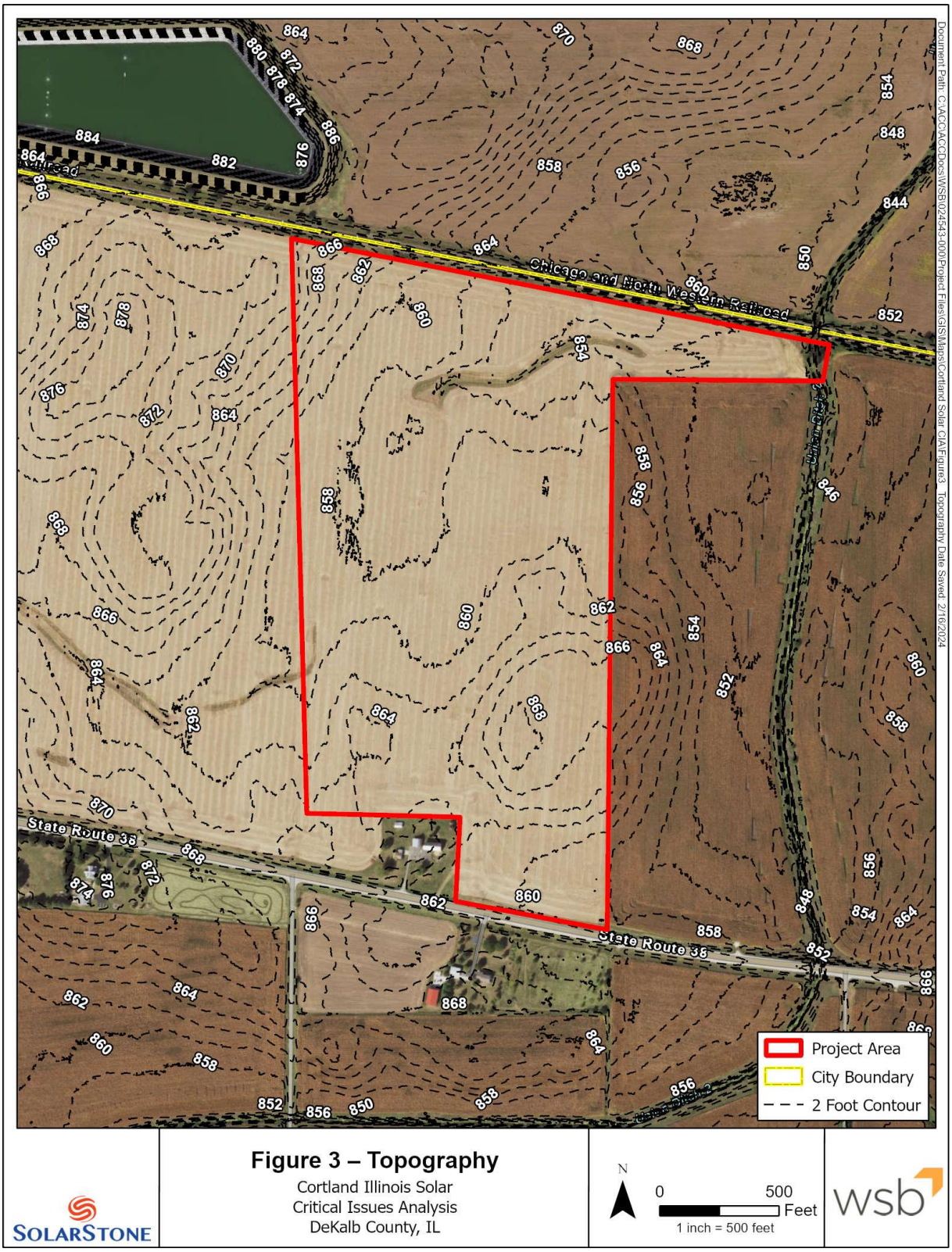


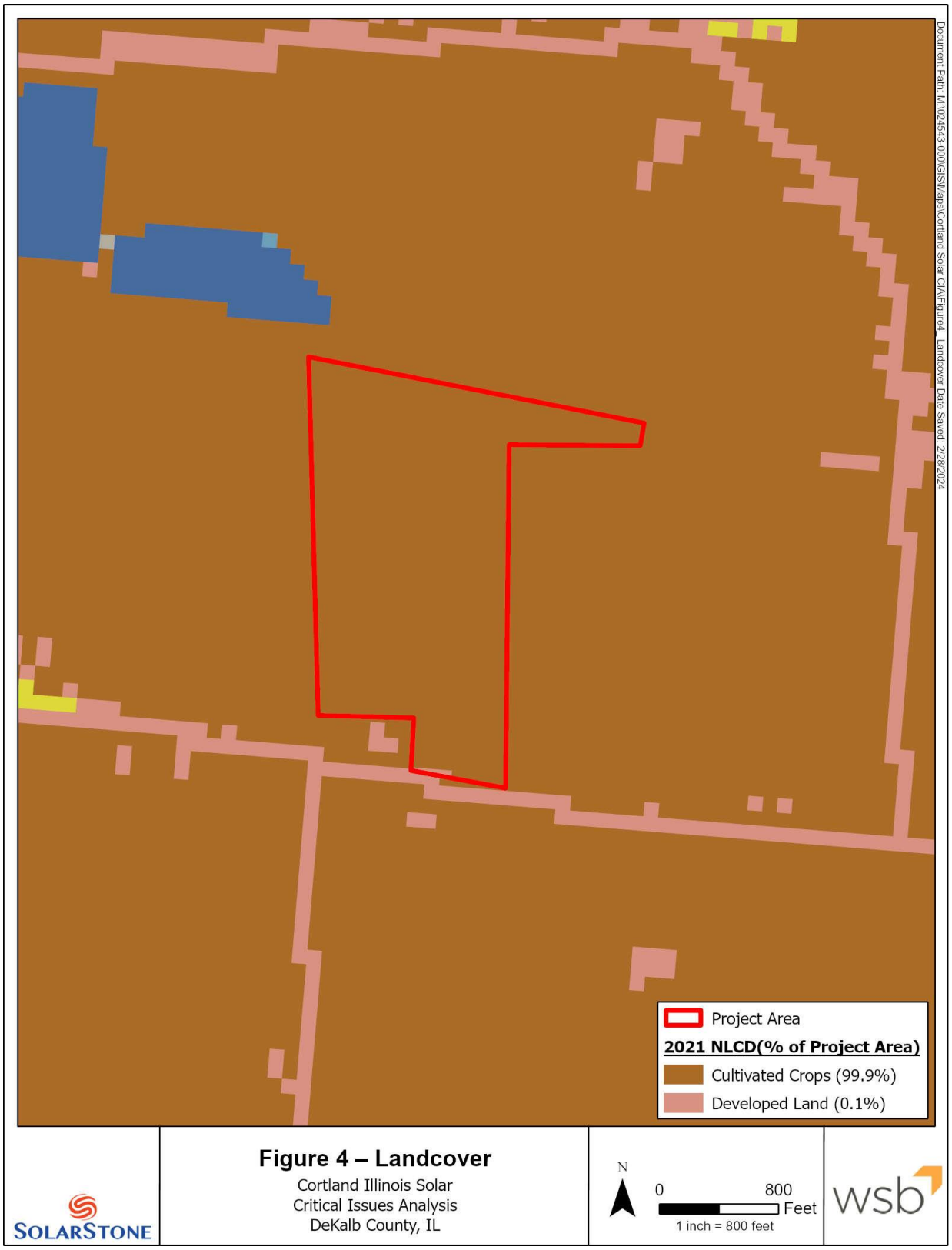
Figure 3 – Topography
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

1.4 Land Use

Two land cover types were identified within the project area based on the USGS NLCD. The project area is predominantly comprised of cultivated cropland (99.9 percent) followed by a minor component of developed land (0.1 percent) (**Table 2**) (**Figure 4**).

Table 2 – Land cover types and their respective coverages within the project area.

Land Cover	Acres	Percent of Project Area
Cultivated Cropland	79.3	99.9
Developed Land	0.1	0.1
TOTAL	**79.4**	**100.0**
Note: Individual acreages or percentages may not sum to total due to rounding.		


Document Path: M:\024543-000\GIS\Maps\Cortland Solar CIA\Figure4_Landcover Date Saved: 2/28/2024
Project Area
2021 NLCD(% of Project Area)
Cultivated Crops (99.9%)
Developed Land (0.1%)
SOLARSTONE
Figure 4 – Landcover
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL
N
0
800
Feet
1 inch = 800 feet
wsb

1.5 Zoning and Special Considerations

Zoning

The project area is proposed to be annexed into the Town of Cortland in the AG, agricultural district.

The proposed solar energy facility is permitted in the AG district of the Town of Cortland with a Special Use Permit and subsequent building permit. The town ordinance requires that equipment be set back a minimum of 50 ft (15.2 m) from all nonparticipating property lines. The height of solar panels, cells, or modules while at full tilt may not exceed 10 ft (3.1 m).

The site must be enclosed and secured with a fence with a minimum height of 6 ft (1.8 m). Keys shall be provided at locked entrances for access by appropriate emergency personnel. Appropriate warning signs must be provided on fences and transformers in accordance with Occupational Safety and Health Association (OSHA) regulations, National Electrical Safety Code, and American National Standards Institute Z535 Safety Sign Standards. Signs at entrances shall include the facility's 911 address and a 24-hour emergency contact number.

Special Use Permit

The following materials must be submitted with the Special Use Permit application:

- Site plan;
- Interconnection status information;
- Ground cover information;
- IDNR EcoCAT results; and a
- Decommissioning plan.

The proposed solar energy facility must comply with any applicable state and federal requirements including the National Electric Code, OSHA regulations, and FAA requirements.

Building Permit

A building permit is required prior to construction and after Special Use Permit approval. Application materials must include:

- A decommissioning plan financial surety; and
- Proof of liability insurance commencing with issuance of building permit.

Special Considerations

There are no airports within the project area. There is one Airport (Ruder) within one mile (1.6 km) of the project area. The FAA Notice Criteria Tool indicates that no further coordination with the FAA is required as the project area does not exceed Notice Criteria (**Appendix A**).

Based on the U.S. Energy Information Administration mapping system and the U.S. Electric Power Transmission Lines, there were no electric transmission lines (i.e., 69 kilovolts [kV] or more) within the project area or within one mile (1.6 km) of the project area.

Based on the USGS USA Karsts, there are no karst features within the project area. There is a carbonate limestone karst feature within one mile (1.6 km) of the project area (**Figure 5**) Based on the ISGS, there are no mines and sinkholes within the project area or within one mile (1.6 km) of the project area.

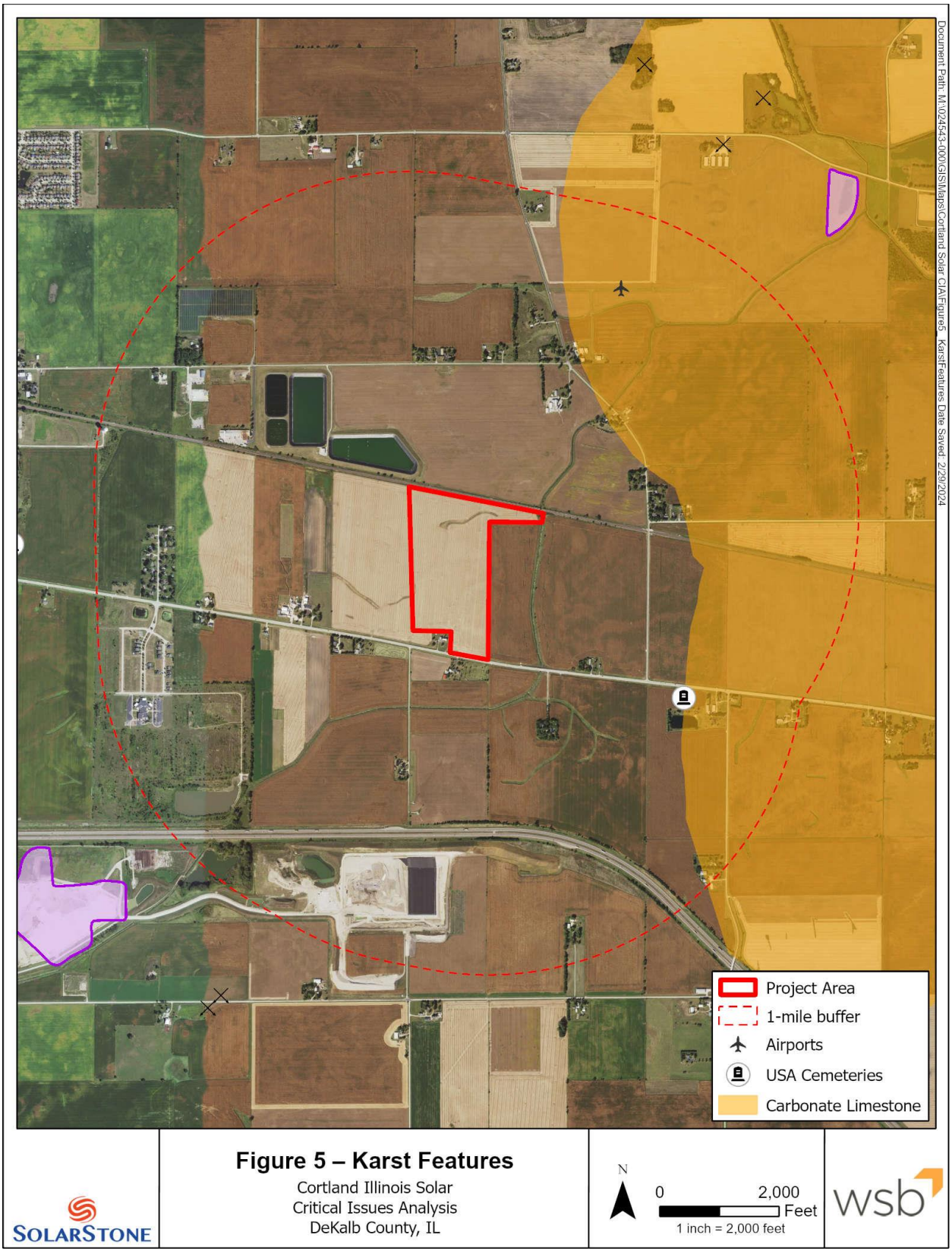


Figure 5 – Karst Features

Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

1.6 Soils

Based on the USDA NRCS WSS, most soils within the project area were comprised of silt loam (73.3 percent of the project area) (**Table 3**) (**Figure 6**). Approximately 26.7 percent of the project area was comprised of hydric soils (**Table 3**) (**Figure 6**).

Table 3 – Soil types and their respective coverages within the project area.

Map Unit Symbol and Map Unit Name	Hydric Rating	Acres	Percent of Project Area
152A: Drummer silty clay loam, 0 to 2 percent slopes	100	21.2	26.7
667A: Kaneville silt loam, 0 to 2 percent slopes	8	20.9	26.3
104A: Virgil silt loam, 0 to 2 percent slopes	10	14.1	17.8
667B: Kaneville silt loam, 2 to 5 percent slopes	0	10.7	13.5
325C2: Dresden silt loam, 4 to 6 percent slopes, eroded	4	6.4	8.1
154A: Flanagan silt loam, 0 to 2 percent slopes	4	3.1	3.9
512B: Danabrook silt loam, 2 to 5 percent slopes	8	2.1	2.6
171B: Catlin silt loam, 2 to 5 percent slopes	0	0.9	1.1
Total	**--**	**79.4**	**100.0**

Map unit symbol	Map unit name	Percent Hydric	Hydric Rating
104A	Virgil silt loam, 0 to 2 percent slopes	10	Predominantly non-hydric
152A	Drummer silty clay loam, 0 to 2 percent slopes	100	All hydric
154A	Flanagan silt loam, 0 to 2 percent slopes	4	Predominantly non-hydric
171B	Catlin silt loam, 2 to 5 percent slopes	0	Not hydric
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	4	Predominantly non-hydric
512B	Danabrook silt loam, 2 to 5 percent slopes	8	Predominantly non-hydric
667A	Kaneville silt loam, 0 to 2 percent slopes	8	Predominantly non-hydric
667B	Kaneville silt loam, 2 to 5 percent slopes	0	Not hydric

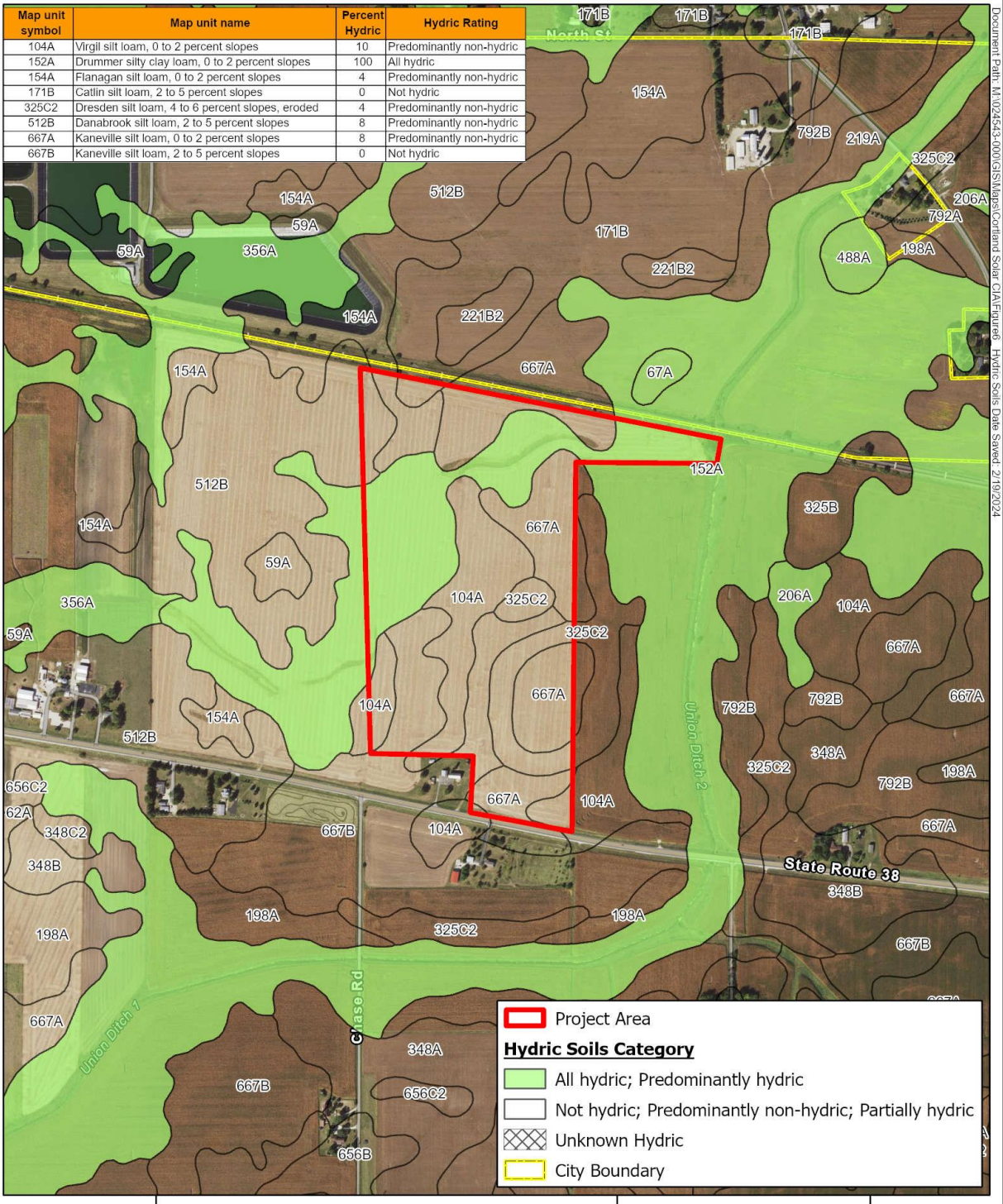


Figure 6 – Soils – Hydric Rating

Cortland Illinois Solar
Critical Issues Analysis
DelKab County, IL

SOLARSTONE

wsb

Most of the project area was classified as prime farmland (55.5 percent) followed by prime farmland if drained (44.5 percent) (**Table 4**) (**Figure 7**).

Table 4 – Farmland classifications and their respective coverages within the project area.

Map Unit Symbol and Map Unit Name	Acres	Percent of Project Area
Prime farmland if drained	44.1	55.5
Prime farmland	35.3	44.5
Total	**79.4**	**100.0**

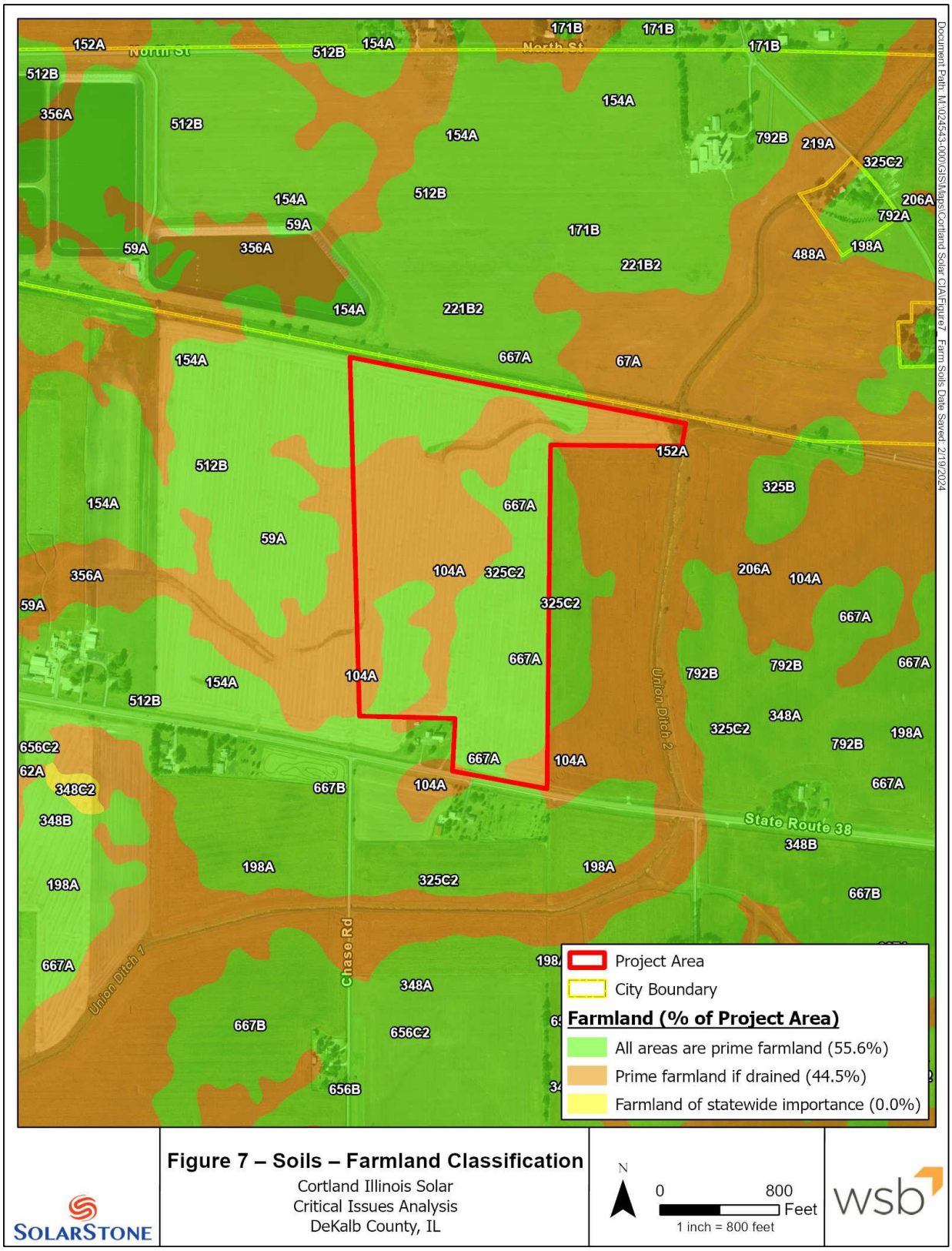
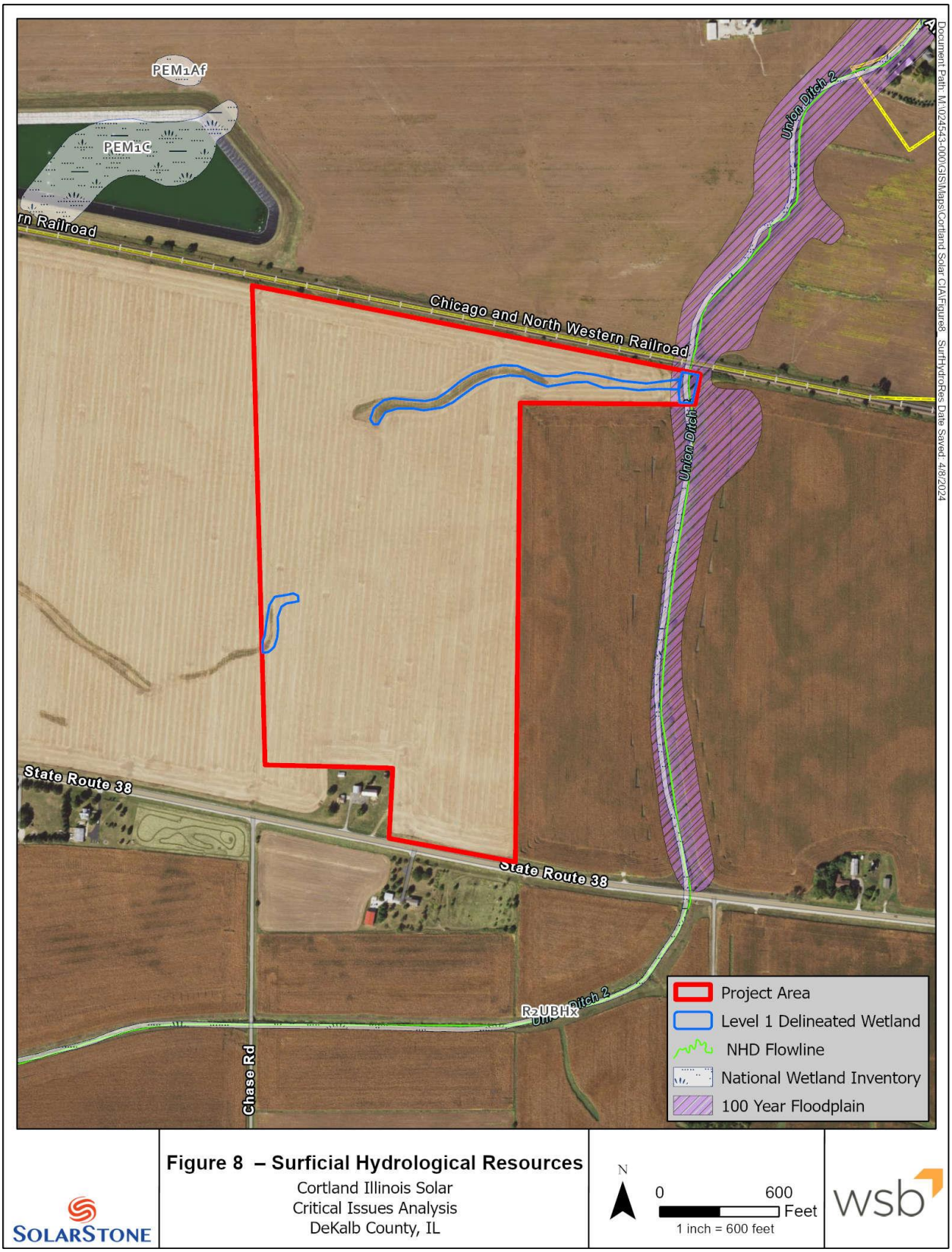


Figure 7 – Soils – Farmland Classification
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

1.7 Surficial Hydrological Resources

Based on the USFWS NWI, a riverine wetland (R2UBHx) is mapped within the project area (**Figure 8**). A USGS NHD flowline (Union Ditch Number 1) is mapped within the project area and corresponds with the riverine wetland within the project area. There was a 100-Year (Zone A) FEMA flood zone that is associated with the USGS flowline within the project area (**Figure 8**).

A Level 1 wetland delineation (desktop review) identified three possible wetlands within the project area (**Figure 8**).



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Figure 8 – Surficial Hydrological Resources
Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

N
0 600 Feet
1 inch = 600 feet

wsb

1.8 National Pipeline Mapping System

Based on the USDOT NPMS Public Map Viewer, there was a natural gas pipeline mapped within the project area. The natural gas pipeline (Pipeline ID M500-1) is owned by Guardian Pipeline, LLC (**Appendix B**). No other natural gas pipelines were mapped within one mile (1.6 km) of the project area. There were no hazardous liquid pipelines, liquefied natural gas plants, or breakout tanks within the project area or within one mile (1.6 km) of the project area.

1.9 Biological Resources

Illinois Department of Natural Resources Ecological Compliance Assessment Tool

The IDNR EcoCAT (Project # 2410685; February 16, 2024) indicated there were no records of state listed species, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves identified in the vicinity of the project location (**Appendix C**). As such, consultation was terminated. The termination is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been constructed within two years of the date of the termination letter, or any of the above-listed conditions develop, a new consultation is necessary.

Federally Protected Species

Based on the USFWS IPaC, three federally threatened or endangered species, a proposed endangered species, a non-essential experimental population, and a candidate species for federal listing may occur within the project area or surrounding region (**Appendix D**). The six species identified include the federally endangered Indiana bat (*Myotis sodalis*), federally endangered northern long-eared bat (*Myotis septentrionalis*), federally threatened eastern prairie fringed orchid (*Platanthera leucophaea*), proposed endangered tricolored bat (*Perimyotis subflavus*), non-essential experimental population of whooping crane, and monarch butterfly (*Danaus plexippus*), a candidate for federal listing. The Indiana bat and eastern prairie fringed orchid are state endangered. The federally endangered rusty patched bumble bee (*Bombus affinis*) is included here due to the proximity of the project area to the USFWS rusty patched bumble bee Low Potential Zone. Also, the bald eagle (*Haliaeetus leucocephalus*) is included here due to being protected under the Bald and Golden Eagle Protection Act (BGEPA) and the species' range encompasses the project area.

Indiana bat (*Myotis sodalis*)

The Indiana bat is federally and state endangered. The Indiana bat range extends throughout Illinois. Primary threats to Indiana bat populations include adverse effects from the fungus (*Pseudogymnoascus destructans*) that manifests as white-nose syndrome, human disturbance during hibernation, and loss of summer roosting habitat.

Indiana bats hibernate in caves and mines during the winter. Suitable Indiana bat roosting and foraging habitat includes a variety of forested/wooded areas including fencerows and riparian corridors, where they roost and forage, and may include adjacent and interspersed non-forested habitats such as emergent wetlands and edges of agricultural fields, old fields, or pastures. Suitable forested/wooded areas contain multiple potential roost sites (i.e., living or dead trees) in dense or loose aggregates of trees with variable amounts of canopy closure.

The nearest USFWS designated Indiana bat critical habitat is located approximately 18 miles (29 kilometers) south of the project area. As potentially suitable Indiana bat summer roosting habitat appears to be limited or absent, and foraging habitat appears to be available within the project area, the likelihood of occurrence is considered low to moderate.

Northern long-eared bat (*Myotis septentrionalis*)

The northern long-eared bat is federally endangered. The northern long-eared bat range extends throughout Illinois. Primary threats to the northern long-eared bat populations include adverse effects from the fungus (*Pseudogymnoascus destructans*) that manifests as white-nose syndrome, human disturbance during hibernation, and loss of summer roosting habitat.

Northern long-eared bats hibernate in caves and mines during the winter. Suitable roosting and foraging habitat includes a variety of forested/wooded areas including fencerows and riparian corridors, and may include adjacent and interspersed non-forested habitats such as emergent wetlands and edges of agricultural fields, old fields, or pastures. Suitable forested/wooded areas may contain multiple potential roost sites (i.e., living or dead trees) in dense or loose aggregates of trees with variable amounts of canopy closure.

No critical habitat is identified for the northern long-eared bat. Potentially suitable northern long-eared bat summer roosting habitat appears to be limited or absent within the project area, though foraging habitat appears to be available. The likelihood of occurrence is considered low to moderate. Additionally, USFWS notes that this bat species only needs to be considered if the project involves wind turbines.

Tricolored bat (*Perimyotis subflavus*)

Tricolored bats are proposed endangered at the federal level. Tricolored bats occur throughout Illinois. Primary threats to tricolored bats include habitat loss and adverse effects from the fungus that manifests as white-nose syndrome.

Tricolored bats hibernate in caves and mines. In the summer, tricolored bats often roost in trees, but some males and non-reproductive females also roost in their winter hibernaculum. Maternity colonies may be established in trees, rock crevices, or barns and other buildings.

As potentially suitable tricolored bat summer roosting habitat appear to be limited or absent, and foraging habitat appears to be available within the project area, the likelihood of occurrence is considered low to moderate.

Monarch butterfly (*Danaus plexippus*)

As a candidate species for listing, monarchs are not afforded any legal protective status. Monarch butterflies occur throughout Illinois during the summer and migratory periods. Primary threats to monarchs include habitat loss and the use of herbicides on their host plant, milkweeds (*Asclepias* spp.).

Monarch butterflies use fields and parks where native milkweed, and other flowering plant species are common. Monarch larvae are milkweed obligates, however adults feed on a variety of flowering plants.

Potentially suitable monarch habitat appears to be limited or absent within the project area. As such, the probability of monarch occurrence within the project area is considered low to moderate.

Rusty patched bumble bee (*Bombus affinis*)

The rusty patched bumble bee is federally and state endangered. The rusty patched bumble bee is distributed throughout northern Illinois and locally throughout central Illinois. Primary threats to rusty patched bumble bees include habitat loss, disease, and pesticides.

Rusty patched bumble bees occur in a variety of habitats including prairies, woodlands, marshes, agricultural landscapes, and residential parks and gardens. Rusty patched bumble bees require areas that support sufficient food (nectar and pollen from diverse and abundant flowers), undisturbed nesting

sites in proximity to floral resources and overwintering sites for hibernating queens. Nesting sites include underground and abandoned rodent cavities or clumps of grass (i.e., bunchgrasses) and overwintering sites include patches of undisturbed soil along woodland edges.

The USFWS adapted a habitat connectivity model to identify the zones around current records (2007-2022) where there is a high potential for rusty patched bumble bees to occur. The zones are referred to as High Potential Zones or Low Potential Zones. Low Potential Zones are areas unlikely to have rusty patched bumble bees present.

There is rusty patched bumble bee Low Potential Zone within one mile (1.6 km) of the project area (**Figure 9**). Although potentially suitable rusty patched bumble bee habitat is available but limited within the project area, the project area is not within a Potential Zone, indicating that the potential for occurrence is low.

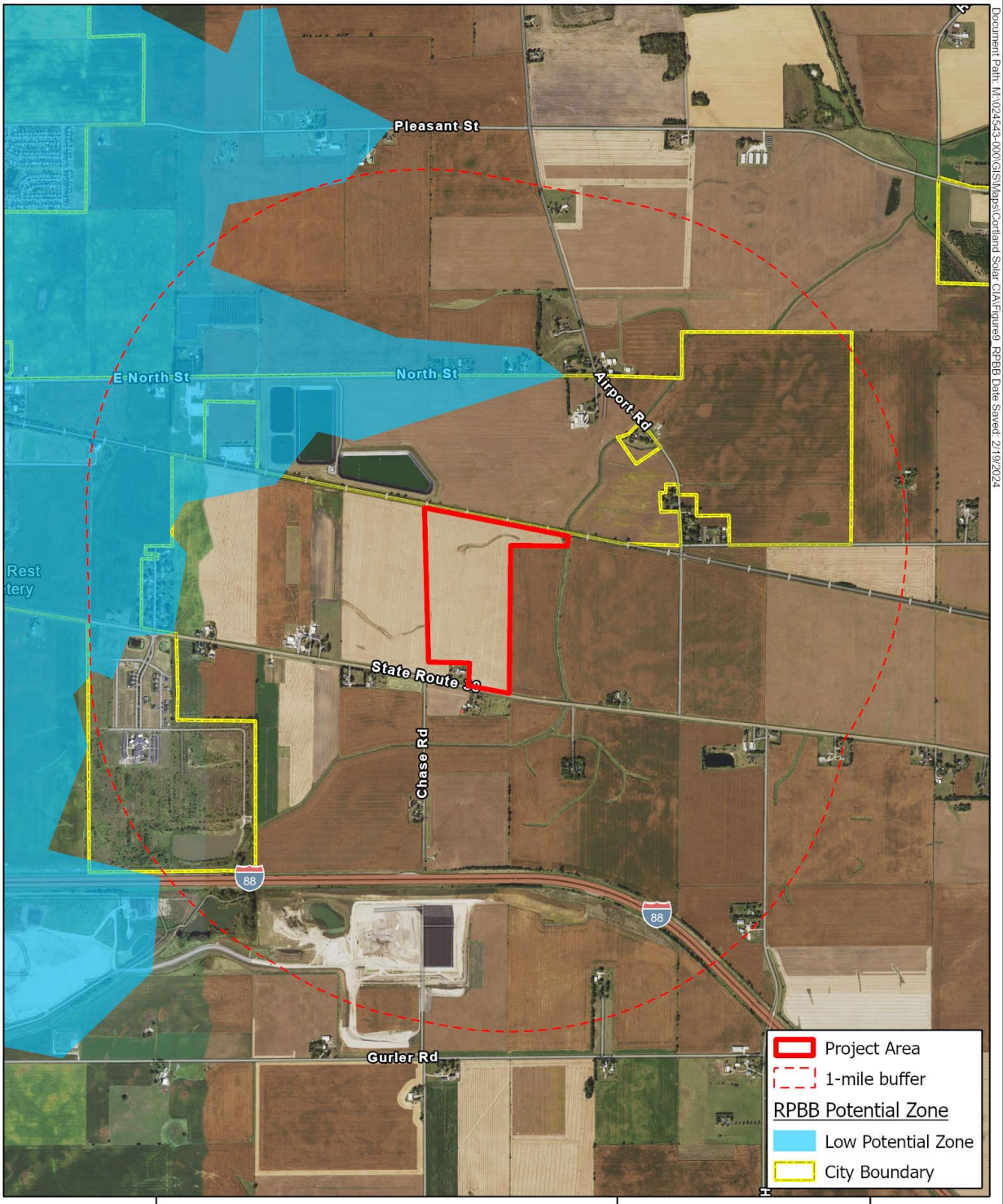


Figure 9 – Rusty Patched Bumble Bee Potential Zones

Cortland Illinois Solar
Critical Issues Analysis
DeKalb County, IL

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Whooping crane (*Grus americana*)

The eastern population of whooping crane is considered experimental and non-essential. Non-essential, experimental populations are not considered essential to the continued existence of a species. Take prohibitions and USFWS consultation requirements are relaxed for non-essential, experimental populations. The eastern population of whooping cranes typically occur in northern Illinois during the summer and in southern Illinois during the winter. Primary threats to whooping crane populations include habitat loss and degradation.

During migration, whooping cranes use wetlands with emergent vegetation and shallow water (i.e., < 18 inches [46 cm] deep), including shallow marshes and wet meadows. Whooping cranes also use flooded agricultural fields and shallow river bottoms. Whooping cranes avoid areas with tall structures (e.g., trees, buildings, et cetera).

As there is potentially suitable whooping crane foraging or stop-over habitat within the project area but limited due to the proximity to State Route 38 and the Chicago and North Western railroad, the likelihood of whooping crane occurrence is low to moderate.

Bald eagle (*Haliaeetus leucocephalus*)

Bald eagles are protected under the BGEPA. The Illinois bald eagle population occurs year-round. Primary threats to bald eagle populations in Illinois include climate change and lead poisoning.

Bald eagles typically nest in mature trees near water sources that support an adequate food supply. Once built, a nest may be reused and added to in subsequent years and alternate nest sites are common. Wintering grounds typically contain open water, food resources, and protective roosting sites. Preferred roost sites are in stands of mature trees with well-developed canopies.

As potentially suitable bald eagle roosting and nesting habitat appears to be limited or absent within the project area, the likelihood of occurrence is considered low to moderate.

Eastern prairie fringed orchid (*Platanthera leucophaea*)

Eastern prairie fringed orchid are federally threatened and state endangered. Eastern prairie fringed orchids occur in the northern half of Illinois. Threats to eastern prairie fringed orchid populations include the loss and conversion of suitable habitat for agricultural purposes, successional progression, and competition with invasive species.

Eastern prairie fringed orchids occur in mesic prairies, sedge meadows, marsh edges, and bogs. Eastern prairie fringed orchids typically occur in grassy areas devoid of woody encroachment.

As potentially suitable eastern prairie fringed orchid habitat within the project area appears to be available but limited, the potential for occurrence is considered low to moderate.

1.10 Special Management Areas

Based on the USGS PADUS, no federal, state, or other public lands occur within the project area or within one mile (1.6km) of the project area. Also, based on the NCED, no conservation easements were identified within the project area or within one mile (1.6 km) of the project area.

1.11 Archaeological, Cultural, and Historical Resources

No historic or archaeological resources were identified within the project area or within one mile (1.6 km) of the project area based on the IHPD HARGIS database.

References

Federal Aviation Administration. Notice Criteria Tool. Available at: Notice Criteria Tool (faa.gov)

Federal Emergency Management Agency. Map Service Center. Available at: https://msc.fema.gov/portal/home.

Illinois Historic Preservation Division. HARGIS. Available at: https://idnr.maps.arcgis.com/apps/webappviewer/index.html?id=fb288126309544878addd6496243fa91.

National Conservation Easement Database. Mapping Application. Available at: NCED Mapping Application (conservationeasement.us).

National Pipeline Mapping System. Public Viewer. Available at: https://pvnpms.phmsa.dot.gov/PublicViewer/.

U.S. Department of Agriculture Natural Resources Conservation Service. Web Soil Survey. Available at: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

U.S. Energy Information Administration. Electricity Map Viewer. Available at: https://atlas.eia.gov/apps/electricity/explore.

U.S. Fish and Wildlife Service. Critical habitat for threatened and endangered species. Available at: Critical Habitat for Threatened & Endangered Species [USFWS] - (arcgis.com)

_____. Information for Planning and Consultation. Available at: https://ecos.fws.gov/ipac/.

_____. National Wetlands Inventory. Available at: National Wetlands Inventory (usgs.gov)

U.S. Geological Survey. National Hydrography Dataset. Available at: NHDPlus Upper Mississippi Data (Vector Processing Unit 07) | US EPA

_____. Gap Analysis Project (GAP), 2020, Protected Areas Database of the United States (PAD-US) 2.1: U.S. Geological Survey data release. Available at: https://viewer.nationalmap.gov/advanced-viewer/.

_____. USA Karst. Available at: ArcGIS - USA Karst

Appendix A

Federal Aviation Administration Notice Criteria Tool Results

Federal Aviation Administration

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2018.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

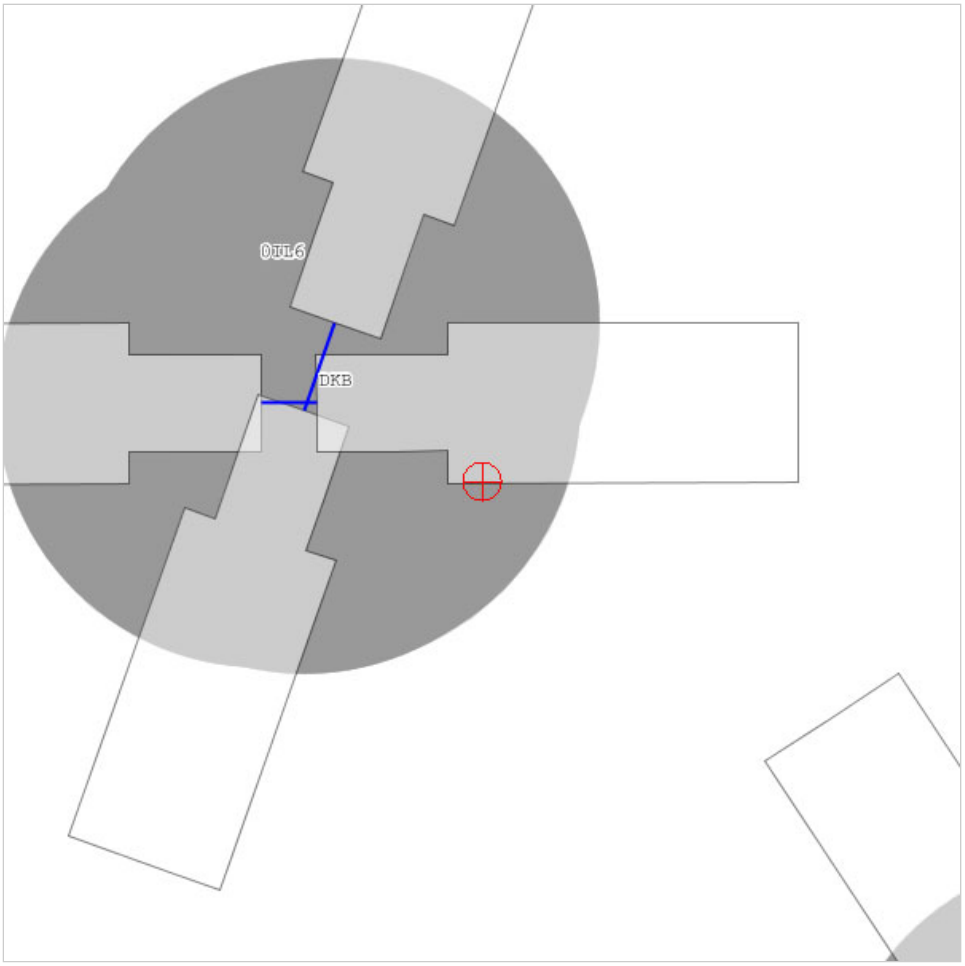
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

* **Structure Type:**	SOLAR | Solar Panel Please select structure type and complete location point information.
Latitude:	41 Deg 54 M 45 S N
Longitude:	88 Deg 39 M 26 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	869 (nearest foot)
Structure Height :	40 (nearest foot)
Is structure on airport:	(●) No ( ) Yes

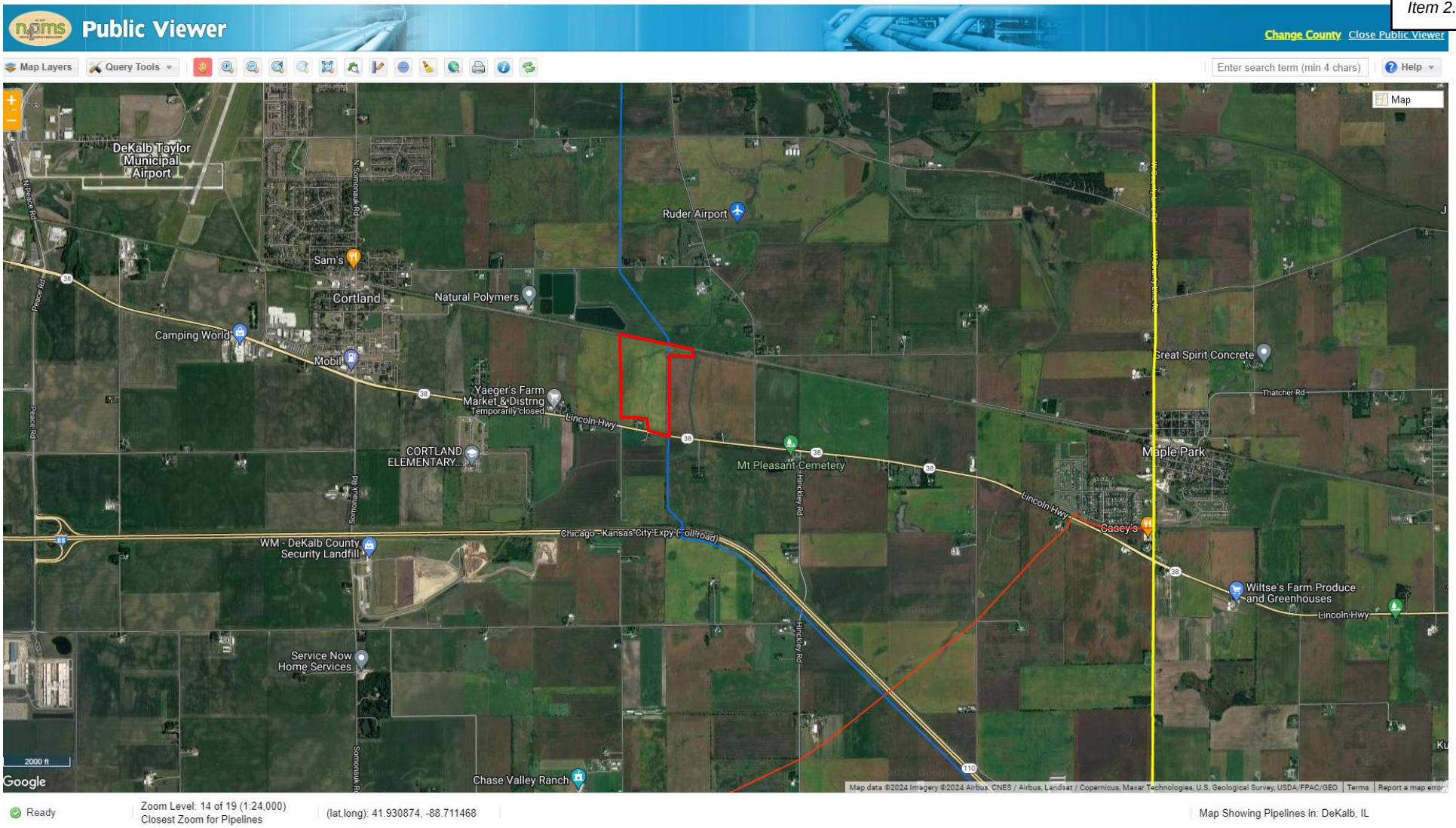
Results

You do not exceed Notice Criteria.

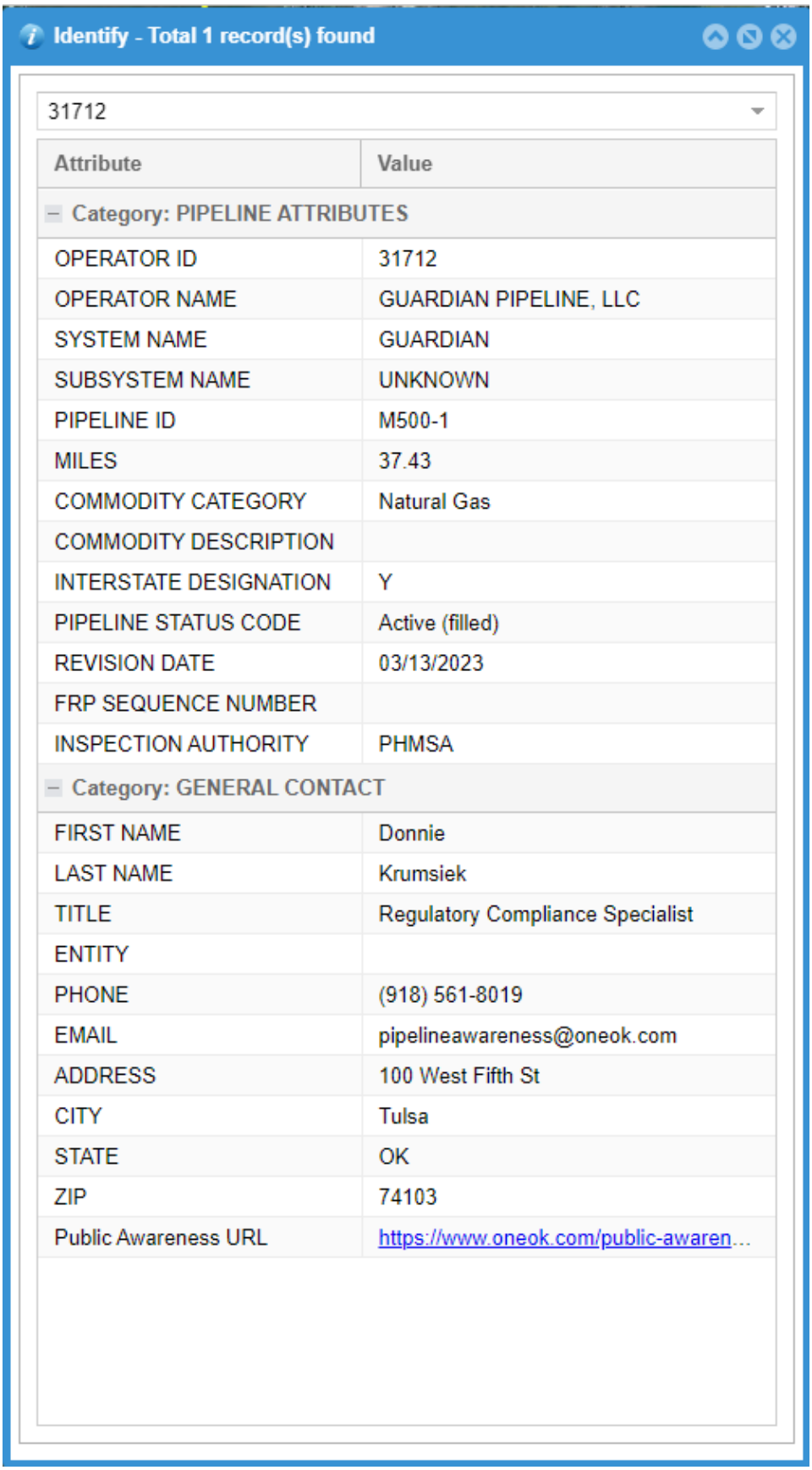

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DKB

Appendix B

National Pipeline Mapping System Results



Ready | Zoom Level: 14 of 19 (1:24,000) Closest Zoom for Pipelines | (lat,long): 41.930874, -88.711468 | Map Showing Pipelines in: DeKalb, IL



Attribute	Value
Category: PIPELINE ATTRIBUTES	
OPERATOR ID	31712
OPERATOR NAME	GUARDIAN PIPELINE, LLC
SYSTEM NAME	GUARDIAN
SUBSYSTEM NAME	UNKNOWN
PIPELINE ID	M500-1
MILES	37.43
COMMODITY CATEGORY	Natural Gas
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	Y
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	03/13/2023
FRP SEQUENCE NUMBER	
INSPECTION AUTHORITY	PHMSA
Category: GENERAL CONTACT	
FIRST NAME	Donnie
LAST NAME	Krumsiek
TITLE	Regulatory Compliance Specialist
ENTITY	
PHONE	(918) 561-8019
EMAIL	pipelineawareness@oneok.com
ADDRESS	100 West Fifth St
CITY	Tulsa
STATE	OK
ZIP	74103
Public Awareness URL	https://www.oneok.com/public-awaren...

Appendix C

Illinois Department of Natural Resources Ecological Compliance Assessment Tool Results

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Applicant: Cortland Solar, LLC
Contact: Lucas Wandrie
Address: 3822 Zenith Ave S
Minneapolis, MN 55410

Project: Cortland Illinois Solar
Address: 15110 Lincoln Hwy, DeKalb

Description: Solar energy facility

IDNR Project Number: 2410685
Date: 02/16/2024

Natural Resource Review Results

Consultation for Endangered Species Protection and Natural Areas Preservation (Part 1075)

The Illinois Natural Heritage Database contains no record of State-listed threatened or endangered species, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves in the vicinity of the project location.

Consultation is terminated. This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary. Termination does not imply IDNR's authorization or endorsement.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: DeKalb

Township, Range, Section:
40N, 5E, 27



IL Department of Natural Resources Contact
Bradley Hayes
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction
Planning and Zoning
Derek M. Hiland
Administration Building
110 E Sycamore St
Sycamore, Illinois 60178

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

Terms of Use

By using this website, you acknowledge that you have read and agree to these terms. These terms may be revised by IDNR as necessary. If you continue to use the EcoCAT application after we post changes to these terms, it will mean that you accept such changes. If at any time you do not accept the Terms of Use, you may not continue to use the website.

1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.

3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

Security

EcoCAT operates on a state of Illinois computer system. We may use software to monitor traffic and to identify unauthorized attempts to upload, download, or change information, to cause harm or otherwise to damage this site. Unauthorized attempts to upload, download, or change information on this server is strictly prohibited by law.

Unauthorized use, tampering with or modification of this system, including supporting hardware or software, may subject the violator to criminal and civil penalties. In the event of unauthorized intrusion, all relevant information regarding possible violation of law may be provided to law enforcement officials.

Privacy

EcoCAT generates a public record subject to disclosure under the Freedom of Information Act. Otherwise, IDNR uses the information submitted to EcoCAT solely for internal tracking purposes.

Appendix D

U.S. Fish and Wildlife Service Information for Planning and Consultation Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
Phone: (309) 757-5800 Fax: (309) 757-5807

In Reply Refer To: 06/17/2024 16:16:07 UTC
Project Code: 2024-0047976
Project Name: Solar CIA - Cortland

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The attached species list identifies federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat, if present, within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) **the accuracy of this species list should be verified after 90 days**. This verification can be completed formally or informally. You may verify the list by visiting the ECOSPHERE Information for Planning and Consultation (IPaC) website https://ipac.ecosphere.fws.gov at regular intervals during project planning and implementation and completing the same process you used to receive the attached list.

Section 7 Consultation

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the U.S. Fish and Wildlife Service (Service) if they determine their project “may affect” listed species or designated critical habitat. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action may affect endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service to make "no effect" determinations. If you determine that your proposed action will have no effect on threatened or endangered species or their respective designated critical habitat, you do not need to seek concurrence with the Service.

Note: For some species or projects, IPaC will present you with *Determination Keys*. You may be able to use one or

more Determination Keys to conclude consultation on your action.

Technical Assistance for Listed Species

1. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain information on the species life history, species status, current range, and other documents by selecting the species from the thumbnails or list view and visiting the species profile page.

No Effect Determinations for Listed Species

1. If there are *no* species or designated critical habitats on the Endangered Species portion of the species list: conclude "no species and no critical habitat present" and document your finding in your project records. No consultation under ESA section 7(a)(2) is required if the action would result in no effects to listed species or critical habitat. Maintain a copy of this letter and IPaC official species list for your records.
2. If any species or designated critical habitat are listed as potentially present in the **action area** of the proposed project the project proponents are responsible for determining if the proposed action will have “no effect” on any federally listed species or critical habitat. No effect, with respect to species, means that no individuals of a species will be exposed to any consequence of a federal action or that they will not respond to such exposure.
3. If the species habitat is not present within the action area or current data (surveys) for the species in the action area are negative: conclude “no species habitat or species present” and document your finding in your project records. For example, if the project area is located entirely within a “developed area” (an area that is already graveled/paved or supports structures and the only vegetation is limited to frequently mowed grass or conventional landscaping, is located within an existing maintained facility yard, or is in cultivated cropland conclude no species habitat present. Be careful when assessing actions that affect: 1) rights-of-ways that contains natural or semi-natural vegetation despite periodic mowing or other management; structures that have been known to support listed species (example: bridges), and 2) surface water or groundwater. Several species inhabit rights-of-ways, and you should carefully consider effects to surface water or groundwater, which often extend outside of a project’s immediate footprint.
4. Adequacy of Information & Surveys - Agencies may base their determinations on the best evidence that is available or can be developed during consultation. Agencies must give the benefit of any doubt to the species when there are any inadequacies in the information. Inadequacies may include uncertainty in any step of the analysis. To provide adequate information on which to base a determination, it may be appropriate to conduct surveys to determine whether listed species or their habitats are present in the action area. Please contact our office for more information or see the survey guidelines that the Service has made available in IPaC.

May Effect Determinations for Listed Species

1. If the species habitat is present within the action area and survey data is unavailable or inconclusive: assume the species is present or plan and implement surveys and interpret results in coordination with our office. If assuming species present or surveys for the species are positive continue with the may affect determination process. May affect, with respect to a species, is the appropriate conclusion when a species might be exposed to a consequence of a federal action and could respond to that exposure. For critical habitat, ‘may affect’ is the appropriate conclusion if the action area overlaps with mapped areas of critical habitat and an essential physical or biological feature may be exposed to a consequence of a federal action and could change in response to that exposure.
2. Identify stressors or effects to the species and to the essential physical and biological features of critical habitat that overlaps with the action area. Consider all consequences of the action and assess the potential for each life stage of the species that occurs in the action area to be exposed to the stressors. Deconstruct the action into its component parts to be sure that you do not miss any part of the action that could cause effects to the species or physical and biological features of critical habitat. Stressors that affect species’ resources may have consequences even if the species is not present when the project is implemented.
3. If no listed or proposed species will be exposed to stressors caused by the action, a ‘no effect’ determination may be appropriate – be sure to separately assess effects to critical habitat, if any overlaps with the action

area. If you determined that the proposed action or other activities that are caused by the proposed action may affect a species or critical habitat, the next step is to describe the manner in which they will respond or be altered. Specifically, to assess whether the species/critical habitat is "not likely to be adversely affected" or "likely to be adversely affected."

4. Determine how the habitat or the resource will respond to the proposed action (for example, changes in habitat quality, quantity, availability, or distribution), and assess how the species is expected to respond to the effects to its habitat or other resources. Critical habitat analyses focus on how the proposed action will affect the physical and biological features of the critical habitat in the action area. If there will be only beneficial effects or the effects of the action are expected to be insignificant or discountable, conclude "may affect, not likely to adversely affect" and submit your finding and supporting rationale to our office and request concurrence.
5. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, check IPaC for species-specific Section 7 guidance and conservation measures to determine whether there are any measures that may be implemented to avoid or minimize the negative effects. If you modify your proposed action to include conservation measures, assess how inclusion of those measures will likely change the effects of the action. If you cannot conclude that the effects of the action will be wholly beneficial, insignificant, or discountable, contact our office for assistance.
6. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

For additional information on completing Section 7 Consultation including a Glossary of Terms used in the Section 7 Process, information requirements for completing Section 7, and example letters visit the Midwest Region Section 7 Consultations website at: https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance.

You may find more specific information on completing Section 7 on communication towers and transmission lines on the following websites:

- Incidental Take Beneficial Practices: Power Lines - https://www.fws.gov/story/incidental-take-beneficial-practices-power-lines
- Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning. - https://www.fws.gov/media/recommended-best-practices-communication-tower-design-siting-construction-operation

Tricolored Bat Update

On September 14, 2022, the Service published a proposal in the Federal Register to list the tricolored bat (Perimyotis subflavus) as endangered under the Endangered Species Act (ESA). The Service has up to 12-months from the date the proposal published to make a final determination, either to list the tricolored bat under the Act or to withdraw the proposal. The Service determined the bat faces extinction primarily due to the rangewide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across North America. Because tricolored bat populations have been greatly reduced due to WNS, surviving bat populations are now more vulnerable to other stressors such as human disturbance and habitat loss. Species proposed for listing are not afforded protection under the ESA; however, as soon as a listing becomes effective (typically 30 days after publication of the final rule in the Federal Register), the prohibitions against jeopardizing its continued existence and “take” will apply. Therefore, if your future or existing project has the potential to adversely affect tricolored bats after the potential new listing goes into effect, we recommend that the effects of the project on tricolored bat and their habitat be analyzed to determine whether authorization under ESA section 7 or 10 is necessary. Projects with an existing section 7 biological opinion may require

reinitiation of consultation, and projects with an existing section 10 incidental take permit may require an amendment to provide uninterrupted authorization for covered activities. Contact our office for assistance.

Other Trust Resources and Activities

Bald and Golden Eagles

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act, as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, please contact our office for further coordination. For more information on permits and other eagle information visit our website https://www.fws.gov/library/collections/bald-and-golden-eagle-management.
We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Illinois-Iowa Ecological Services Field Office
Illinois & Iowa Ecological Services Field Office
1511 47th Ave
Moline, IL 61265-7022
(309) 757-5800

PROJECT SUMMARY

Project Code: 2024-0047976
Project Name: Solar CIA - Cortland
Project Type: Power Gen - Solar
Project Description: Proposed solar energy facility
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.91284065,-88.65679019384662,14z



Counties: DeKalb County, Illinois

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ This species only needs to be considered if the project includes wind turbine operations. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ This species only needs to be considered if the project includes wind turbine operations. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Whooping Crane *Grus americana* Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non-Essential

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Eastern Prairie Fringed Orchid *Platanthera leucophaea* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/601	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper

Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

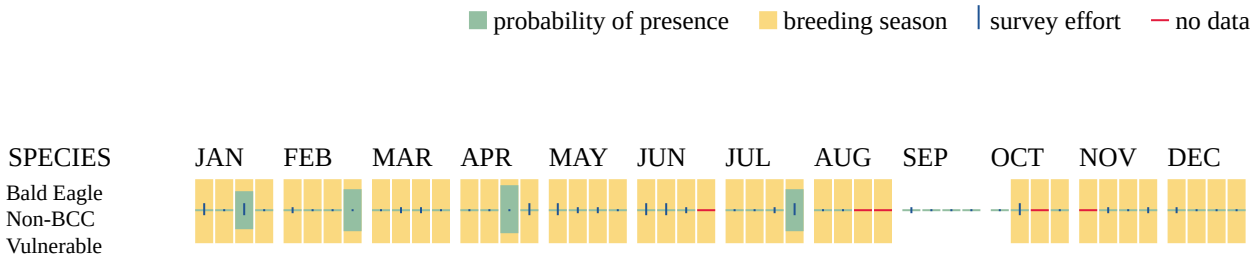
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10561	Breeds elsewhere
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere

NAME	BREEDING SEASON
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Semipalmated Sandpiper *Calidris pusilla* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9603	Breeds elsewhere
Short-billed Dowitcher *Limnodromus griseus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

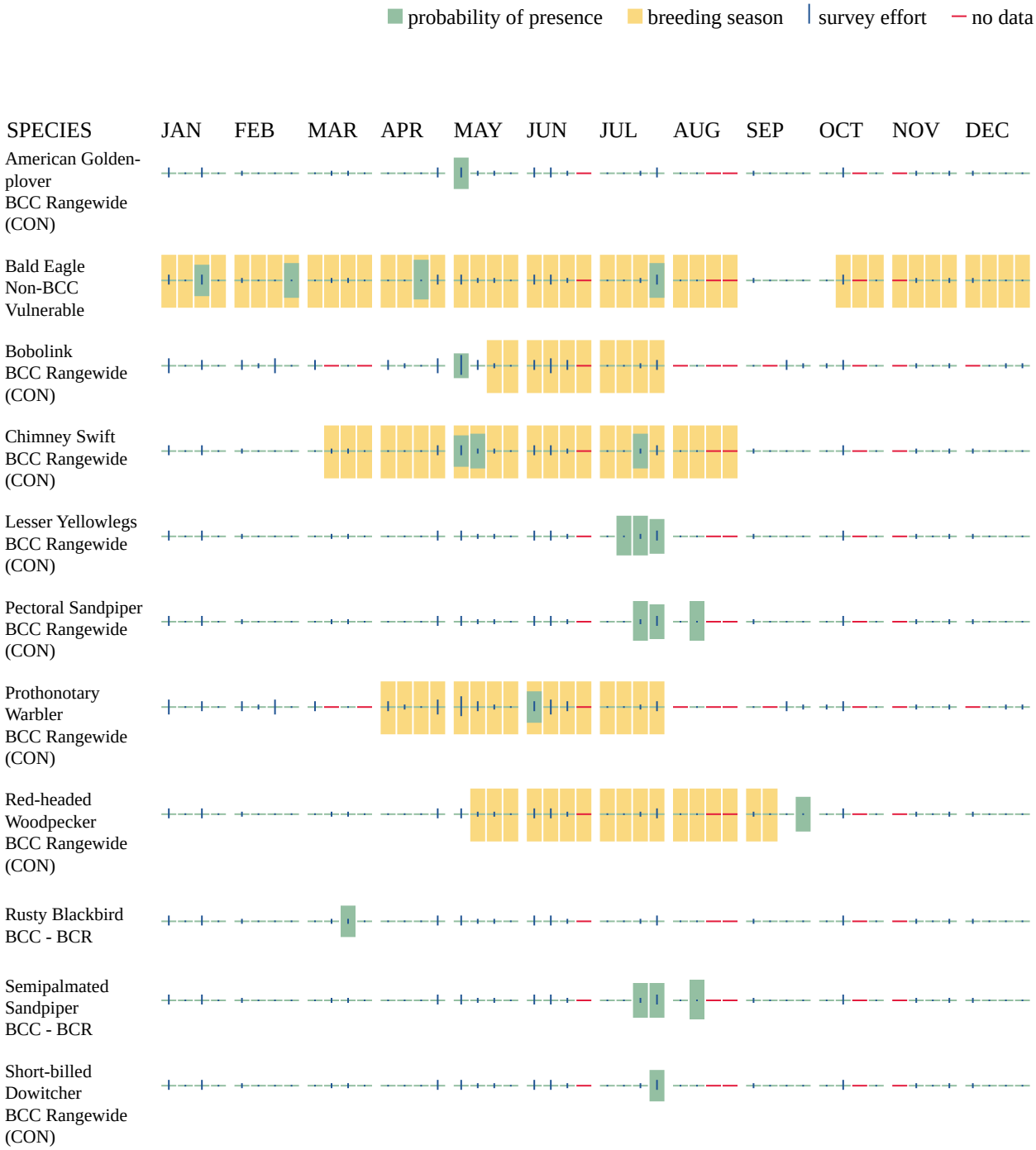
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

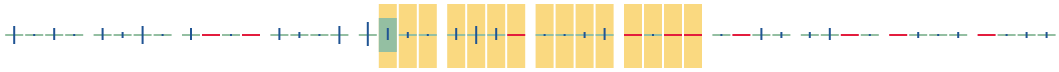
Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Wood Thrush
BCC Rangewide
(CON)



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R2UBHx

IPAC USER CONTACT INFORMATION

Agency:	WSB
Name:	Hayden Garza
Address:	2700 La Frontera Blvd
Address Line 2:	Suite 110
City:	Round Rock
State:	TX
Zip:	78681
Email	hgarza@wsbeng.com
Phone:	5127364511

Appendix F: Decommissioning Plan

Cortland Solar Site
Decommissioning Plan

WSB

Project No. 024543-000

Engineer Certification

I hereby certify that this Decommissioning Plan was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Illinois.

Jared D. Dummer

062-071280	October 21, 2025
Jared D. Dummer, P.E.	IL Registration No.	Date

SOLARSTONE

Solar Site Decommissioning Plan

I) Introduction

All decommissioning and restoration activities will adhere to the requirements of appropriate governing authorities, and in accordance with all federal, state and local permits. The decommissioning and restoration process comprises the removal of above and below ground structures and restoration of topsoil.

II) Procedures For Decommissioning After Ceasing Operation

The Project consists of numerous recyclable materials, including glass, semiconductor material, steel, wood, aluminum, copper, and plastics. When the Project reaches the end of its operational life, the component parts can be dismantled and recycled. The Project components will be dismantled and removed using minimal impact conventional construction equipment and recycled or disposed of safely.

III) Conditions of the Agricultural Impact Mitigation Agreement (AIMA)

An Agricultural Impact Mitigation Agreement (AIMA) does apply to this project. Conditions of the AIMA are listed below. The mitigative actions specified in the Construction and Deconstruction Standards and Policies outlined in the AIMA and as set forth below shall be implemented.

A. All Deconstruction activities may be subject to the Town of Cortland and local requirements. However, the specifications outlined in the AIMA shall be the minimum standards applied to all Construction or Deconstruction activities.

B. All mitigative actions are subject to modification through negotiation by Landowners and a representative of the Commercial Solar Energy Facility Owner, provided such changes are negotiated in advance of Deconstruction activities.

C. No later than 45 days prior to the Deconstruction of a Commercial Solar Energy Facility, the Commercial Solar Energy Facility Owner will provide the Landowner(s) with a telephone number the Landowner can call to alert the Owner should the Landowner(s) have questions or concerns with the work which is being done or has been carried out on his/her property.

D. If there is a change in ownership of the Commercial Solar Energy Facility, the Commercial Solar Energy Facility Owner assuming ownership of the facility shall provide written notice within 90 days to the Town of Cortland and to Landowners of such and the existing Financial Assurance requirements, plus the other terms of the

AIMA, shall apply to the new Owner.

IV) Deconstruction of Commercial Solar Energy Facilities

A. The Commercial Solar Energy Facility Owner shall, at its expense, complete Deconstruction of a Commercial Solar Energy Facility within six (6) months after the end of the Useful Life of the Commercial Solar Energy Facility.

B. Deconstruction of a Commercial Solar Energy Facility shall include the removal/disposition of all solar related equipment/facilities, including the following utilized for operation of all Commercial Solar Energy Facility and located on Landowner property:

1. Solar Panels, cells and modules;
2. Solar panel mounts and racking, including any helical piles, ground screws, ballasts, or other anchoring systems;
3. Solar panel foundations, if used (to depth of 5 feet);
4. Transformers, inverters, energy storage facilities, or substations, including all components and foundations; however, electrical collection cables at a depth of 5 feet or greater may be left in place;
5. Overhead collection system components;
6. Operations/maintenance buildings, spare parts buildings and substation/switching gear buildings unless otherwise agreed to by the Landowner;
7. Access Roads(s) unless Landowner requests in writing that the access road is to remain;
8. Operation/maintenance yard/staging area unless otherwise agreed to by the Landowner; and
9. Debris and litter generated by Deconstruction and Deconstruction crews.

V) Table 1: Equipment Dismantling and Removal

Structures	Activity
Above Ground	
PV Arrays	• Disconnect all above ground wirings, cables and electrical interconnections. • Remove PV modules from racks, temporarily store on-site in delineated area before removal by truck to appropriate facility(ies). • Dismantle and remove all racks and support structures, including extraction of in-ground support structures (see below). Temporarily store on-site before removal by truck to recycling facility.
Inverter units and transformers	• Disconnect and remove all electrical equipment. • Remove inverters and associated components including combiners, low voltage switchgear

	and medium voltage transformers and transport off-site to appropriate facility. • Unbolt substation transformer and remove from the foundation with a crane. • If concrete foundations have been used for inverter units or substation, they will be removed (see below).
Access roads and other components	• Consult with landowner(s) to determine if access roads should be left in place for their continued use. • If one or more access roads are removed after consultation with the landowner(s), the aggregate materials will be excavated by a backhoe/front-end loader, along with any underlying geotextile fabric. • All compacted areas will be tilled in a manner adequate to restore the sub-grade material to the proper density and depth, consistent with the surrounding fields. Clean, compatible subgrade material, followed by topsoil will be applied as necessary. • Above ground lines and poles will be removed along with associated equipment (isolation switches, fuses, metering) and holes will be filled in with clean fill or onsite fill. • Removal of the perimeter fencing, followed by removal of fence pole foundations will be completed.
Below-ground Structures	
Underground cables	• Underground electrical lines running between inverters and the substation will be removed.
Equipment foundations	• The substation, inverter units and steel racking for the solar modules will have foundations that require removal. These foundations will likely consist of steel piles but may also include concrete. Other underground infrastructure requiring removal may include concrete protective electrical structures. It is anticipated that structures will be fully removed from the ground and that the affected area shall be backfilled as

	necessary. • In the event that a structure breaks during excavation, all broken portions will be removed by the EPC contractor. Waste concrete will be recycled off-site by a concrete recycler or crushed on-site and used as backfill material. • All foundation materials will be removed from the site via truck and managed at appropriate facilities.

VI) Table 2: Management of Excess Material and Waste

Material/Waste	Activity
PV panels	A. If there is no possibility for reuse of panels will either be returned to the manufacturer for appropriate recycling/disposal or will be transported to a recycling facility where the glass, metal and semiconductor materials will be separated and recycled. Panels will be managed as per best management practices that may be in effect at the time of decommissioning.
Metal array mounting racks and steel supports	B. These materials will be recycled off-site at an approved facility.
Transformers and substation components	C. Oil from the transformers will be removed on-site to reduce the potential for spills and will be transported to an approved facility for disposal. The substation transformer and step-up transformers in the inverter units will be transported off-site to be sent back to the manufacturer, recycled, reused, or safely disposed off-site in accordance with current standards and best practices.
Inverters, fans, fixtures	D. The metal components of the inverters, fans and fixtures will be recycled, where possible. Remaining components will be disposed of in accordance with the standards of the day.
Concrete inverter/transformer foundations	E. Concrete foundations will be broken down and transported by certified and licensed contractor to an approved recycling disposal facility.
Cables and wiring	F. The electrical line that connects the substation to the point of common coupling

	will be disconnected and recycled, if possible, or disposed of at an approved facility. Support poles, if made of untreated wood, will be chipped for reuse. Associated electronic equipment (isolation switches, fuses, metering) will be transported off-site to be sent back to the manufacturer, recycled, reused, or safely disposed off-site in accordance with current standards and best practices.
Fencing	G. Fencing will be removed and recycled at a metal recycling facility.
Debris	H. Any remaining debris on the site will be separated into recyclables/residual wastes and will be transported from the site and managed as appropriate.

VII) Decommissioning Notification

During the Town of Cortland permit process, the Commercial Solar Energy Facility Owner shall file with the town, a Decommissioning Plan. An updated decommissioning plan will be submitted every three to five years after issuance of the special use permit.

VIII) Financial Framework and Estimated Cost for Decommissioning

A. The Commercial Solar Energy Facility Owner shall provide the Town of Cortland with Financial Assurance to cover the estimated costs of Deconstruction of the Commercial Solar Energy Facility. Provision of this Financial Assurance shall be phased in over the first 11 years of the Project's operation as follows.

1. On or before the first anniversary of the Commercial Operation Date, the Commercial Solar Energy Facility Owner shall provide the Town of Cortland with Financial Assurance to cover ten (10) percent of the estimated costs of Deconstruction of the Commercial Solar Energy Facility as determined in the Deconstruction Plan provided during the town permit process.
2. On or before the sixth anniversary of the Commercial Operation Date, the Commercial Solar Energy Facility Owner shall provide the Town of Cortland with Financial Assurance to cover fifty (50) percent of the estimated costs of Deconstruction of the Commercial Solar Energy Facility as determined in the Deconstruction Plan provided during the town permit process.
3. On or before the eleventh anniversary of the Commercial Operation Date, the Commercial Solar Energy Facility Owner shall provide the Town of Cortland with Financial Assurance to cover one hundred (100) percent of the estimated costs of Deconstruction of the commercial Solar Energy Facility as determined in the Deconstruction Plan provided during the tenth year of the Commercial Operation Date.

The Financial Assurance shall not release the surety from liability until the Financial Assurance is replaced. The use of salvage value as a setoff is dependent upon an agreement by the Commercial Solar Facility Owner that all interests in the salvage value are subordinate to that of the Town of Cortland if Abandonment occurs.

B. The Town of Cortland may – but is not required to – reevaluate the estimated costs of Deconstruction of any Commercial Solar Energy Facility after the tenth anniversary and every five years thereafter, of the Commercial Operation Date. Based on any reevaluation, the town may require the changes in the level of Financial Assurance used to calculate the phased coverages described in Section VIII, A. required from the Commercial Solar Energy Facility Owner. If the Town of Cortland is unable to its satisfaction to perform the investigations necessary to approve the Deconstruction Plan filed by the Owner, then the town may select a separate Professional Engineer independent of the Owner to conduct any necessary investigations. The Owner shall be responsible for the cost of any such investigations.

C. Upon Abandonment, the Town of Cortland may take all appropriate actions for Deconstruction, including drawing upon the Financial Assurance.

D. Site specific decommissioning costs for the 5MWac Cortland Illinois Dynamics 1 LLC solar site and the 2MWac Cortland Illinois Dynamics 2 LLC solar site, for a total of 7MWac total on this parcel located in Dekalb County, IL is estimated as follows:

5MWac Cortland Illinois Dynamics 1 LLC

Tasks	Estimated Cost ($)
Mobilization	$23,870
SWPPP Prep and Permit	$8,500
Remove Foundation Posts	$16,470
Remove Panels	$57,500
Dismantle Racks	$28,500
Remove Electrical Equipment	$8,520
Remove Racks	$4,500
Remove Cable	$15,000
Remove Poles	$10,500
Remove Fencing	$21,510
Remove Service Roads	$88,490
Site Restoration	$38,800
Estimated Total (2025 Dollars)	$322,160

2MWac Cortland Illinois Dynamics 2 LLC

Tasks	Estimated Cost ($)
Mobilization	$9,380
SWPPP Prep and Permit	$8,500
Remove Foundation Posts	$7,160
Remove Panels	$25,000
Dismantle Racks	$11,400
Remove Electrical Equipment	$5,920
Remove Racks	$1,800
Remove Cable	$6,000
Remove Poles	$10,500
Remove Fencing	$16,740
Remove Service Roads	$7,000
Site Restoration	$17,130
Estimated Total (2025 Dollars)	$126,530

Appendix G: Level 1 Wetland Analysis

Memorandum

To: Gordon Simanton, SolarStone Partners

From: Shawn Williams, WSB

Copy: Ed Youngquist, WSB
Tom Santori, WSB
Lillian Prybil, WSB

Date: April 3, 2024

Re: Cortland Solar LLC
Offsite Wetland Hydrology Assessment (Level 1 Wetland Delineation)
Cortland Township, DeKalb County, Illinois
WSB Project No. 024543

This memorandum and attachments comprise the offsite wetland hydrology assessment for the proposed Cortland Solar LLC Project (project, site), located in Cortland Township, IL. The site is located northeast of the intersection of State Highway 38 and Chase Road. It is approximately 1.7 miles east of Cortland, on the north side of highway 38. The project will be located within County Parcels 0927300004 and 0927100002. The project area is approximately 81 acres.

A Routine Level 1 (desktop) wetland delineation was performed for the Cortland Solar LLC Site (**Figure 1**). A Level 1 wetland delineation is an off-site review of applicable data sources and imagery that helps determine whether wetlands exist within a review area. The US Army Corps of Engineers – Rock Island District requires an offsite wetland hydrology assessment when delineating wetlands in agricultural fields. Wetlands are a protected water resource and are identified by three (3) criteria. Wetlands have:

1. a **dominance of hydrophytic vegetation** (vegetation adapted to wet conditions),
2. **hydric soil** (soils that are associated with low-oxygen/anaerobic conditions due to saturation or inundation), and
3. **wetland hydrology** (the area is inundated either permanently or periodically, or the soil is saturated in the upper 12 inches of the soil profile for 5% of the growing season (about 14 consecutive days) in most years (over 50%) with “normal” precipitation.

Review Method

WSB reviewed the LiDAR 2-foot contours (**Figure 2**), National Hydrography Dataset (NHD) and FEMA Floodplain (**Figure 3**), USFWS National Wetlands Inventory (NWI) (**Figure 4**), and US Department of Agriculture (USDA) County Soil Survey (**Figure 5**) (**Appendix A**).

WSB reviewed fourteen(14) aerial photos for the years of 1998, 2005, 2006, 2007, 2010, 2011, 2012, 2014, 2015, 2017, 2019, 2020, 2021, and 2023 (NAIP, NAPP) to investigate wetland hydrology in accordance with the US Farm Service Agency (FSA) *Wetland Mapping Conventions for Agricultural Lands*. Available Illinois Geospatial Data Clearing House and Prairie Research Institute and University of Illinois at Urbana-Champaign aerial photography were used for this assessment. Imagery includes the National Agriculture Imagery Program (NAIP) and National Aerial Photography (NAPP) imagery.

701 XENIA AVENUE S | SUITE 300 | MINNEAPOLIS, MN | 55416 | 763.541.4800 | WSBENG.COM

Antecedent precipitation conditions for each year were determined by referencing the WETS table and monthly precipitation records for the DeKalb weather reporting station (**Appendix B**).

Review Results

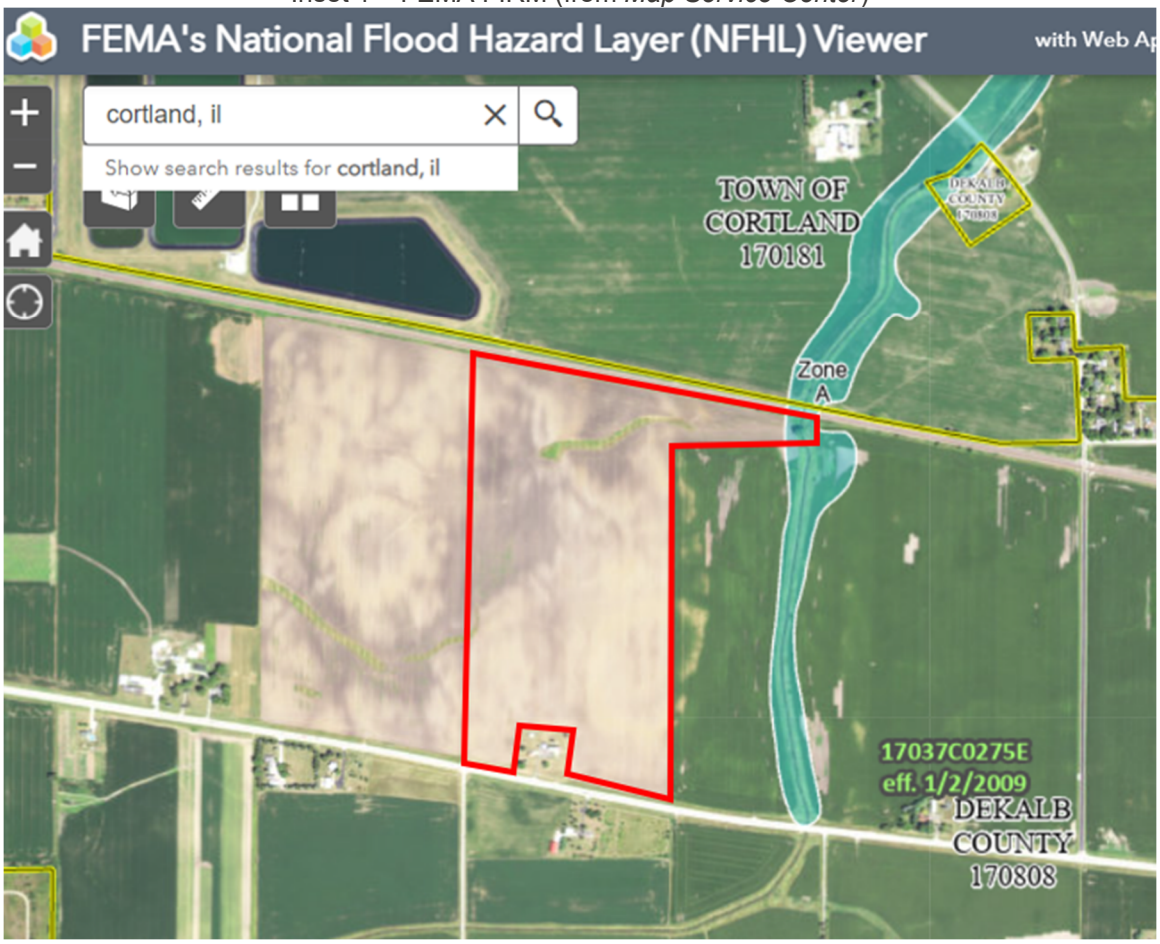
1. *Mapping Results*

The overall topography of the site includes elevations ranging generally between 869 feet above mean sea level (AMSL) at the southeast portion to 845 feet AMSL at the northeast corner, near Union Ditch No. 1. Topographic relief is moderate, with an elevation difference of 24 vertical feet.

One mapped watercourse exists within the site. It is Union Ditch Number 1, a tributary to the South Branch of the Kishwaukee River, which is located 1.6 miles northeast of the site. Water flows from south to north, within the project area.

FEMA FIRM Zone A Flood Hazard Area exists within the project (Inset 1). It is associated with Union Ditch Number 1.

Inset 1 – FEMA FIRM (from *Map Service Center*)



The National Wetlands Inventory map depicts one mapped Riverine Lower Perennial Unconsolidated Bottom Permanently Flooded – Excavated (R2UBHx) watercourse at the northeast corner of the site. It is Union Ditch Number 1.

The mapped soils within the project site show Areas 1, 2 and 3 are located in mapped hydric soil. The soil has a hydric rating of 100 (out of 100) meaning it is poorly drained and likely to support wetlands.

1. *Historic Aerial Review Results*

Three (3) areas of interest were identified within the project site based on review of all aerial photographs, with focus on the wet precipitation year of 2010. The area of review is based on the observation of soil saturation signatures, altered cropping, drainage signatures, and the low area at the northeast associated with Union Ditch Number 1. The areas of interest are indicated on the aerial photographs in **Appendix B**.

Area 1 had wetland hydrology signatures in 5 of 5 normal precipitation years.
Area 2 had wetland hydrology signatures in 5 of 5 normal precipitation years.
Area 3 had wetland hydrology signatures in 4 of 5 normal precipitation years.

Areas 1, 2, and 3 meet the review criteria for wetland hydrology. These three areas should be considered wetland.

Inset 2 – Result Summary
Wetland Determination Matrix

Area 1

Areas 2, 3

Hydric Soils present[1]	Identified on NWI or other wetland map[2]	Percent with wet signatures from Exhibit 1	Field verification required[3]	Wetland?
Yes	Yes	>50%	No	Yes
Yes	Yes	30-50%	No	Yes
Yes	Yes	<30%	Yes	Yes, if other hydrology indicators present
Yes	No	>50%	No	Yes
Yes	No	30-50%	Yes	Yes, if other hydrology indicators present
Yes	No	<30%	No	No
No	Yes	>50%	No	Yes
No	Yes	30-50%	No	Yes
No	Yes	<30%	No	No
No	No	>50%	Yes	Yes, if other hydrology indicators present
No	No	30-50%	Yes	Yes, if other hydrology indicators present
No	No	<30%	No	No

[1] The presence of hydric soils can be determined from the "Hydric Rating by Map Unit Feature" under "Land Classifications" from the Web Soil Survey. "Not Hydric" is the only category considered to not have hydric soils. Field sampling for the presence/absence of hydric soil indicators can be used in lieu of the hydric rating if appropriately documented by providing completed field data sheets.

[2] At minimum, the most updated NWI data available for the area must be reviewed for this step. Any and all other local or regional wetland maps that are publically available should be reviewed.

[3] Area should be reviewed in the field for the presence/absence of wetland hydrology indicators per the applicable 87 Manual Regional Supplement, including the D2 indicator (geomorphic position).

Conclusion

The offsite wetland hydrology assessment indicates wetland hydrology exists at Areas 1, 2, and 3. A Routine Level 2 (onsite) wetland delineation is not required per the wetland determination matrix, but can be completed if requested.

Official wetland boundary/type approval will require verification and coordination with the US Army Corps of Engineers – Rock Island District.

Please contact Shawn Williams at 612-360-1305 or swilliams@wsbeng.com if you have questions or require additional information regarding this offsite wetland hydrology assessment (Level 1 delineation).

Appendix A: Figures

1. Project Location
2. Topography
3. National Hydrography Dataset and FEMA Floodplain
4. National Wetlands Inventory
5. County Soil Survey

Appendix B: Hydrology Assessment Forms and Aerial Photography

Appendix A
Figures

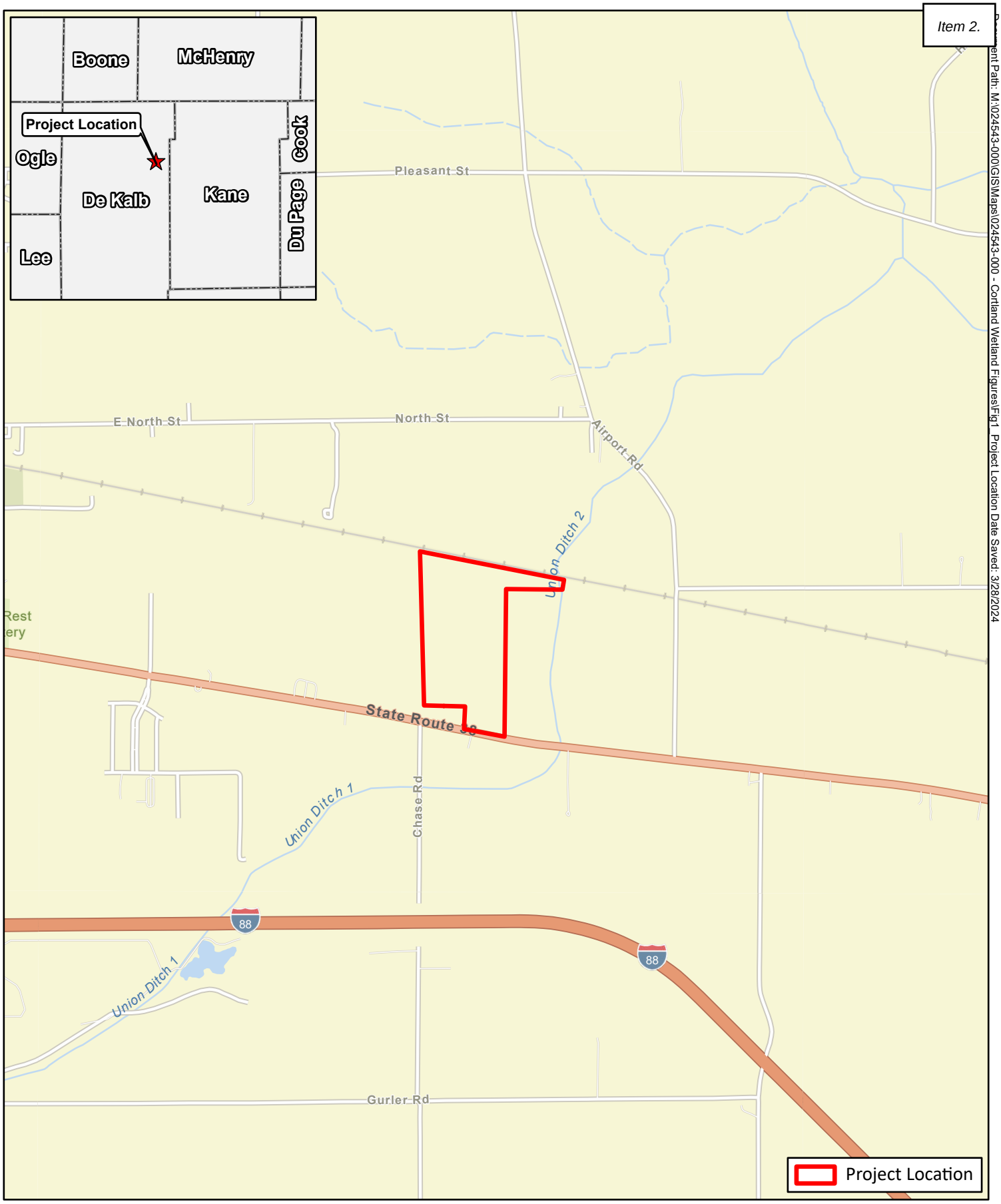


Figure 1 - Project Location

Cortland Solar LLC
DeKalb County, IL

SOLARSTONE

N

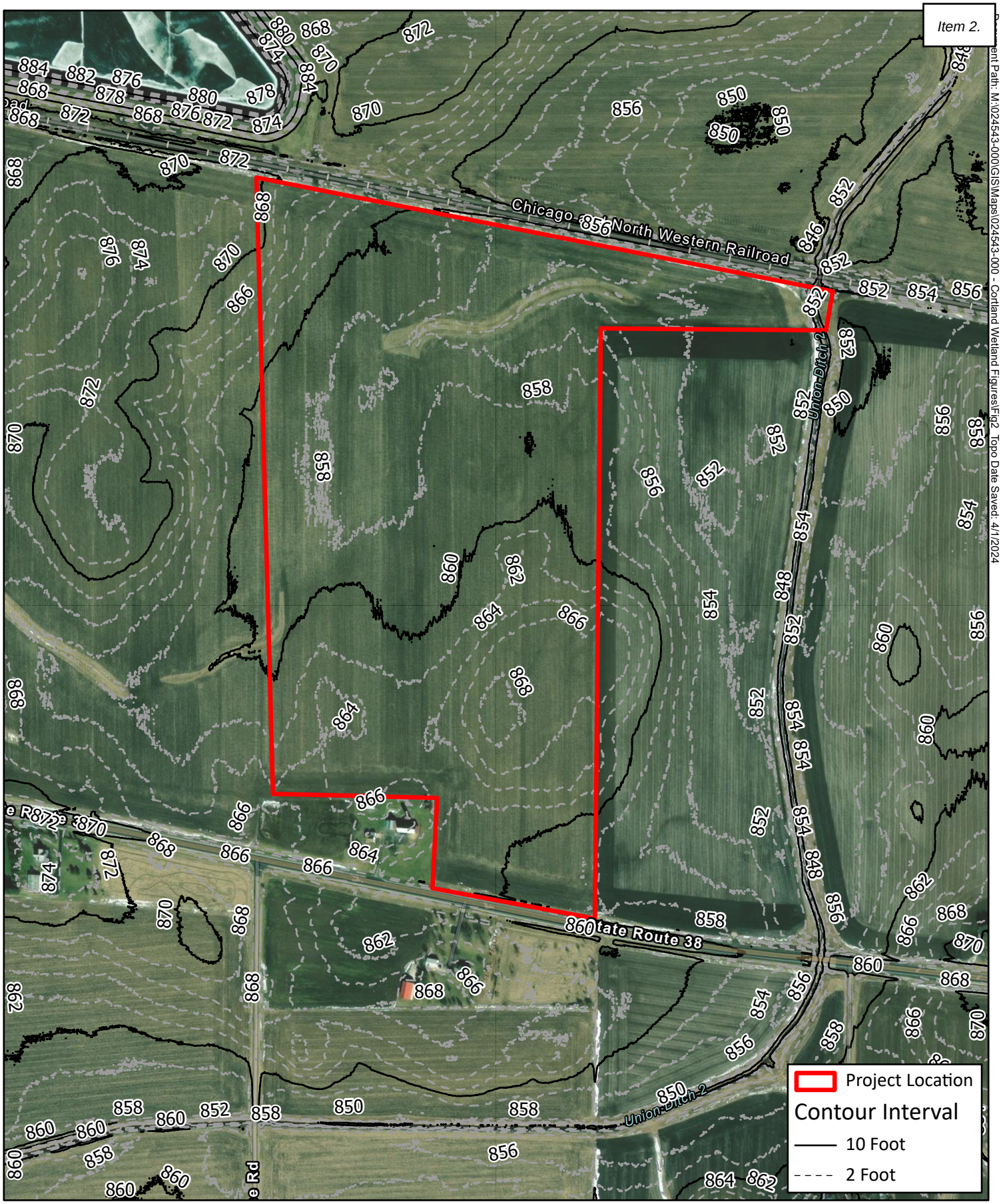
0 2,000 Feet

1 inch = 2,000 feet

wsb

550

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SOLARSTONE

Figure 2 - Topography

Cortland Solar LLC
DeKalb County, IL

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0 500 Feet

1 inch = 500 feet

wsb

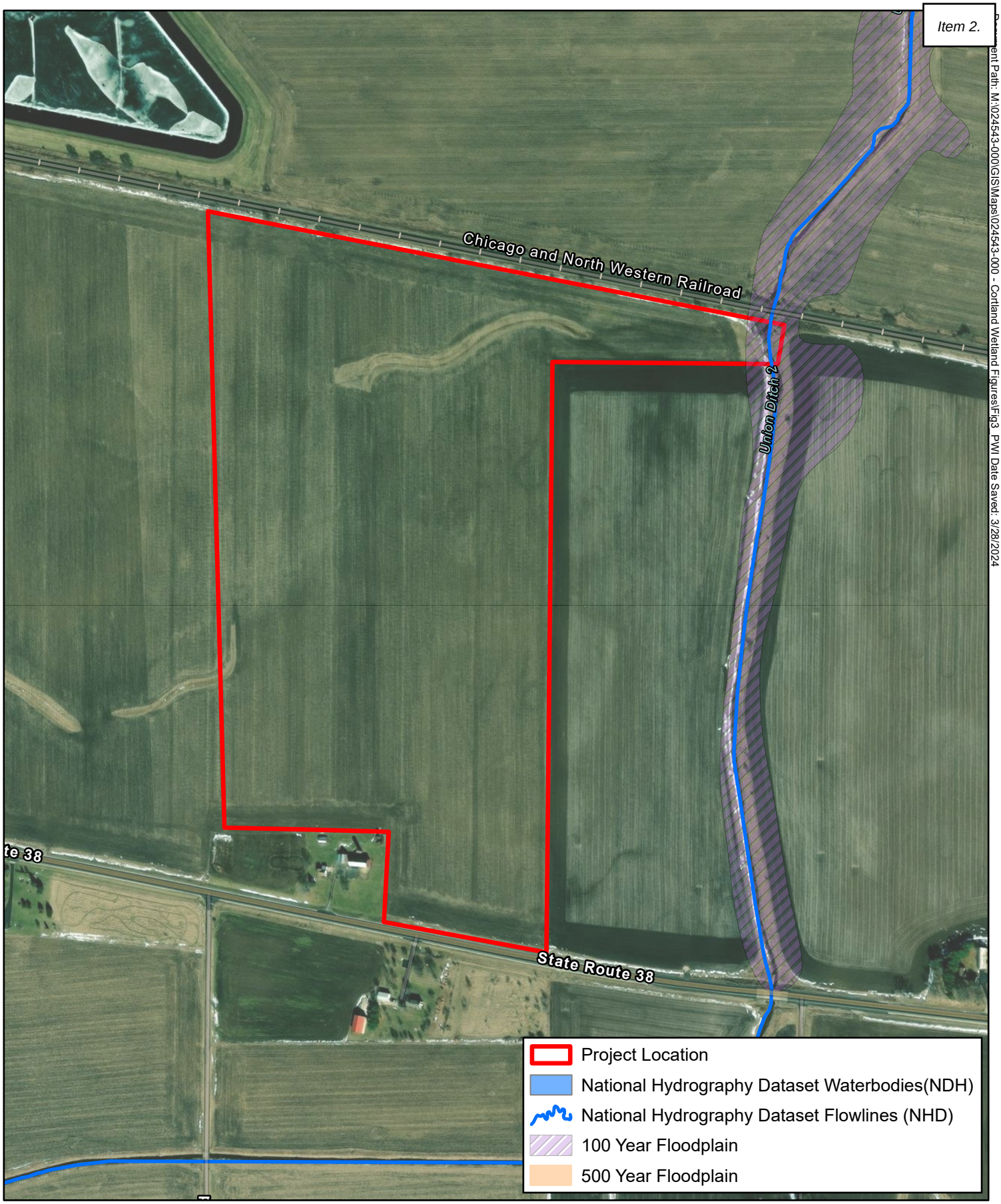


Figure 3 - National Hydrography Dataset (NHD) and Floodplain

SOLARSTONE

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet
1 inch = 500 feet

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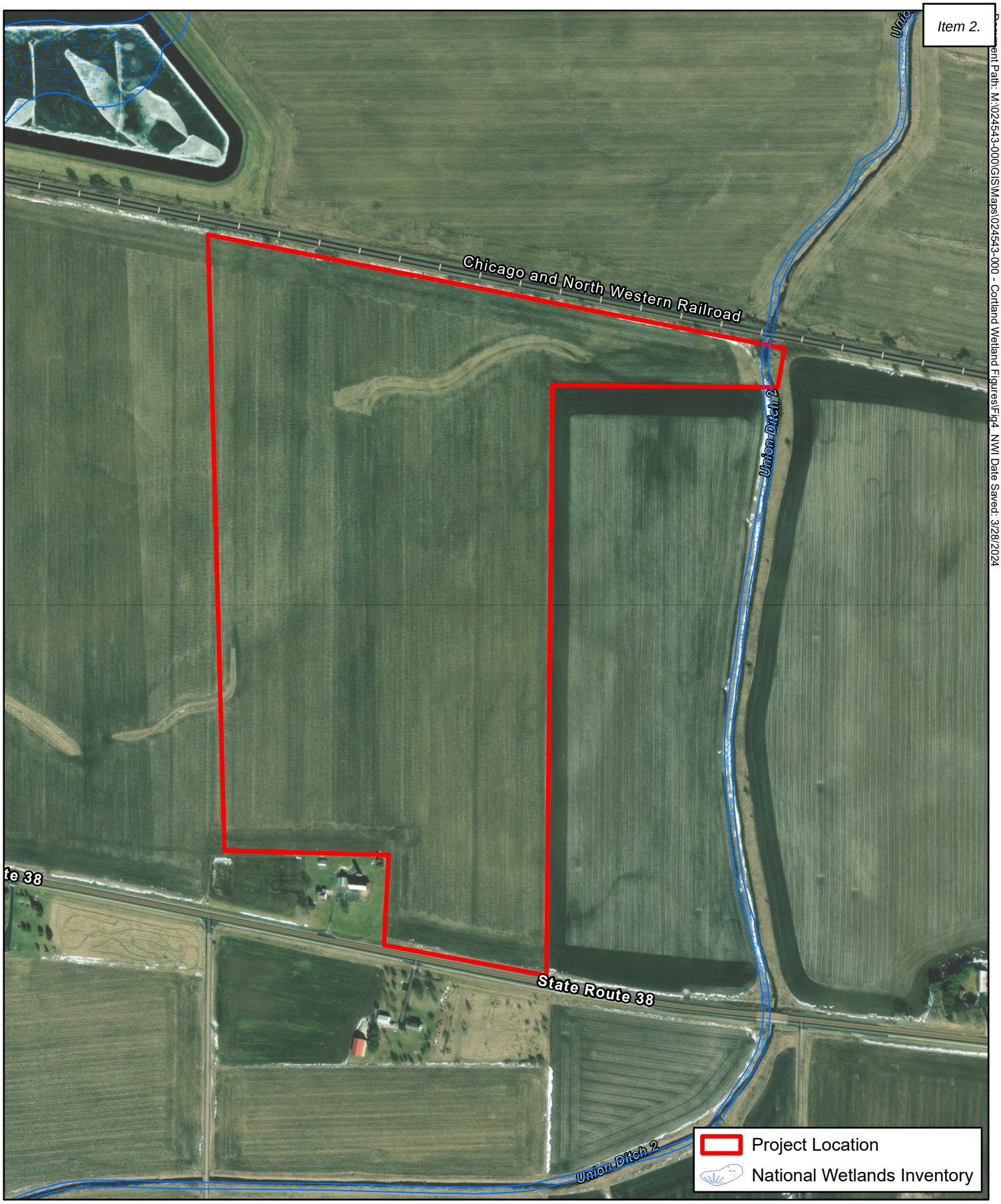


Figure 4 - National Wetlands Inventory

SOLARSTONE

Cortland Solar LLC
DeKalb County, IL

N

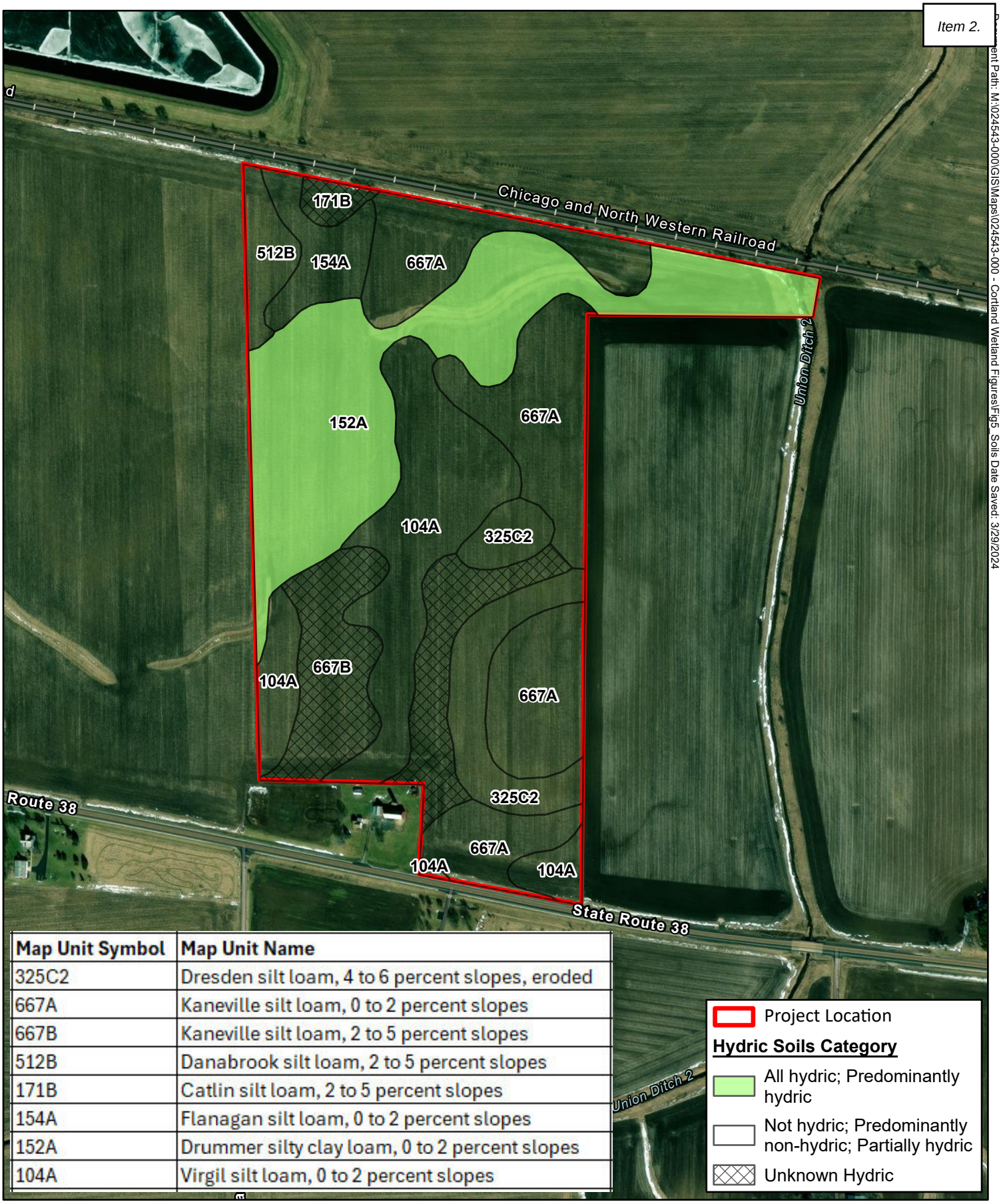
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1 inch = 500 feet

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Map Unit Symbol	Map Unit Name
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded
667A	Kaneville silt loam, 0 to 2 percent slopes
667B	Kaneville silt loam, 2 to 5 percent slopes
512B	Danabrook silt loam, 2 to 5 percent slopes
171B	Catlin silt loam, 2 to 5 percent slopes
154A	Flanagan silt loam, 0 to 2 percent slopes
152A	Drummer silty clay loam, 0 to 2 percent slopes
104A	Virgil silt loam, 0 to 2 percent slopes

SOLARSTONE

Figure 5 - County Soil Survey

Cortland Solar LLC
DeKalb County, IL

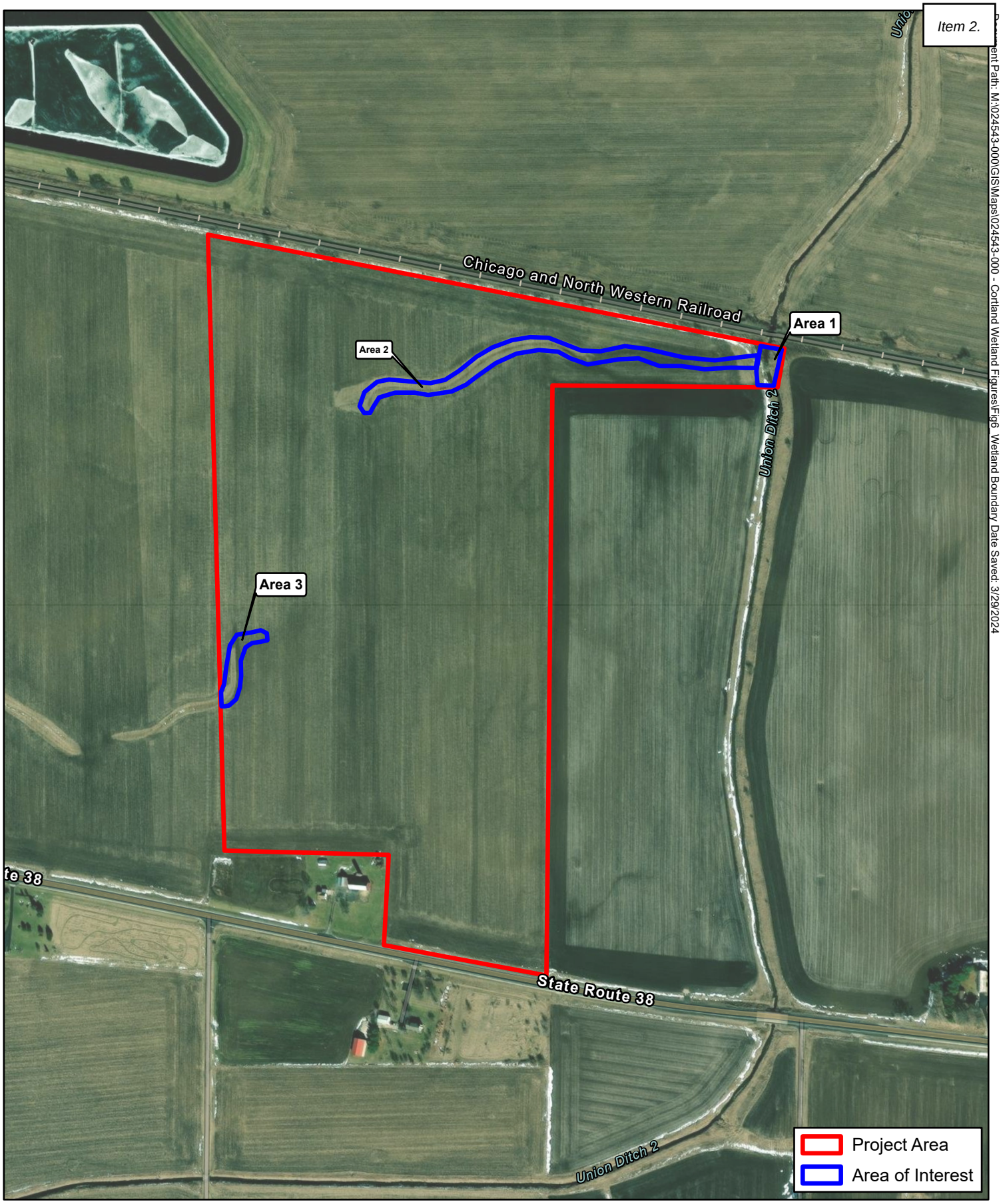
N

0 500 Feet

1 inch = 500 feet

wsb

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SOLARSTONE

Figure 6 - Wetland Delineation

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

Appendix B
Hydrology Assessment Forms and Aerial Photography

Exhibit 1

Hydrology Assessment with Aerial Imagery – Recording Form

Project Name Cortland Solar LLC Date 3/1/2024 County DeKalb

Investigator WSB (Shawn Williams) Legal Description (Sec, T, R) Sec. 27, T40N, R5E

Year	Image Source	Climate Condition (wet, dry, normal)[1]	Interpretation (list hydrology indicators observed, e.g. crop stress, drowned out, standing water, etc.)[2]			
			Area 1	Area 2	Area 3	Area
1998	NAIP	Wet	WS	WS	NV	
2004	NAIP					
2005	NAIP	Dry	WS	WS	NV	
2006	NAIP	Wet	WS	CS	CS	
2007	NAIP	Dry	WS	AP	NV	
2008	NAIP					
2009	NAIP					
2010	NAIP	Wet	WS	CS	CS	
2011	NAIP	Wet	WS	CS	NV	
2012	NAIP	Dry	WS	CS	NV	
2013	NAIP					
2014	NAIP	Dry	WS	NV	NV	
2015	NAIP	Normal	WS	CS	CS	
2016	NAIP					
2017	NAIP	Normal	WS	CS	CS	
2018	NAIP					
2019	NAIP	Dry	WS	WS	WS	
2020	NAIP	Normal	WS	DO	DO	
2021	NAIP	Normal	WS	WS	WS	
2022	NAIP					
2023	NAIP	Normal	WS	WS	NV	

Summary Table

	Area 1	Area 2	Area 3	Area
# Normal Yrs.	5	5	5	
# Normal Yrs with wet signatures	5	5	4	
% Normal Yrs with wet signatures	100	100	80	

[1]Use AGACIS website to determine USDA/NRCS climate condition for parcel being investigated.

[2]Use key below to label photo interpretations. It is imperative that the reviewer read and understand the guidance associated with the use of these labels. If alternate labels are used, indicate in box below.

WS – wetland signature
CS – vegetation stress
DO – drowned out
NC – not cropped
SW – standing water
AP – altered pattern
NV – normal vegetative cover

Wetland Determination Matrix

Hydric Soils present[1]	Identified on NWI or other wetland map[2]	Percent with wet signatures from Exhibit 1	Field verification required[3]	Wetland?
Yes	Yes	>50%	No	Yes
Yes	Yes	30-50%	No	Yes
Yes	Yes	<30%	Yes	Yes, if other hydrology indicators present
Yes	No	>50%	No	Yes
Yes	No	30-50%	Yes	Yes, if other hydrology indicators present
Yes	No	<30%	No	No
No	Yes	>50%	No	Yes
No	Yes	30-50%	No	Yes
No	Yes	<30%	No	No
No	No	>50%	Yes	Yes, if other hydrology indicators present
No	No	30-50%	Yes	Yes, if other hydrology indicators present
No	No	<30%	No	No

[1] The presence of hydric soils can be determined from the "Hydric Rating by Map Unit Feature" under "Land Classifications" from the Web Soil Survey. "Not Hydric" is the only category considered to not have hydric soils. Field sampling for the presence/absence of hydric soil indicators can be used in lieu of the hydric rating if appropriately documented by providing completed field data sheets.

[2] At minimum, the most updated NWI data available for the area must be reviewed for this step. Any and all other local or regional wetland maps that are publically available should be reviewed.

[3] Area should be reviewed in the field for the presence/absence of wetland hydrology indicators per the applicable 87 Manual Regional Supplement, including the D2 indicator (geomorphic position).

Monthly Total Precipitation for DE KALB, IL

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1998	2.79	1.61	3.22	5.88	4.78	4.07	4.01	5.20	2.22	5.80	2.07	1.32	42.97
1999	3.42	1.18	0.91	5.67	4.99	6.90	4.77	2.64	5.34	0.72	0.34	2.20	39.08
2000	1.59	2.00	0.91	3.46	3.38	8.79	3.33	M	4.63	1.17	2.74	1.83	M
2001	1.87	2.42	1.04	3.03	3.04	4.64	0.86	3.20	8.09	5.42	1.71	0.98	36.30
2002	0.74	1.24	1.90	3.76	5.48	5.03	0.65	6.74	1.62	2.31	0.49	0.84	30.80
2003	0.51	0.21	1.28	1.50	7.79	1.85	3.16	1.16	2.49	1.78	3.67	3.03	28.43
2004	0.50	0.98	4.18	1.88	10.44	2.83	3.93	3.35	0.65	2.89	2.67	1.11	35.41
2005	2.53	2.75	0.68	1.72	2.75	1.13	2.83	4.15	1.53	0.53	2.29	1.12	24.01
2006	2.92	0.81	3.47	3.49	3.64	3.11	2.41	2.58	3.83	3.89	2.70	3.07	35.92
2007	1.01	1.62	3.55	3.52	2.26	4.09	8.20	12.02	0.44	2.48	0.85	3.43	43.47
2008	1.59	3.88	1.64	4.37	4.95	3.26	5.76	1.95	9.39	2.71	1.11	5.85	46.46
2009	0.88	2.46	5.00	4.35	4.81	6.16	M	6.22	1.18	6.40	1.24	4.26	M
2010	0.87	1.02	1.69	3.46	5.67	6.53	6.92	2.96	2.04	1.74	1.06	1.32	35.28
2011	0.65	2.65	2.21	4.41	5.54	4.53	5.28	5.29	3.82	1.28	4.21	2.54	42.41
2012	1.41	1.60	1.38	2.96	1.26	2.16	3.69	1.86	2.37	M	0.58	1.80	M
2013	3.48	2.66	1.89	8.24	3.17	7.38	1.33	4.19	1.50	2.20	2.08	1.41	39.53
2014	1.67	2.33	0.80	2.75	3.01	8.74	3.66	5.19	3.13	2.70	1.33	0.70	36.01
2015	1.09	1.02	0.55	3.80	5.82	8.20	3.20	3.04	2.74	1.45	5.43	5.46	41.80
2016	0.38	0.71	2.91	2.25	7.24	3.36	5.30	7.70	2.17	2.25	2.78	1.44	38.49
2017	2.22	0.82	4.35	5.19	4.76	3.50	7.78	1.89	0.09	8.65	1.60	0.43	41.28
2018	1.32	2.76	1.50	M	7.27	8.81	2.15	3.88	2.50	3.99	2.40	1.81	M
2019	2.35	2.37	2.11	4.10	7.80	2.69	1.87	3.72	9.56	5.99	1.50	1.76	45.82
2020	2.68	0.58	4.18	3.40	6.22	2.48	4.43	0.70	5.36	2.35	M	1.93	M
2021	1.84	0.80	2.30	1.25	2.91	M	3.01	M	M	6.50	0.44	1.58	M
2022	0.79	1.23	2.28	4.03	4.17	3.21	4.31	9.33	2.64	2.05	0.88	2.11	37.03
2023	1.95	2.78	1.97	3.04	1.44	2.19	5.61	2.10	2.68	3.22	0.54	2.46	29.98
2024	3.12	M	M	M	M	M	M	M	M	M	M	M	M
Mean	1.71	1.71	2.23	3.66	4.79	4.63	3.94	4.21	3.28	3.22	1.87	2.15	37.52

WETS Station: DE KALB, IL

Requested years: 1991 - 2020

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	28.1	13.1	20.6	1.69	1.07	1.99	5	10.2
Feb	32.5	16.6	24.6	1.71	1.02	2.07	4	8.7
Mar	45.0	26.8	35.9	2.24	1.45	2.69	5	4.4
Apr	58.6	37.3	48.0	3.56	2.56	4.17	7	1.3
May	70.2	49.2	59.7	4.79	3.28	5.87	8	0.0
Jun	79.9	59.5	69.7	4.57	2.77	5.53	7	0.0
Jul	83.1	63.3	73.2	4.00	2.49	4.80	6	0.0
Aug	81.2	61.3	71.3	4.06	2.69	4.84	6	0.0
Sep	74.9	53.2	64.1	3.32	1.73	4.05	6	0.0
Oct	62.0	41.0	51.5	2.96	1.76	3.58	6	0.1
Nov	46.3	29.6	38.0	2.31	1.38	2.73	5	1.8
Dec	33.6	19.1	26.4	2.04	1.27	2.44	5	6.6
Annual:					33.97	40.71		
Average	58.0	39.2	48.6	-	-	-	-	-
Total	-	-	-	37.25			70	33.1

GROWING SEASON DATES

Years with missing data:	24 deg = 3	28 deg = 3	32 deg = 2
Years with no occurrence:	24 deg = 0	28 deg = 0	32 deg = 0
Data years used:	24 deg = 27	28 deg = 27	32 deg = 28
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	4/1 to 11/8: 221 days	4/12 to 10/25: 196 days	4/23 to 10/16: 176 days
70 percent *	3/28 to 11/13: 230 days	4/7 to 10/30: 206 days	4/18 to 10/21: 186 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1966			1.20	3.25	3.07	2.78	1.45	2.51	2.47	2.47	4.91	2.32	26.43
1967	2.75	1.17	2.07	5.09	1.46	5.14	2.76	2.60	1.81	3.62	2.00	0.96	31.43
1968	0.45	0.52	0.32	2.10	2.48	5.47	5.22	4.06	M4.90	0.78	3.52	1.90	31.72
1969	1.31		M0.04	4.33	3.48	6.38	5.28	1.45	2.85	6.75	1.32	1.47	34.66
1970	0.94	0.56	1.84	2.73	6.01	6.57	6.03	1.11	11.56	2.69	1.68	1.35	43.07
1971	1.17	2.06	1.87	1.34	1.73	2.20	2.01	3.26	2.80	2.04	2.14	4.62	27.24
1972	0.91	0.86	3.95	4.57	4.00	8.81	5.33	8.34	5.08	3.86	1.83	2.10	49.64
1973	1.32	1.04	4.14	6.50	5.49	3.18	2.22	1.93	5.95	3.36	3.01	3.13	41.27
1974	4.08	1.65	2.04	3.43	6.42	6.94	2.08	2.09	0.85	2.31	2.84	1.96	36.69



Aerial Map - 1998

SOLARSTONE

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

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NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	1998
Photo/obs Date	4/1/1998	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

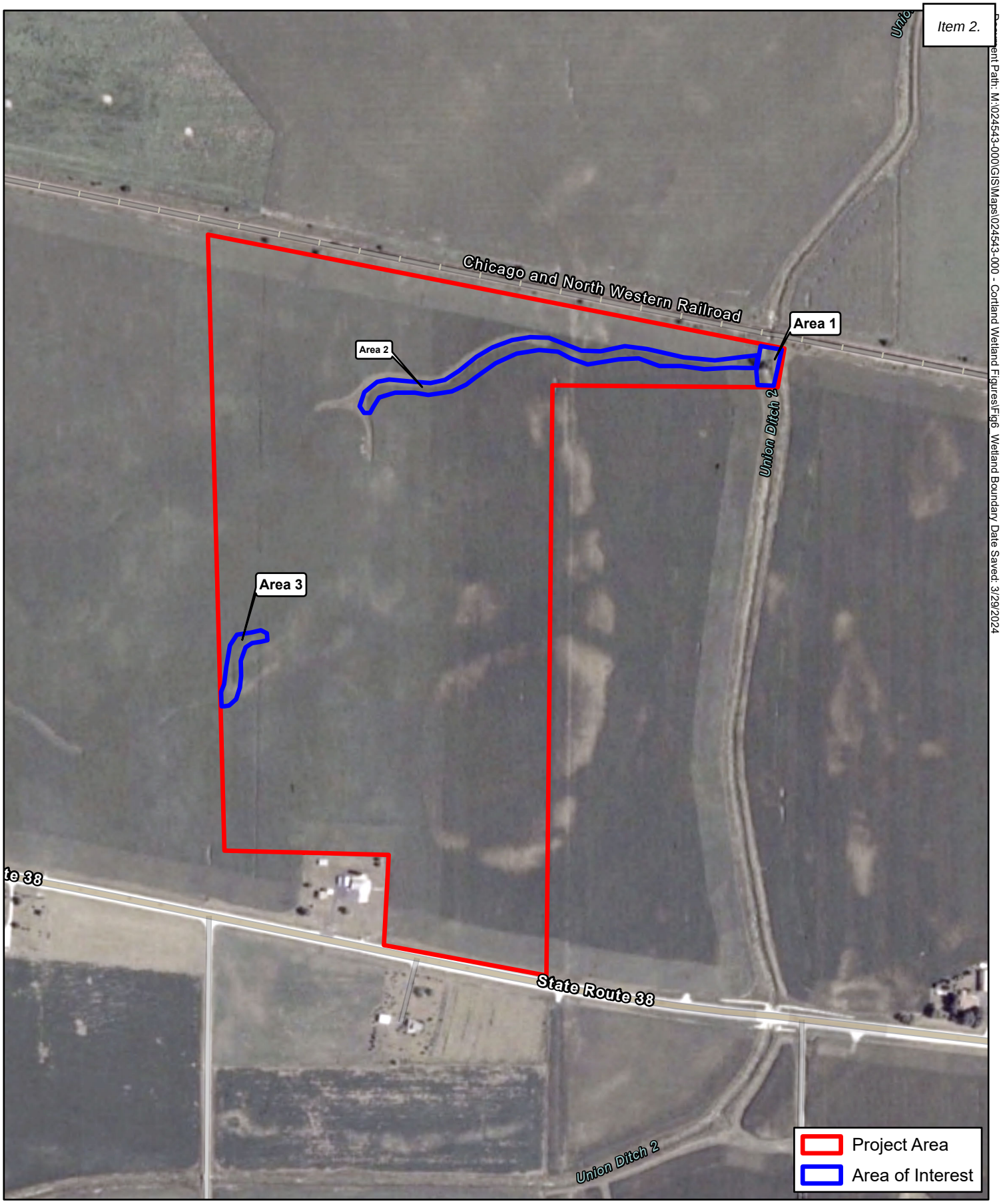
	Month	30% chance <	30% chance >	Precip	Condition **D**ry, **W**et, **N**ormal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	March	1.45	2.69	3.22	W	3	3	9
2nd Prior Month*	February	1.02	2.07	1.61	N	2	2	4
3rd Prior Month*	January	1.07	1.99	2.79	W	3	1	3
							Sum	**16**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been wetter than normal**



Aerial Map - 2005

SOLARSTONE

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

563

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NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2005
Photo/obs Date	7/1/2005	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

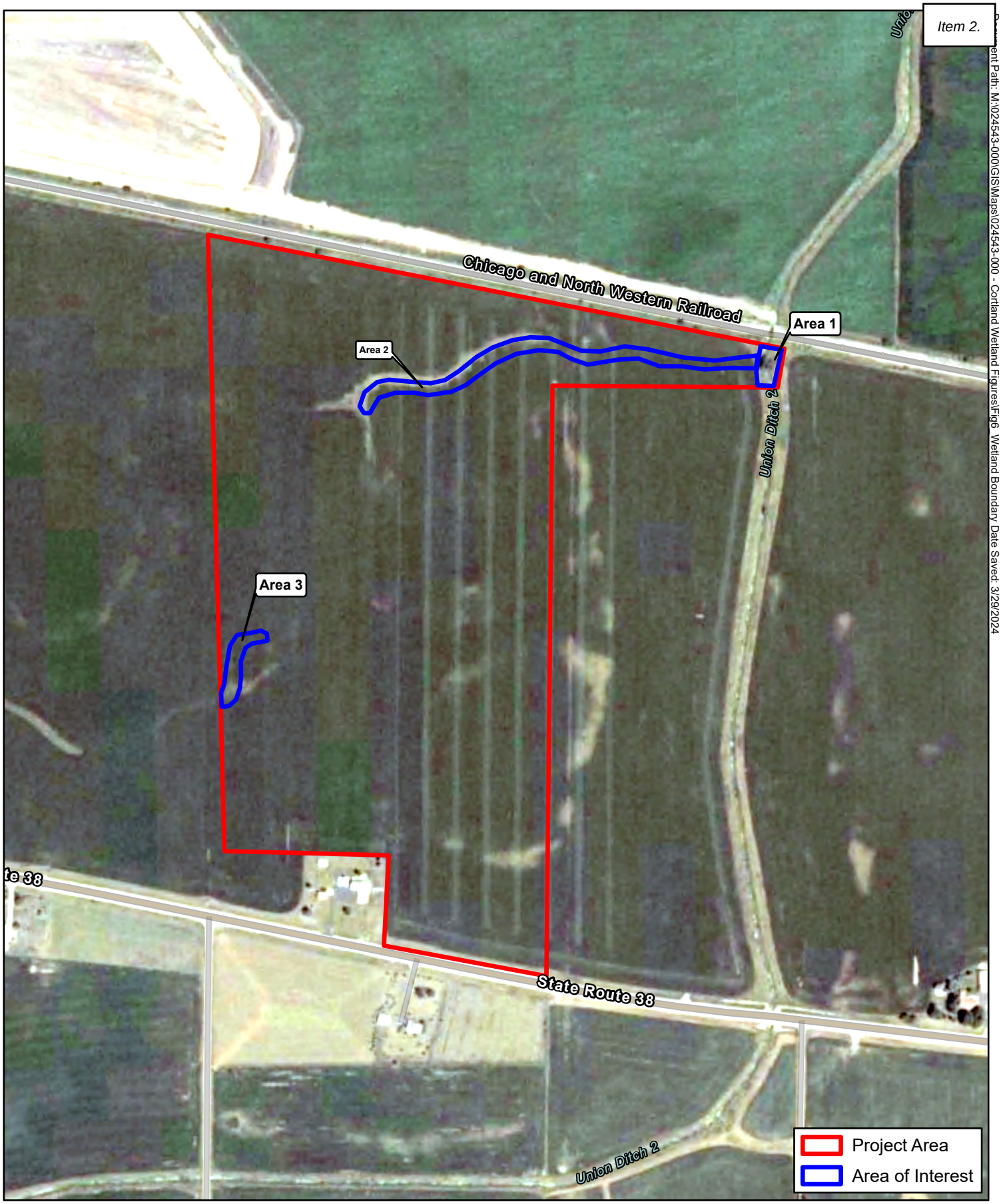
	Month	30% chance <	30% chance >	Precip	Condition **D**ry, **W**et, **N**ormal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	June	2.77	5.53	1.13	D	1	3	3
2nd Prior Month*	May	3.28	5.87	2.75	D	1	2	2
3rd Prior Month*	April	2.56	4.17	1.72	D	1	1	1
							Sum	**6**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been drier than normal**



Aerial Map - 2006

Cortland Solar LLC
DeKalb County, IL

SOLARSTONE

N

0 500 Feet

1 inch = 500 feet

wsb

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NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2006
Photo/obs Date	6/1/2006	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

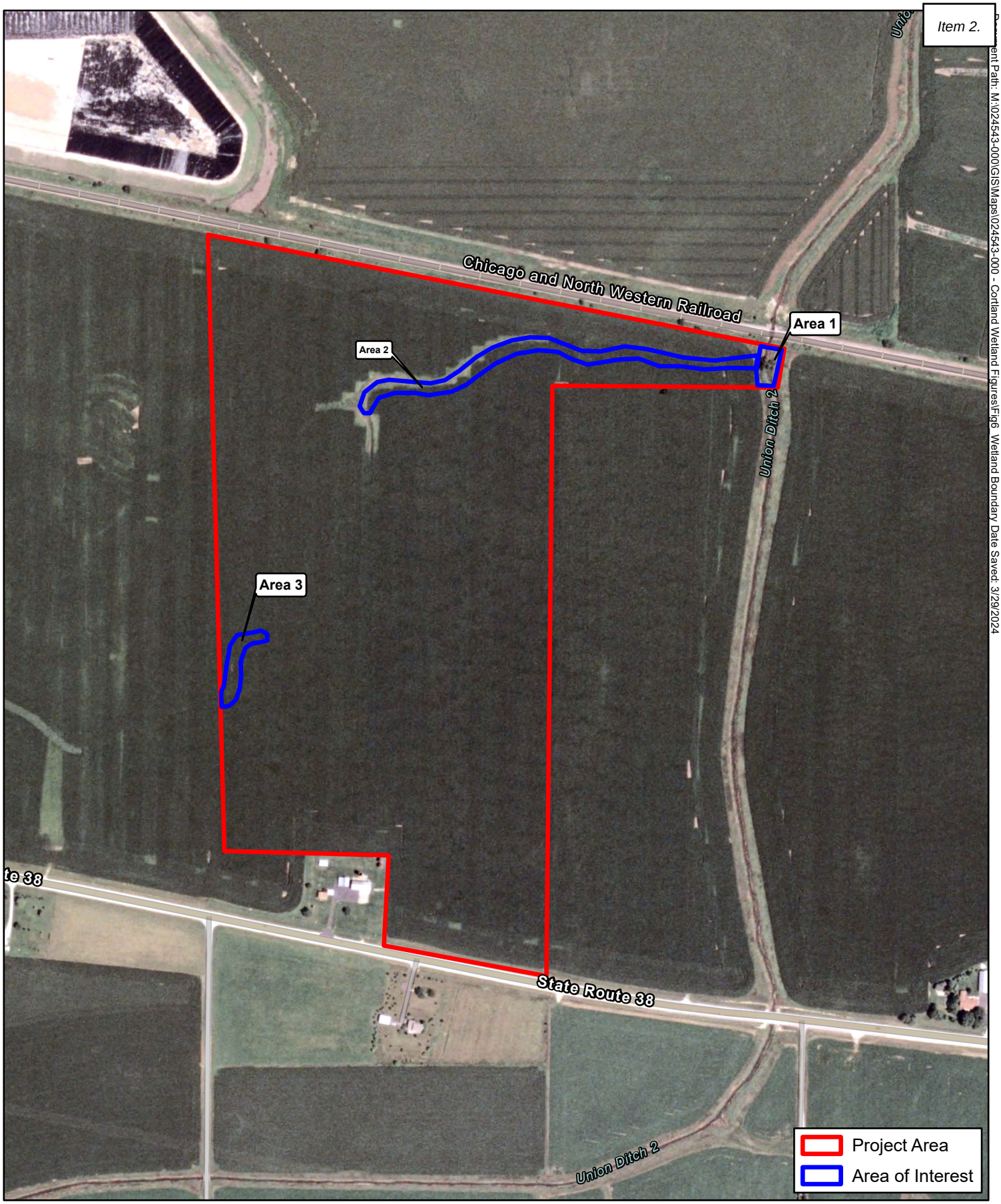
	Month	30% chance <	30% chance >	Precip	Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	May	3.29	5.47	3.46	N	2	3	6
2nd Prior Month*	April	2.91	5.28	6.01	W	3	2	6
3rd Prior Month*	March	2.10	4.08	6.78	W	3	1	3
							Sum	**15**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been wetter than normal**



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SOLARSTONE

Aerial Map - 2007

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2007
Photo/obs Date	6/1/2007	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

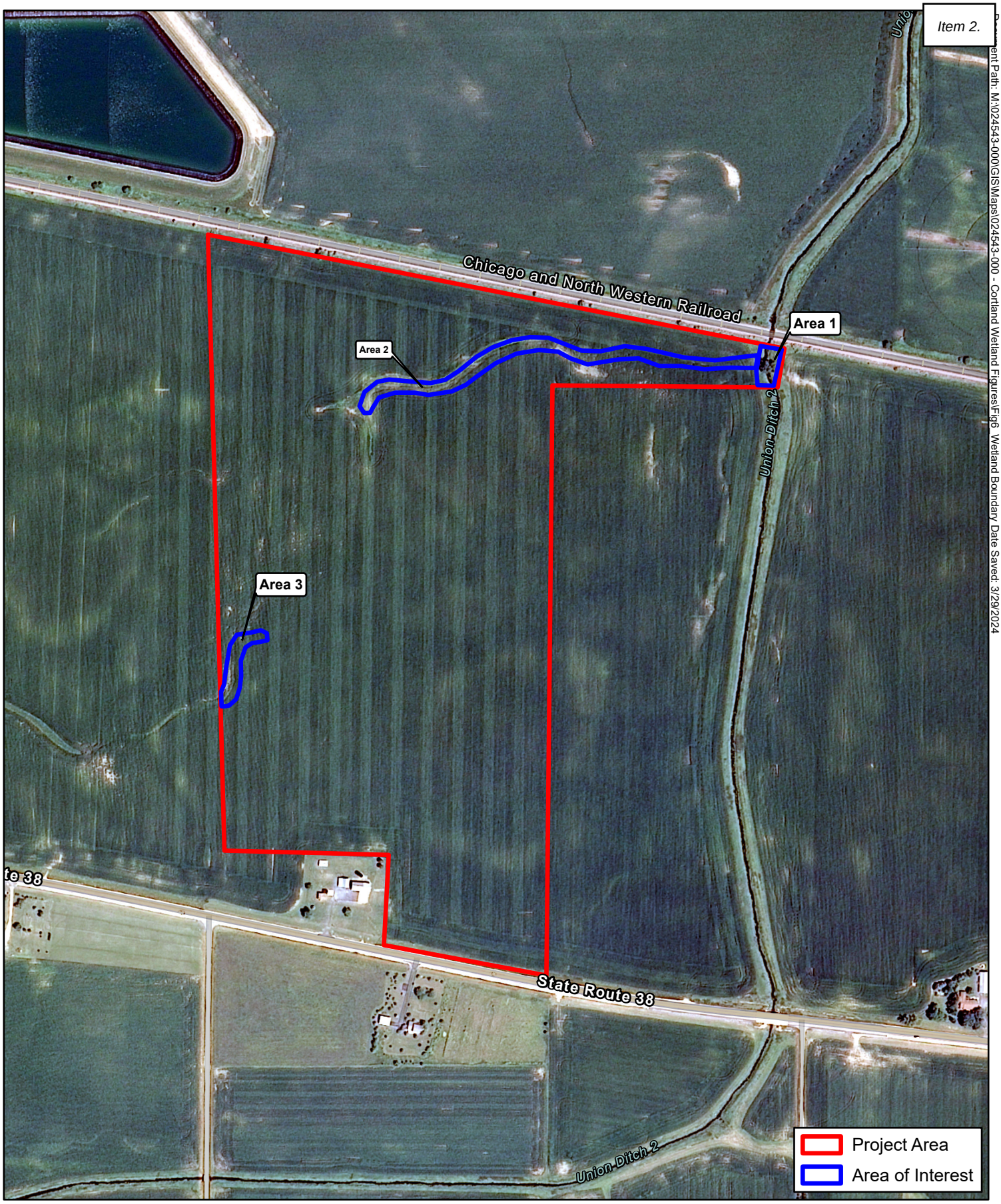
	Month	30% chance <	30% chance >	Precip	Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	May	3.29	5.47	2.26	D	1	3	3
2nd Prior Month*	April	2.91	5.28	3.52	N	2	2	4
3rd Prior Month*	March	2.10	4.08	3.55	N	2	1	2
							Sum	**9**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been drier than normal**



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SOLARSTONE

Aerial Map - 2010

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2010
Photo/obs Date	7/1/2010	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

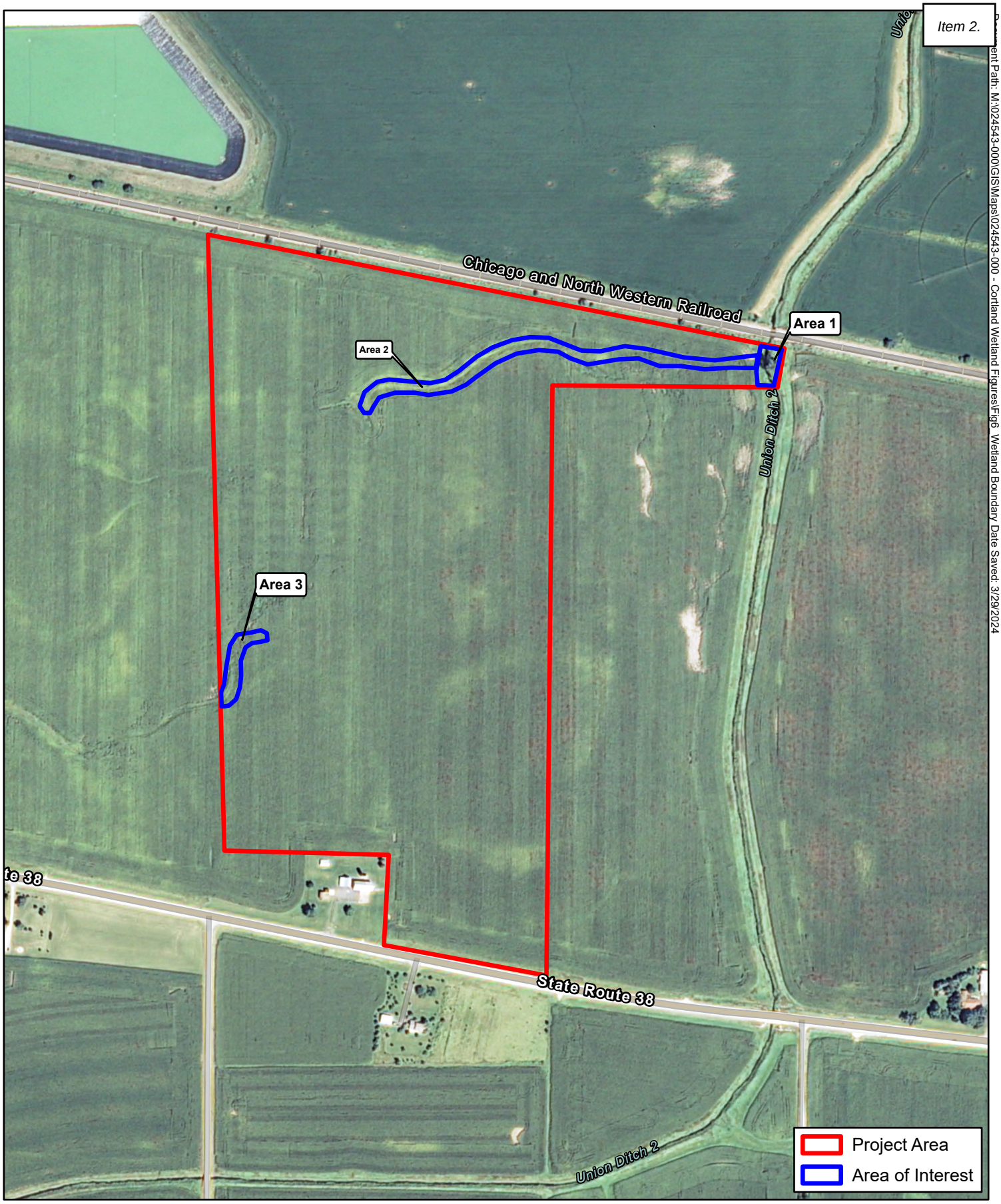
	Month	30% chance <	30% chance >	Precip	Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	June	2.77	5.53	6.53	W	3	3	9
2nd Prior Month*	May	3.28	5.87	5.67	N	2	2	4
3rd Prior Month*	April	2.56	4.17	3.46	N	2	1	2
							Sum	**15**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been wetter than normal**



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SOLARSTONE

Aerial Map - 2011

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2011
Photo/obs Date	9/1/2011	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

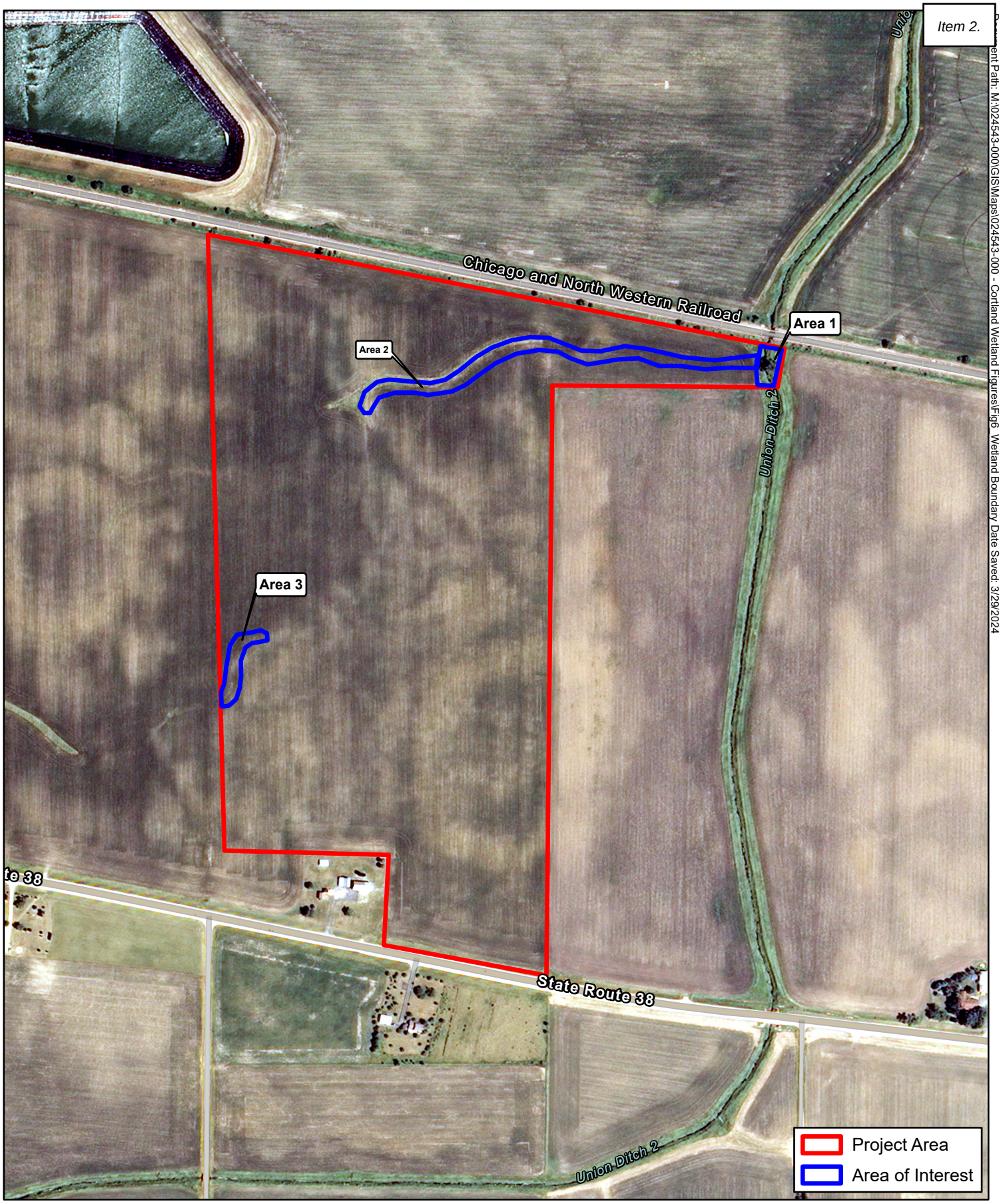
	Month	30% chance <	30% chance >	Precip	Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	August	2.69	4.84	5.29	W	3	3	9
2nd Prior Month*	July	2.49	4.80	5.28	W	3	2	6
3rd Prior Month*	June	2.77	5.53	4.53	N	2	1	2
							Sum	**17**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been wetter than normal**



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SOLARSTONE

Aerial Map - 2012

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2012
Photo/obs Date	7/1/2012	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

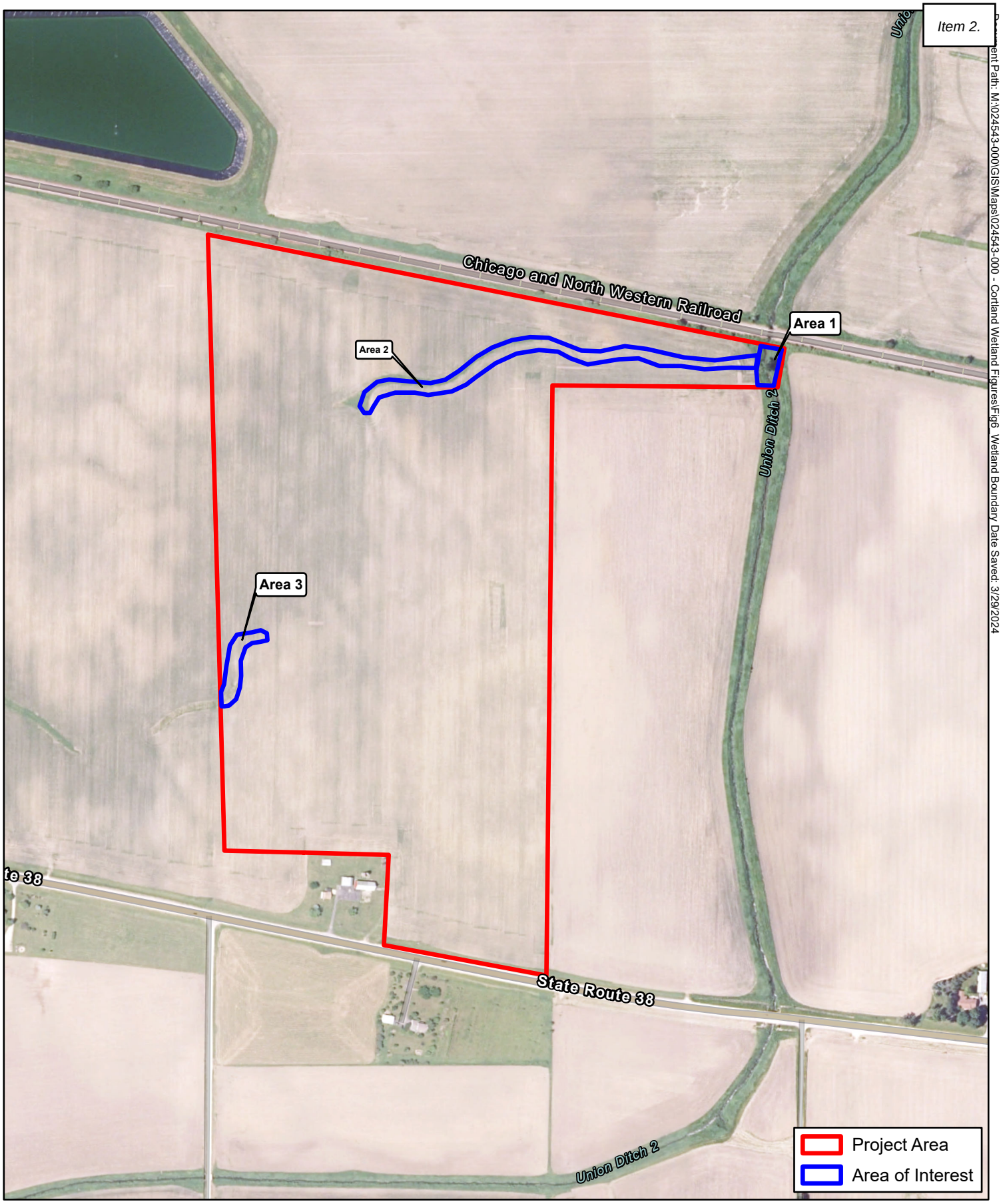
	Month	30% chance <	30% chance >	Precip	Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	June	2.77	5.53	2.16	D	1	3	3
2nd Prior Month*	May	3.28	5.87	1.26	D	1	2	2
3rd Prior Month*	April	2.56	4.17	2.96	N	2	1	2
							Sum	**7**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been drier than normal**



Aerial Map - 2014

SOLARSTONE

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

575

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NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2014
Photo/obs Date	6/1/2014	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

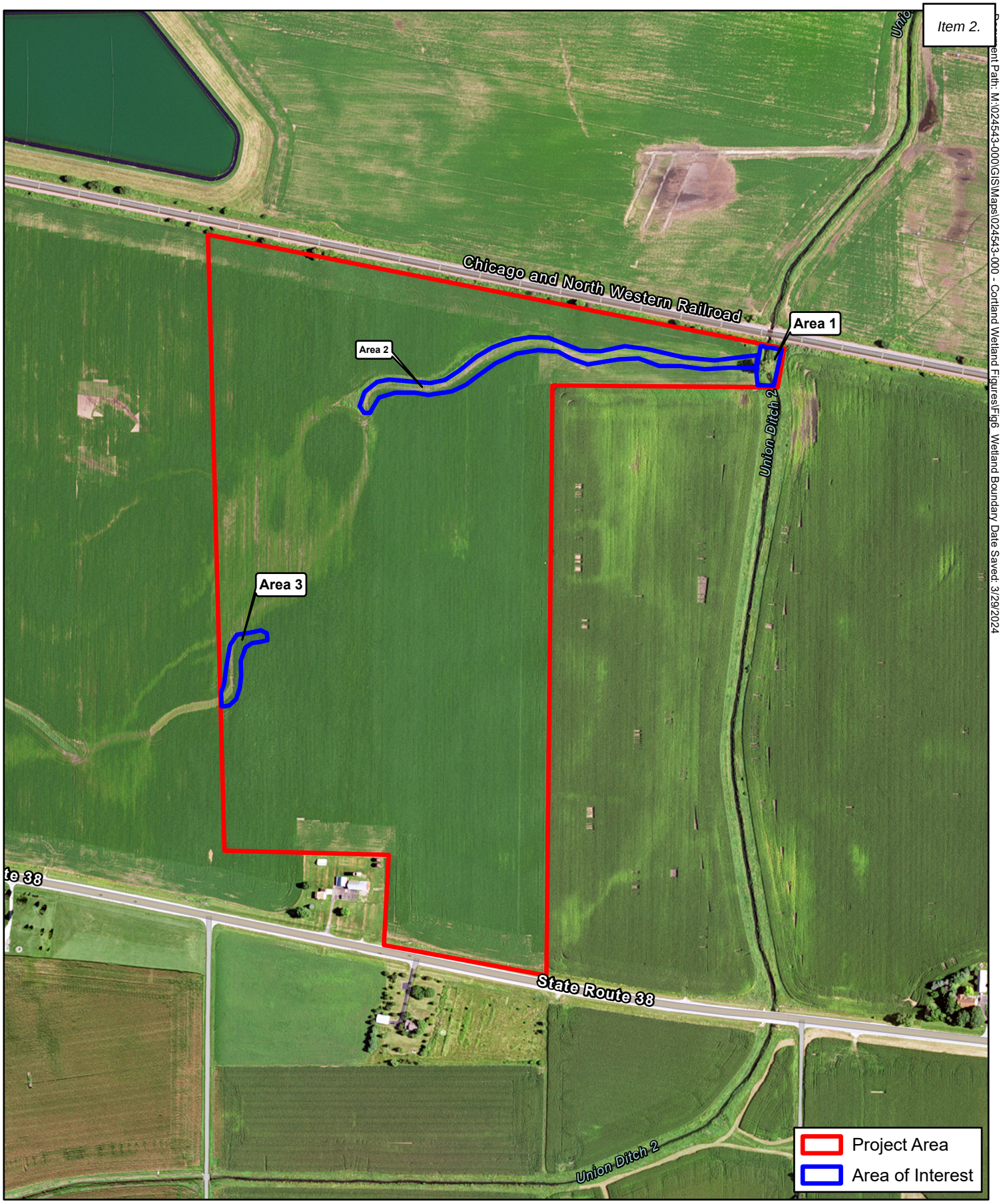
	Month	30% chance <	30% chance >	Precip	Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	May	3.28	5.87	3.01	D	1	3	3
2nd Prior Month*	April	2.56	4.17	2.75	N	2	2	4
3rd Prior Month*	March	1.45	2.69	0.80	D	1	1	1
							Sum	**8**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been drier than normal**



Aerial Map - 2015

Cortland Solar LLC
DeKalb County, IL

SOLARSTONE

N

0 500 Feet

1 inch = 500 feet

wsb

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NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2015
Photo/obs Date	8/1/2015	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

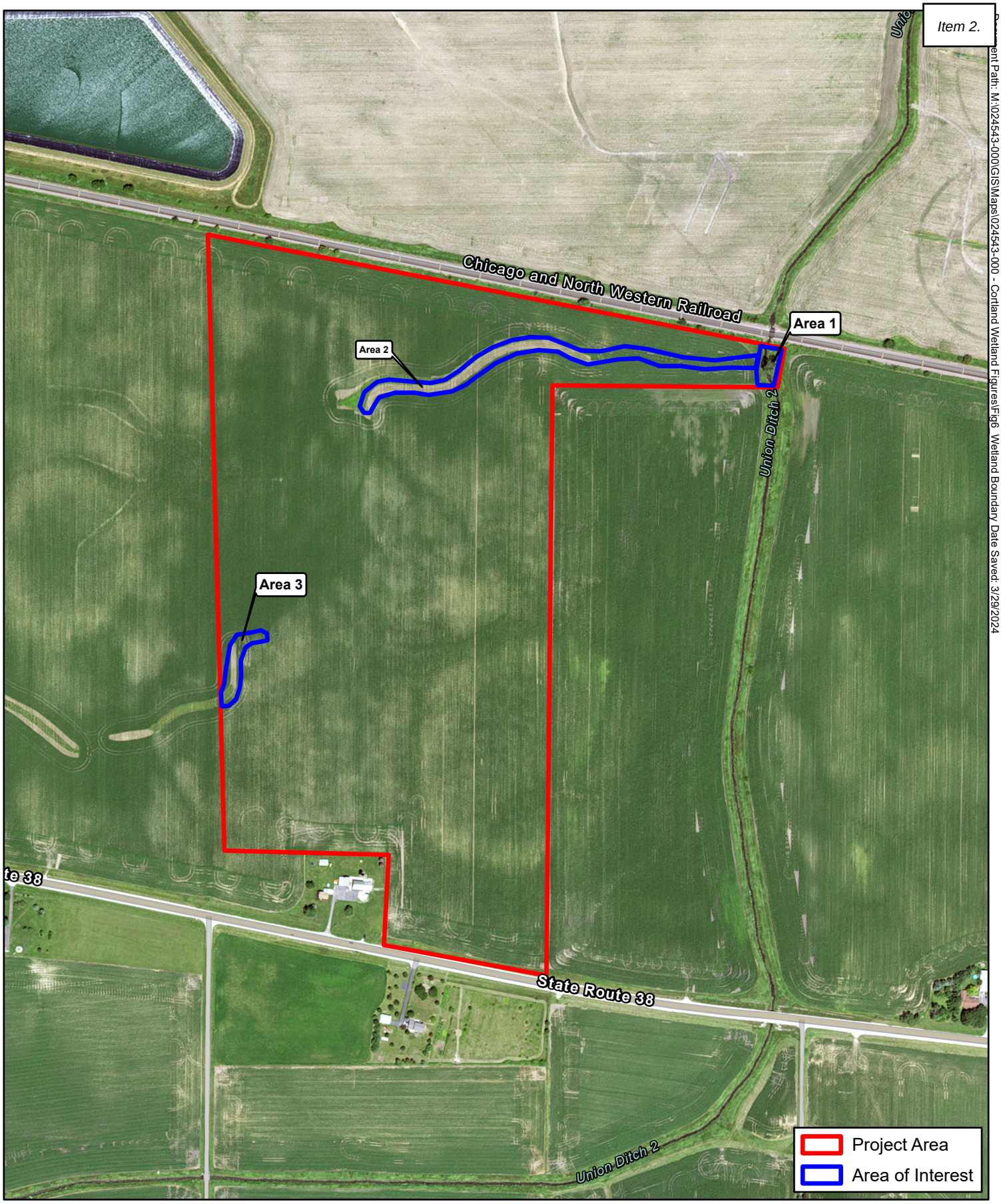
	Month	30% chance <	30% chance >	Precip	Condition **D**ry, **W**et, **N**ormal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	July	2.49	4.80	3.20	N	2	3	6
2nd Prior Month*	June	2.77	5.53	8.20	W	3	2	6
3rd Prior Month*	May	3.28	5.87	5.82	N	2	1	2
							Sum	**14**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been normal**



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SOLARSTONE

Aerial Map - 2017

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2017
Photo/obs Date	7/1/2017	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

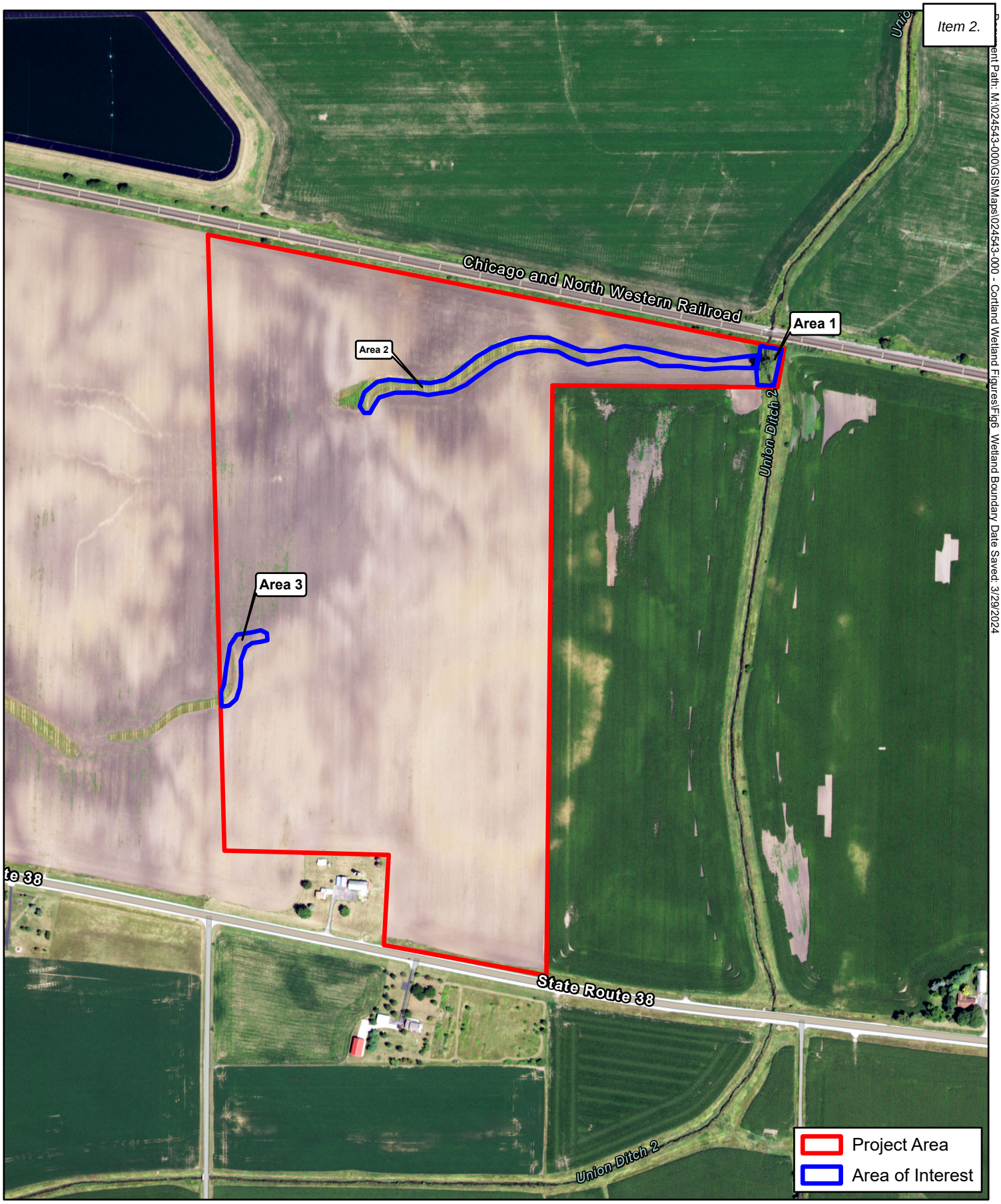
	Month	30% chance <	30% chance >	Precip	Condition **D**ry, **W**et, **N**ormal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	June	2.77	5.53	3.50	N	2	3	6
2nd Prior Month*	May	3.28	5.87	4.76	N	2	2	4
3rd Prior Month*	April	2.56	4.17	5.19	W	3	1	3
							Sum	**13**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been normal**



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SOLARSTONE

Aerial Map - 2019

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2019
Photo/obs Date	8/1/2019	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

	Month	30% chance <	30% chance >	Precip	Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	July	2.49	4.80	1.87	D	1	3	3
2nd Prior Month*	June	2.77	5.53	2.69	D	1	2	2
3rd Prior Month*	May	3.28	5.87	7.80	W	3	1	3
							Sum	**8**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been drier than normal**



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SOLARSTONE

Aerial Map - 2020

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2020
Photo/obs Date	7/1/2020	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

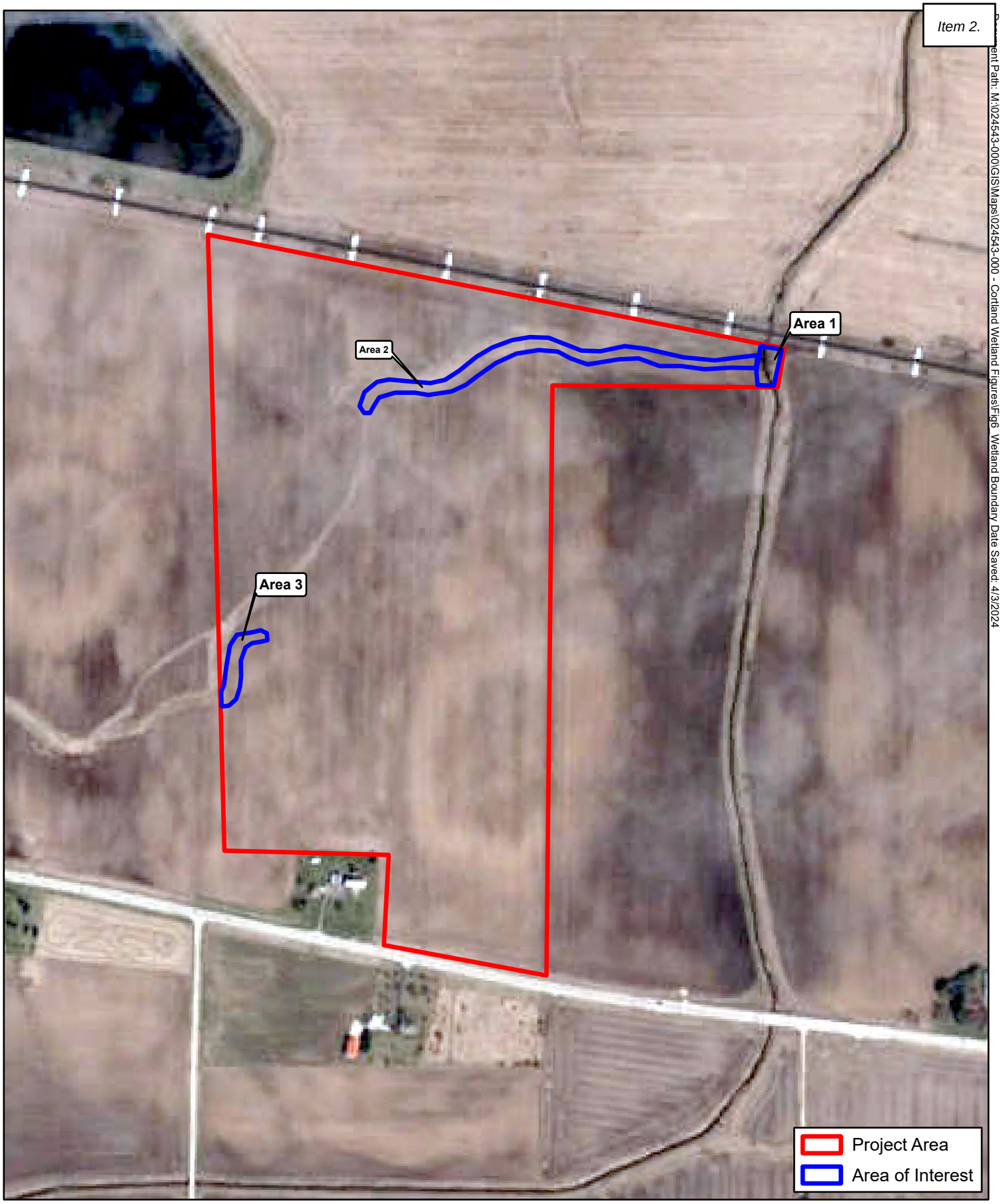
	Month	30% chance <	30% chance >	Precip	Condition Dry, Wet, Normal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	June	2.77	5.53	2.48	D	1	3	3
2nd Prior Month*	May	3.28	5.87	6.22	W	3	2	6
3rd Prior Month*	April	2.56	4.17	3.40	N	2	1	2
							Sum	**11**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been normal**



Aerial Map - 2021

Cortland Solar LLC
DeKalb County, IL

SOLARSTONE

N

0 500 Feet

1 inch = 500 feet

wsb

585

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NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2021
Photo/obs Date	4/1/2021	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

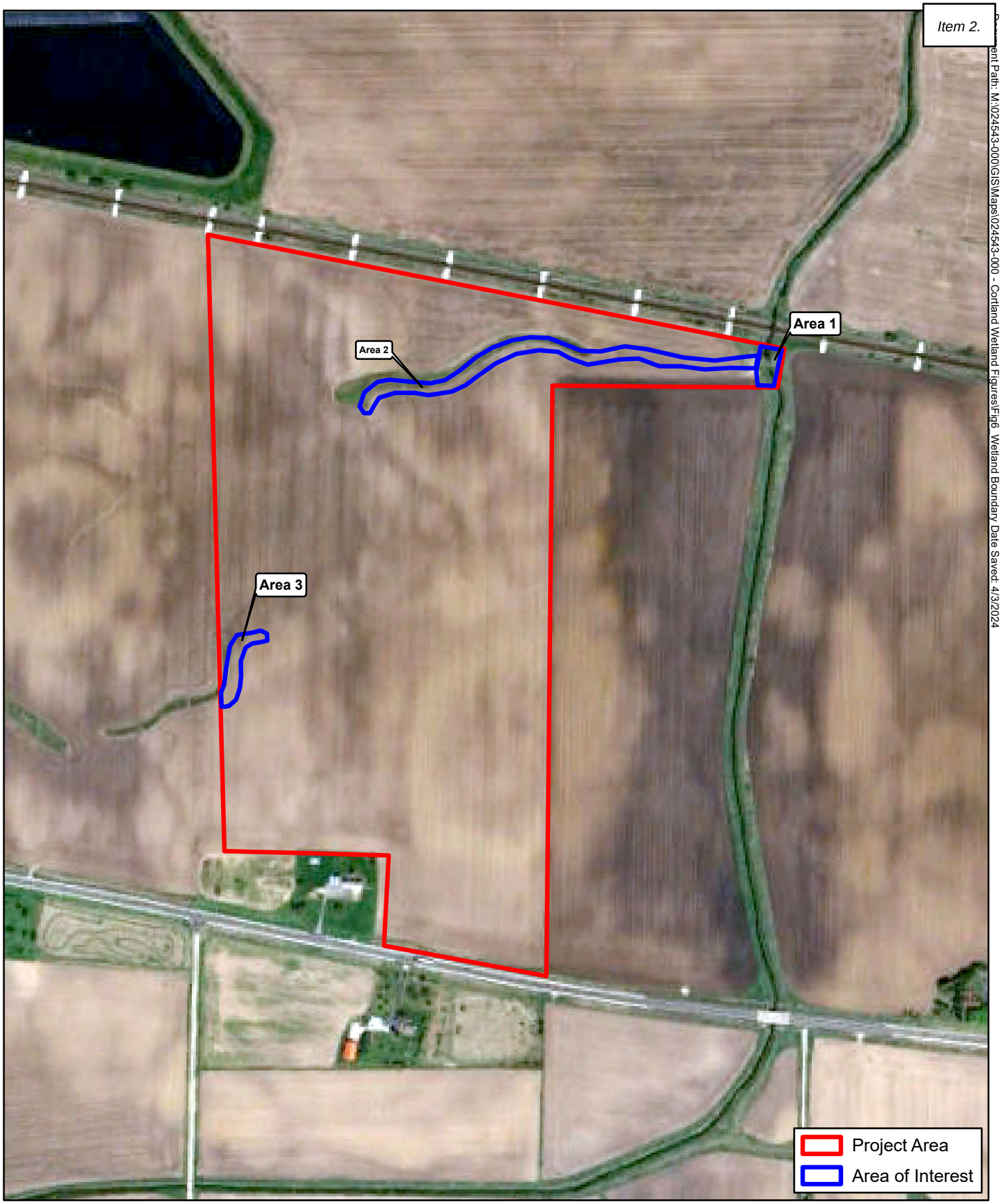
	Month	30% chance <	30% chance >	Precip	Condition **D**ry, **W**et, **N**ormal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	March	1.45	2.69	2.30	N	2	3	6
2nd Prior Month*	February	1.02	2.07	0.80	D	1	2	2
3rd Prior Month*	January	1.07	1.99	1.84	N	2	1	2
							Sum	**10**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been normal**



Aerial Map - 2023

Cortland Solar LLC
DeKalb County, IL

SOLARSTONE

N

0 500 Feet

1 inch = 500 feet

wsb

587

Document Path: M:\024543-000\GIS\Maps\024543-000 - Cortland Wetland Figures\Fig6 Wetland Boundary Date Saved: 4/3/2024

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	3/1/2024	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	2023
Photo/obs Date	5/1/2023	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

	Month	30% chance <	30% chance >	Precip	Condition **D**ry, **W**et, **N**ormal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	April	2.56	4.17	3.04	N	2	3	6
2nd Prior Month*	March	1.45	2.69	1.97	N	2	2	4
3rd Prior Month*	February	1.02	2.07	2.78	W	3	1	3
							Sum	**13**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been normal**

Appendix H: Level 2 Wetland Delineation Report

LEVEL 2 WETLAND DELINEATION REPORT

CORTLAND SOLAR

CORTLAND SOLAR LLC

DEKALB COUNTY, ILLINOIS

October 2025

Prepared for:
Cortland Solar LLC

WSB PROJECT NO. 24543

LEVEL 2 WETLAND DELINEATION REPORT

Cortland Solar LLC

October 15, 2025

Prepared by:

CERTIFICATION

The report was prepared by:



Shawn Williams, CMWP No.1178

Date: October 15, 2025 Title: Senior Environmental Scientist

I hereby certify that this report was reviewed by me and that I am a Certified Wetland Delineator in the State of Minnesota.



Alison Harwood, CMWP No.1238

Date: October 15, 2025 Title: Director of Natural Resources

TABLE OF CONTENTS

TITLE PAGE
CERTIFICATION
TABLE OF CONTENTS

I. Introduction 1
A. Project Location 1
B. Project Purpose 1
C. Project Scope 1
D. Summary of Findings 1
II. Delineation Procedure 2
A. Off-Site Determination: Base Map Review 2
B. On-Site Determination 3
III. Results and Wetland Information 4
A. Wetland 1 4
B. Additional Sampled Areas 4
C. Additional Water Resources 4
IV. Summary and Closing Statements 5
V. References 6

Appendix A:
Figure 1 – Project Location
Figure 2 – Topography
Figure 3 – National Hydrography Dataset (NHD) and Floodplain
Figure 4 – National Wetlands Inventory
Figure 5 – County Soil Survey

Appendix B:
Figure 6 – Wetland Delineation
Wetland Determination Data Forms

Appendix C: Wetland Photos

Appendix D: Antecedent Precipitation Data

SECTION I

I. Introduction

A. Project Location

The project is located in Cortland Township, DeKalb County, IL. The site is located northeast of the intersection of State Highway 38 and Chase Road. The project area consists of approximately 81 acres in Section 27 of Township 40N and Range 5E. (**Figure 1, Appendix A**).

B. Project Purpose

Cortland Solar LLC is evaluating the site for a potential future solar energy development. This report is intended to address all Section 404 jurisdictional wetlands and/or waters for final design and permitting of this project. This project was authorized by Cortland Solar LLC.

C. Project Scope

The scope of this project was to delineate all water resources within the outlined project area.

D. Summary of Findings

A Level 2 wetland delineation was performed on the site. One (1) wetland and one ditched watercourse were identified and delineated in the preparation of this report, as summarized in **Table 1**. For a visual representation of the wetland locations and size, please see **Figure 6**, **Appendix B**. All potential wetland areas (mapped hydric soils, NWI signatures, and low depressional areas) were reviewed on-site and either delineated or determined to be upland.

Table 1: Summary of Delineated Wetlands, Cortland Solar LLC, DeKalb County, Illinois

Wetland ID	Delineation Method	No. Flags/ No. Transects	Wetland Classification	Circular 39 (Cowardin)	NWI	IDNR PWI	County Soil Survey (Hydric/Non-Hydric)	Wetland Size (acres)
1	1/2	8/1	Seasonally Saturated (farmed)	Type 1 (PEM1Af)	No	No	**152A**	0.04

SECTION II

II. Delineation Procedure

A. Off-Site Determination: Base Map Review

Offsite Wetland Hydrology Assessment (Level 1 Wetland Delineation): Prior to the onsite Level 2 wetland delineation, WSB completed a Level 1 wetland delineation of the property to determine whether wetland hydrology exists within the site.

Based on the Level 1 delineation, three potential wetland areas were identified. One area (Area 1) was concluded to be Union Ditch No. 2, a ditched watercourse. Area 2 and Area 3 required field verification to confirm whether wetland hydrology exists. A portion of Area 2 met wetland criteria and was field-delineated as Wetland 1. A sample point was taken at Area 3 but determined to be upland because hydric soil indicators were not observed. All three areas were investigated as described in this Level 2 wetland delineation report.

Topography: The landform of the site consists of a gentle sloping upland field that leads down to Union Ditch 2, to the east of the parcel. Water flows from west to east, generally (**Figure 2, Appendix A**).

The *National Hydrography Dataset (NHD)* depicts one tributary (Union Ditch No. 2) within the site. The tributary is located at the northeast corner of the parcel. The *FEMA Flood Map* depicts Zone A within the northeast corner of the site (**Figure 3, Appendix A**). It is associated with Union Ditch No. 2.

The *National Wetlands Inventory Map* (US Fish and Wildlife Service) depicts one tributary (Union Ditch No. 2) within the site (**Figure 4, Appendix A**).

The *Soil Survey of DeKalb County, Illinois* (https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm) identified the following soils (**Table 2**) within the project area (**Figure 5, Appendix A**):

Table 2: Soil Survey

Map Symbol	Soil Unit Name	Percent Hydric	Rating
104A	Virgil silt loam, 0 to 2 percent slopes	10	Predominantly Non-Hydric
152A	Drummer silty clay loam, 0 to 2 percent slopes	100	All Hydric
154A	Flanagan silt loam, 0 to 2 percent slopes	4	Predominantly Non-Hydric
171B	Catlin silt loam, 2 to 5 percent slopes	0	Not Hydric
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded	4	Predominantly Non-Hydric
512B	Danabrook silt loam, 2 to 5 percent slopes	8	Predominantly Non-Hydric
667A	Kaneville silt loam, 0 to 2 percent slopes	8	Predominantly Non-Hydric
667B	Kaneville silt loam, 2 to 5 percent slopes	0	Not Hydric

Antecedent Climate Conditions: Historic climate data and WETS data were obtained from the AgACIS precipitation data tool preceding the September 17, 2024 site visit, which fell within the normal precipitation range. Records of the precipitation can be found in **Appendix D**.

B. On-Site Determination

A Level 2 field investigation was conducted by Shawn Williams (Certified Minnesota Wetland Professional - CMWP No. 1178) of WSB on September 17, 2024 within the project area. No deviation or omissions were undertaken as part of this investigation.

The project area was delineated using the routine methodology described in the *Corps of Engineers Wetlands Delineation Manual* (US Army Corps of Engineers 1987), with additional guidance provided by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0).* Wetlands were classified according to the methodologies set forth in *Wetlands of the United States (Circular 39),* USFWS Shaw and Fredine 1971; *Classification of Wetlands and Deepwater Habitats of the United States*, Cowardin 1979; and *Illinois Wetlands (IDNR).* The wetland types in this report are classified by the Circular 39, Cowardin, and IDNR Classifications.

Soil types were researched prior to the on-site investigation with the assistance of the *Soil Survey of DeKalb County* from the National Resources Conservation Service. All soil test pits were excavated to a minimum depth of 24 inches unless otherwise noted. Soil colors were described on-site per the *Munsell Soil Color Charts* (2009 Revised Edition) from the test pits in and adjacent to the wetlands. Hydric soils were identified using the current technical criteria for hydric soils developed by the NRCS in 2024 (Version 9.0). A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. The presence of water was observed after time was allowed for movement of water through the substrate. This time varied depending upon soil characteristics.

The quadrant sampling method was employed for all sample points unless otherwise noted. Vegetation was measured as actual areal cover and may exceed 100 percent of total area due to overlap. Grasses and herbaceous vegetative cover were measured within a circular plot of a 5-foot-radius, all woody shrubs and saplings were measured within a circular plot with a 15-foot-radius, and trees and woody vines were measured in a 30-foot-radius circular plot. Regional plant identification resources were utilized in the identification of plant species, with indicator status taken from the *2022 National Wetland Plant List* (US Army Corps of Engineers 2022). Plant species dominance was estimated based on the absolute percent coverage for herbaceous, shrub-sapling, and tree strata if present. In addition to the use of indicators of hydrology, hydric soils, and the presence of hydrophytic vegetation, other evidence such as topographic breaks and watershed characteristics were used to determine the wetland boundary.

Midwest Regional Supplement Routine Wetland Delineation data forms were used to record vegetation, hydrology, and soil characteristics at sample points in and adjacent to the wetland (**Appendix B**). Sampling transects were taken along the wetland-upland boundary of the wetland. Transects and delineated wetland boundaries were field surveyed using a sub-meter accuracy hand-held GPS unit. Approximate sampling points and delineated wetland edges are shown on **Figure 6, Appendix B**. Pictures of each wetland can be found in **Appendix C**.

SECTION III

III. Results and Wetland Information

The wetland delineation data forms (**Appendix B**) and photos (**Appendix C**) are attached. A summary of the delineation is below.

A. Wetland 1

Circular 39: Type 1
Cowardin: PEM1Af
Classification: Seasonally Saturated
Soil mapping unit: Drummer silty clay loam, 0 to 2 percent slopes (152A)
No. Transects: 1 **No. Additional Sample Points:** 0
Wetland Flags: 8
Wetland Size (within Project Area): 0.04 acre
Anticipated USACE Jurisdiction: Likely because of surface hydric soil connection with Union Ditch No. 2.

Wetland 1 is positioned in a sloped depression that has been historically disturbed by agricultural land use. The wetland is characterized as Type 1 seasonally saturated – farmed. The wetland boundary is outlined in **Figure 6, Appendix B**.

Dominant vegetation in the wetland consisted of yellow foxtail (*Setaria pumila*), yellow nutsedge (*Cyperus esculentus*), and marsh milkweed (*Asclepias incarnata*) in the herb stratum. Hydric soil indicators consisted of Depleted Matrix (F3). Hydrology indicators included Drainage Patterns (B10), Saturation Visible on Aerial Imagery (C9), Geomorphic Position (D2), and FAC-Neutral Test (D5).

Dominant vegetation in the upland consisted of nodding fescue (*Festuca subverticillata*) and soybean (*Glycine max*) in the herb stratum. Hydric soil indicators included Depleted Matrix (F3). No wetland hydrology indicators were observed. Soybean fields exist in the surrounding upland.

The wetland boundary was placed along a slight topographic break where wetland hydrology was no longer observed and the hydrophytic vegetation diminished.

B. Additional Sampled Areas

Two additional sample points were taken. Sample point 2 Up was located in a sloped flat area near the west property boundary, which corresponds to Area 3 of the Level 1 delineation. 2Up is effectively drained and does not retain wetland hydrology.

Sample Point 3 Up was also effectively drained by nearby Union Ditch No.2, and did not have hydrophytic vegetation or wetland hydrology.

C. Additional Water Resources

Union Ditch No. 2 extends through the very northeast portion of the site. It conveys water from south to north. Union Ditch No. 2 is a tributary to the South Branch of the Kishwaukee River, which is located 1.6 miles northeast of the site.

SECTION IV

IV. Summary and Closing Statements

One (1) wetland was delineated within the project area using the Level 2 method. One named tributary, Union Ditch No. 2, extends through the northeast part of the site.

The wetland delineation report was completed by Shawn Williams of WSB. This delineation report is being submitted as a request for approval of Wetland Type and Boundary of the wetlands described herein.

SECTION V

V. References

The following sources of information were reviewed to assist in performing the wetland delineation.

Literature Sources

Cowardin L.M. USFWS. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Government Printing Office, Carver, D.C. 131 pp.

Fredine, C.G. and S.P. Shaw. 1956. Wetlands of the United States (Circular 39). United States Government Printing Office, Carver, D.C.

Kollmorgen Instruments Corp. 2009 Revised Edition. Munsell Soil Color Charts.

United States Army Corps of Engineers. (2023). 2022 National Wetland Plant List, version 3.6. U.S. Army Engineer Research and Development Center, Vicksburg, MS. http://wetland-plants.usace.army.mil/

United States Army Corps of Engineers. August 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Nobel. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

United States Army Corps of Engineers. 1987. 2014. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Version 2.0 Waterways Experiment Station.

United States Department of Agriculture, Natural Resources Conservation Service. 2024. Field Indicators of Hydric Soils in the United States, Version 9.0.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Webs Soil Survey, Illinois. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed September 16, 2024

APPENDIX

APPENDIX A

Figure 1: Project Location
Figure 2: Topography
Figure 3: National Hydrography Dataset and Floodplain
Figure 4: National Wetlands Inventory
Figure 5: County Soil Survey

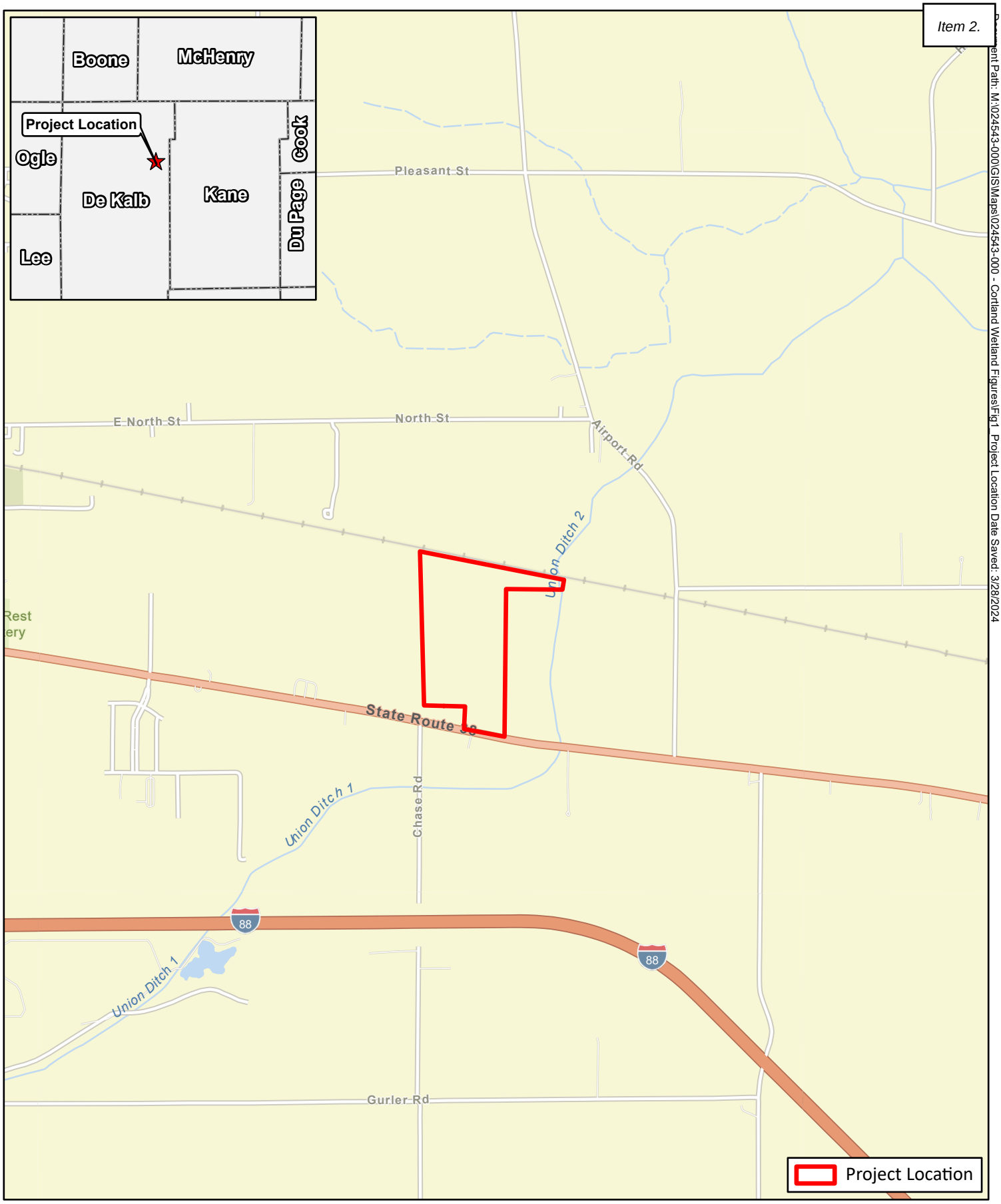


Figure 1 - Project Location

Cortland Solar LLC
DeKalb County, IL

SOLARSTONE

N

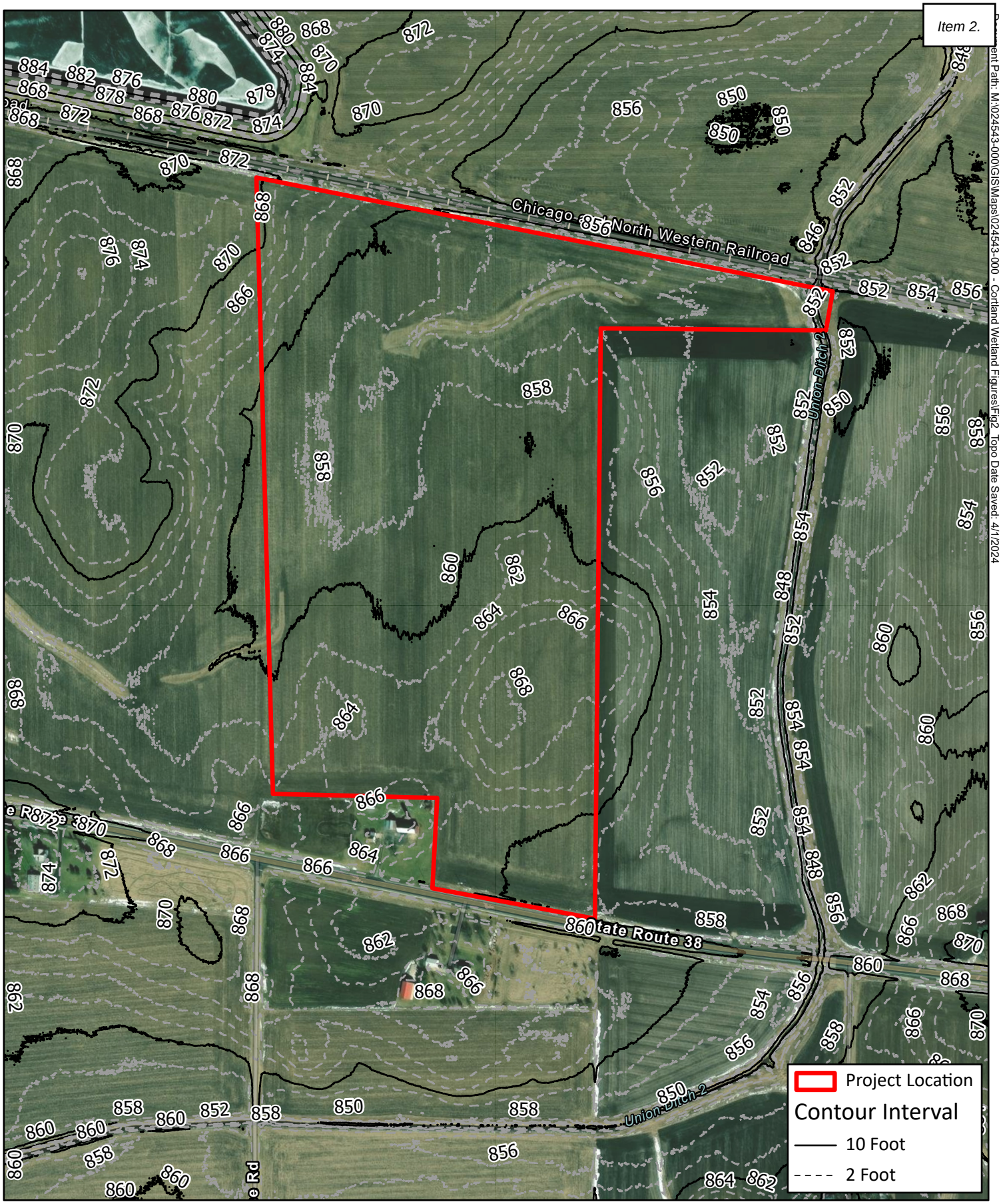
0 2,000 Feet

1 inch = 2,000 feet

wsb

601

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SOLARSTONE

Figure 2 - Topography

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

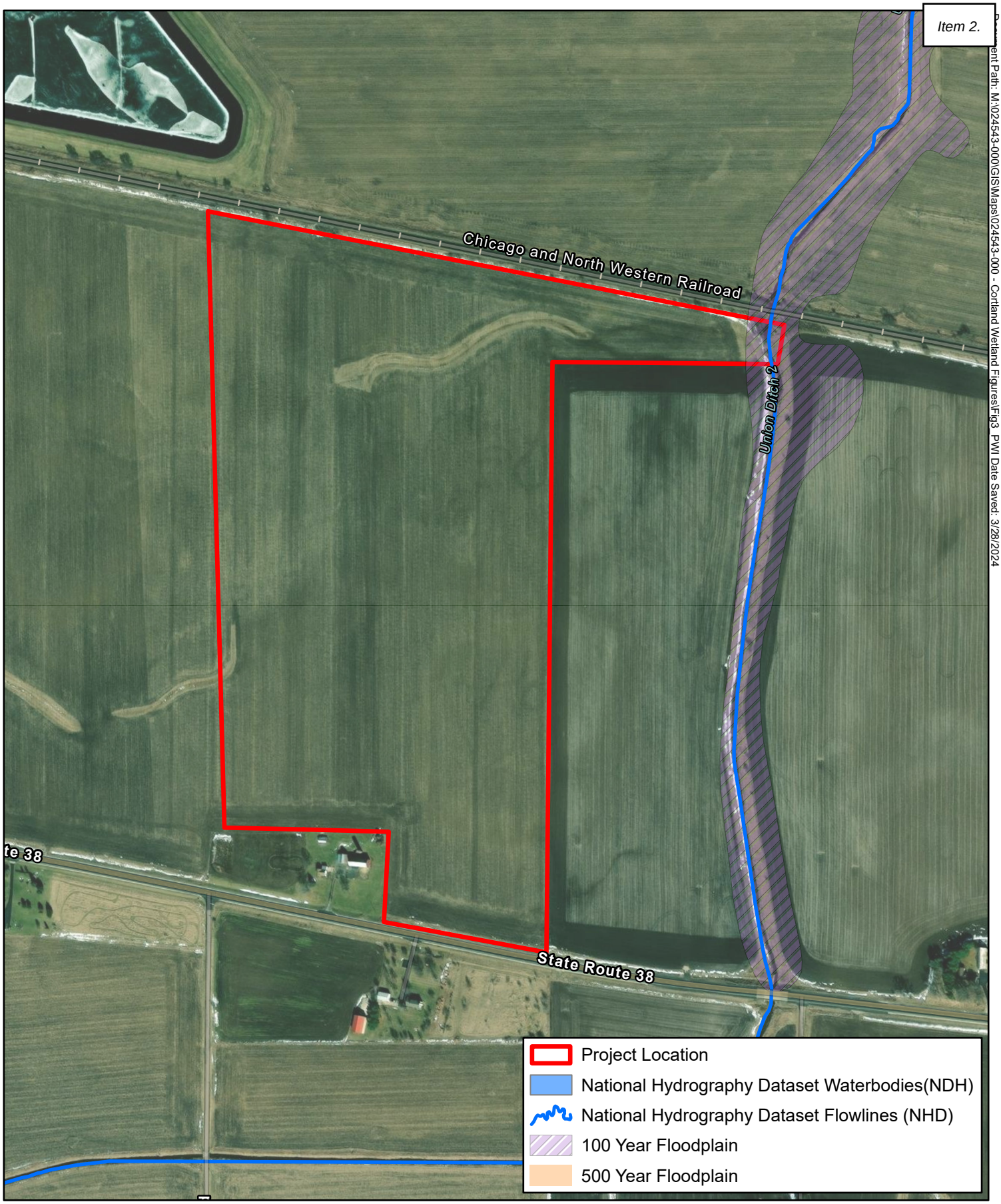


Figure 3 - National Hydrography Dataset (NHD) and Floodplain

SOLARSTONE

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet
1 inch = 500 feet

WSP

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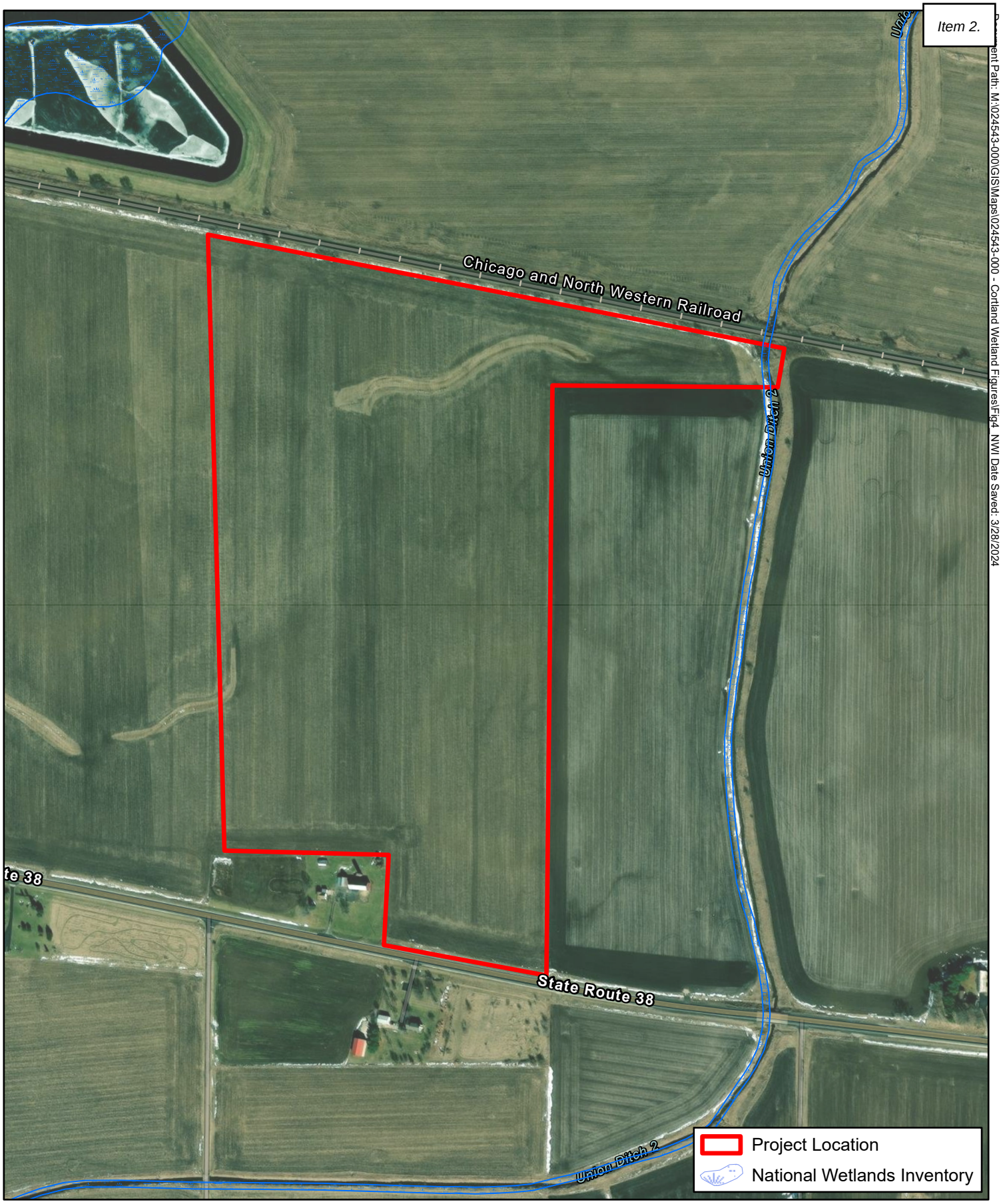


Figure 4 - National Wetlands Inventory

SOLARSTONE

Cortland Solar LLC
DeKalb County, IL

N

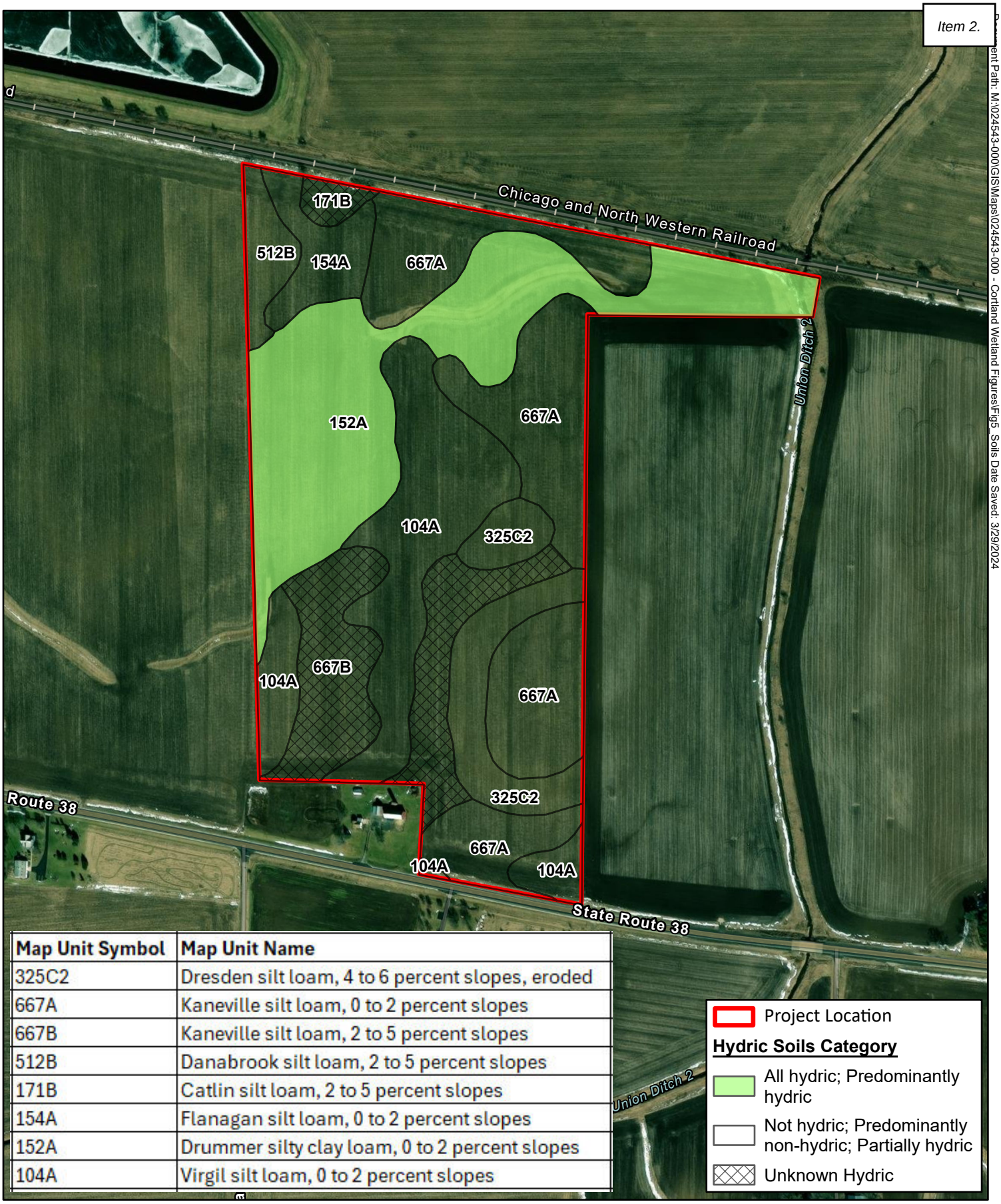
0 500 Feet

1 inch = 500 feet

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604

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Map Unit Symbol	Map Unit Name
325C2	Dresden silt loam, 4 to 6 percent slopes, eroded
667A	Kaneville silt loam, 0 to 2 percent slopes
667B	Kaneville silt loam, 2 to 5 percent slopes
512B	Danabrook silt loam, 2 to 5 percent slopes
171B	Catlin silt loam, 2 to 5 percent slopes
154A	Flanagan silt loam, 0 to 2 percent slopes
152A	Drummer silty clay loam, 0 to 2 percent slopes
104A	Virgil silt loam, 0 to 2 percent slopes

SOLARSTONE

Figure 5 - County Soil Survey

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

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APPENDIX

APPENDIX B

Figure 6: Wetland Delineation
Wetland Determination Data Forms

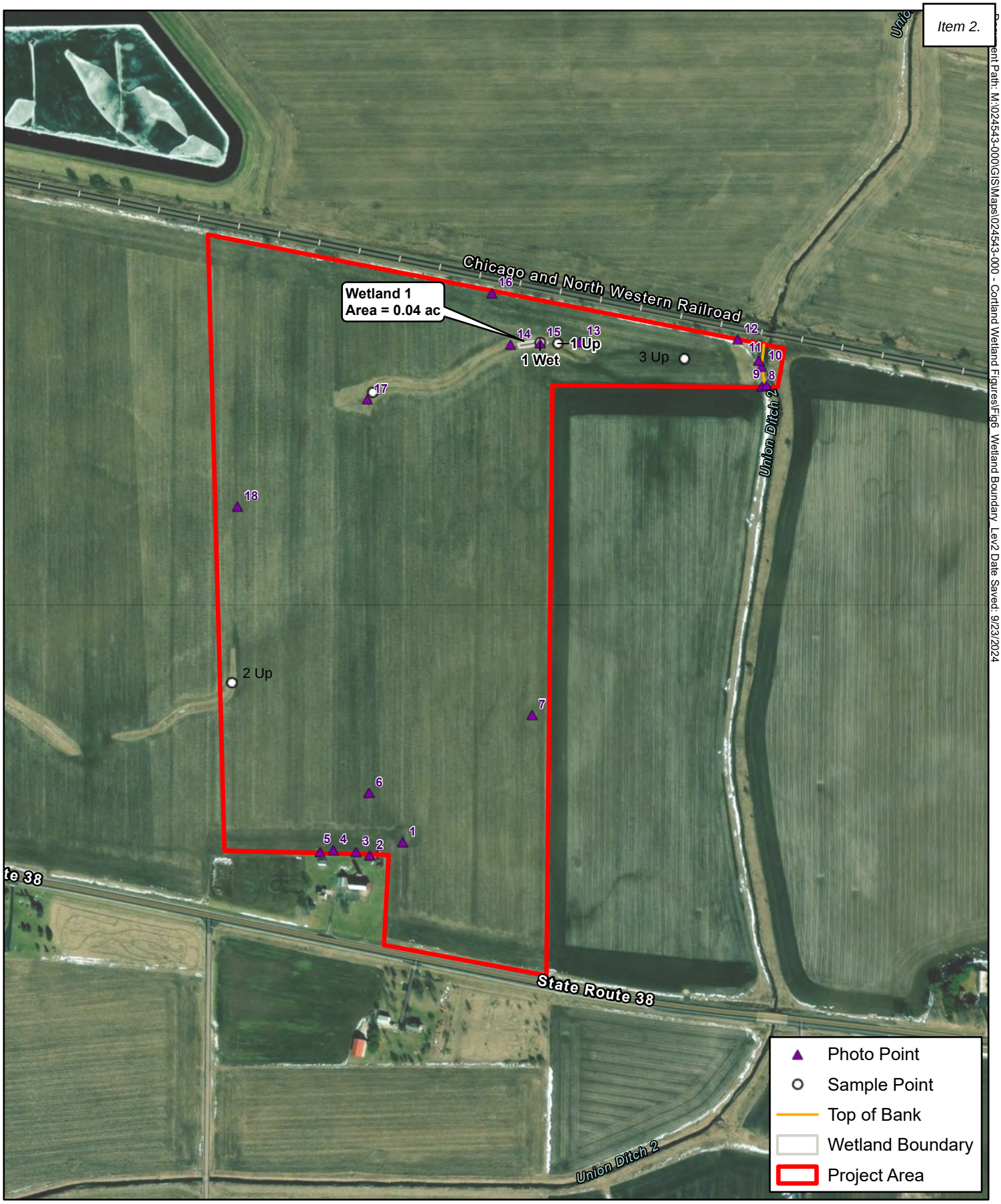


Figure 6 - Wetland Delineation

SOLARSTONE

Cortland Solar LLC
DeKalb County, IL

N

0 500 Feet

1 inch = 500 feet

wsb

607

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WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Cortland Solar LLC | City/County: DeKalb County | Sampling Date: 9/17/2024
Applicant/Owner: Cortland Solar LLC | State: IL | Sampling Point: 1 Wet
Investigator(s): WSB (Shawn Williams) | Section, Township, Range: Sec. 27, T40N, R5E
Landform (hillslope, terrace, etc.): depression | Local relief (concave, convex, none): concave
Slope (%): 3 | Lat: 41.915451 | Long: -88.656082 | Datum: WGS 84
Soil Map Unit Name: Drummer silty clay loam , 0-2 percent slopes (152A) | NWI Classification:
Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
Are vegetation X, soil X, or hydrology ___ significantly disturbed? Are "normal circumstances"
Are vegetation ___, soil ___, or hydrology ___ naturally problematic? present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

Soil and vegetation disturbed by agricultural land use.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratur (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 *Setaria pumila*	50	Y	FAC
2 *Cyperus esculentus*	35	Y	FACW
3 *Asclepias incarnata*	2	N	OBL
4			
5			
6			
7			
8			
9			
10			
	87	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

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: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	2	x 1 =	2
FACW species	35	x 2 =	70
FAC species	50	x 3 =	150
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	87 (A)		222 (B)

Prevalence Index = B/A = 2.55

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: 1 We

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-8	10Y 2/1	100					silty clay loam	
8-14	10YR 4/1	90	10YR 4/6	10	C	M	silty clay loam	
14-24	10YR 5/1	95	10YR 4/6	5	C	M	silty clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Cortland Solar LLC | City/County: DeKalb County | Sampling Date: 9/17/2024
Applicant/Owner: Cortland Solar LLC | State: IL | Sampling Point: 1 Up
Investigator(s): WSB (Shawn Williams) | Section, Township, Range: Sec. 27, T40N, R5E
Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none
Slope (%): 2 | Lat: 41.915451 | Long: -88.656082 | Datum: WGS 84
Soil Map Unit Name: Drummer silty clay loam , 0-2 percent slopes (152A) | NWI Classification:
Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
Are vegetation X, soil X, or hydrology ___ significantly disturbed? Are "normal circumstances"
Are vegetation ___, soil ___, or hydrology ___ naturally problematic? present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Soil and vegetation disturbed by agricultural land use.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		

Sapling/Shrub stratur (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		

Herb stratum (Plot size: 5' radius)			
1 *Festuca subverticillata*	90	Y	FACU
2			
3			
4			
5			
6			
7			
8			
9			
10			
	90 = Total Cover		

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across all Strata: 1 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	90	x 4 =	360	
UPL species	0	x 5 =	0	
Column totals	90	(A)	360	(B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation
___ Dominance test is >50%
___ Prevalence index is ≤3.0*
___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** 1 Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-8	10Y 2/1	100					silty clay loam	
8-14	10YR 3/1	90	10YR 4/6	10	C	M	silty clay loam	
							silty clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes ___	No X	Depth (inches): ___		
Water table present?	Yes ___	No X	Depth (inches): ___		
Saturation present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___		

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Cortland Solar LLC | City/County: DeKalb County | Sampling Date: 9/17/2024
Applicant/Owner: Cortland Solar LLC | State: IL | Sampling Point: 2 Up
Investigator(s): WSB (Shawn Williams) | Section, Township, Range: Sec. 27, T40N, R5E
Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none
Slope (%): 1 | Lat: 41.912001 | Long: -88.659502 | Datum: WGS 84
Soil Map Unit Name: Drummer silty clay loam , 0-2 percent slopes (152A) | NWI Classification:
Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
Are vegetation X, soil X, or hydrology ___ significantly disturbed? Are "normal circumstances"
Are vegetation ___, soil ___, or hydrology ___ naturally problematic? present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Soil and vegetation disturbed by agricultural land use.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratur (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5' radius)			
1 *Festuca subverticillata*	90	Y	FACU
2 *Bromus inermis*	10	N	FACU
3			
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across all Strata: 1 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	100	x 4 =	400	
UPL species	0	x 5 =	0	
Column totals	100	(A)	400	(B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

SOIL **Sampling Point:** 2 Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-7	10YR 3/2	100					silty clay loam	
7-15	10YR 3/1	60	10YR 4/6	20	C	M	silty clay loam	
	10YR 4/1	20					silty clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes ___	No X	Depth (inches): ___		
Water table present?	Yes ___	No X	Depth (inches): ___		
Saturation present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___		

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Cortland Solar LLC | City/County: DeKalb County | Sampling Date: 9/17/2024
Applicant/Owner: Cortland Solar LLC | State: IL | Sampling Point: 3 Up
Investigator(s): WSB (Shawn Williams) | Section, Township, Range: Sec. 27, T40N, R5E
Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none
Slope (%): 1 | Lat: 41.915495 | Long: -88.652972 | Datum: WGS 84
Soil Map Unit Name: Drummer silty clay loam , 0-2 percent slopes (152A) | NWI Classification:
Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)
Are vegetation X, soil X, or hydrology ___ significantly disturbed? Are "normal circumstances"
Are vegetation ___, soil ___, or hydrology ___ naturally problematic? present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

Soil and vegetation disturbed by agricultural land use.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0 = Total Cover		

Sapling/Shrub stratur (Plot size: 15' radius)			
1			
2			
3			
4			
5			
	0 = Total Cover		

Herb stratum (Plot size: 5' radius)			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
	0 = Total Cover		

Woody vine stratum (Plot size: 30' radius)			
1			
2			
	0 = Total Cover		

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across all Strata: 0 (B)
Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	0	(A)	0	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

soybean stubble

SOIL

Sampling Point: 3 Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
0-9	10YR 3/1	100					silty clay loam	
9-17	10YR 4/1	95	10YR 4/6	5	C	M	silty clay loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is 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)
- ___ Inundation Visible on Aerial Imagery (B7)
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- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes ___	No	X	Depth (inches):	___
Water table present?	Yes ___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes ___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX

APPENDIX C

Wetland Photos

APPENDIX

Select Site Photos (9/17/2024)

	**Photo 1:** Wetland 1, Sample Point 1 Wet Direction Photo is Taken: West Photo Location: Photo ID 15. Within Wetland 1
	**Photo 2:** Sample Point 2 Up Direction Photo is Taken: North Photo Location: Photo ID 2 Up
	**Photo 3:** Sample Point 2 Up Direction Photo is Taken: North Photo Location: Photo ID 2 Up

APPENDIX

	**Photo 4:** Sample Point 3 Up Direction Photo is Taken: West Photo Location: Photo ID 3 Up
	**Photo 5:** Union Ditch No. 2 Direction Photo is Taken: North Photo Location: Photo ID 11. west bank of ditch
	**Photo 6:** Overall site – Upland Field Direction Photo is Taken: North Photo Location: Photo ID 1.

APPENDIX

APPENDIX D

Antecedent Precipitation Data

NRCS method - Rainfall Documentation Worksheet Hydrology Tools for Wetland Determination
NRCS Engineering Field Handbook Chapter 19

Date	10/3/2025	**Landowner/Project**	Cortland Solar LLC
Weather Station	DeKalb	**State**	Illinois
County	DeKalb	**Growing Season**	1998
Photo/obs Date	9/1/2024	**Soil Name**	152A

shaded cells are locked or calculated

Long-term rainfall statistics (from WETS table or State Climatology Office)

	Month	**30% chance <**	**30% chance >**	**Precip**	Condition **D**ry, **W**et, **N**ormal	Condition Value	Month Weight Value	Product of Previous 2 Columns
1st Prior Month*	August	2.69	4.84	2.12	D	1	3	3
2nd Prior Month*	July	2.49	4.80	6.71	W	3	2	6
3rd Prior Month*	June	2.77	5.53	4.81	N	2	1	2
							Sum	**11**

*compared to photo/observation date

Note: If sum is	
6 - 9	prior period has been drier than normal
10 - 14	prior period has been normal
15 - 18	prior period has been wetter than normal

Condition value:
Dry =1
Normal =2
Wet =3

Conclusions: **prior period has been normal**

CoCoRaHS Data Explorer | Search Stations | About | Roadmap | Feedback

Viewing Station: **IL-DK-28 : De Kalb 0.7 SW** Jul 7, 2016 - Oct 3, 2025 3,136 Total Observations

View: Station Overview

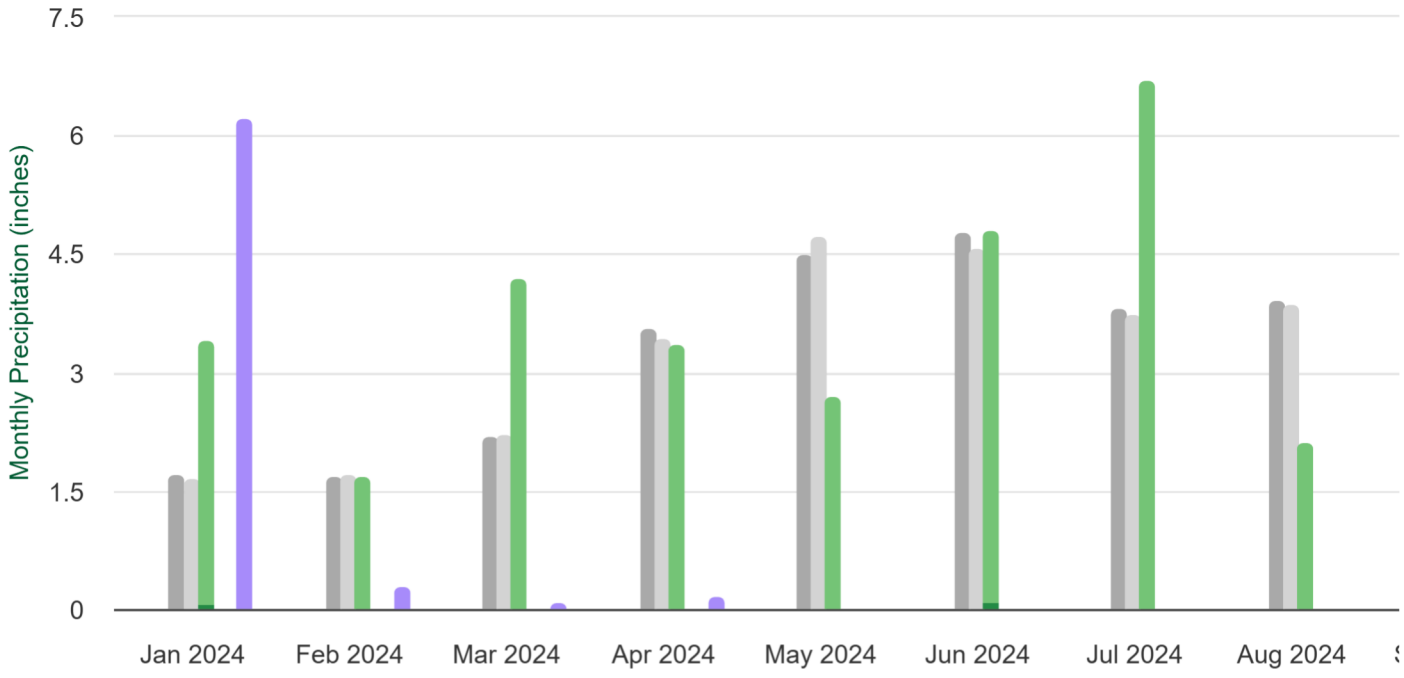
Precipitation Summary

Date Range to Display | Shortcuts | 1/1/2024 | 9/30/2024 | Update

Month	Daily Prec...	Multiday ...	Total Preci...	NOAA No...	PRISM No...	Snowfall (i...
Jan 2024	3.36	0.07	3.43	1.73	1.68	20.8
Feb 2024	1.69	0.00	1.69	1.69	1.73	1.0
Mar 2024	4.21	0.00	4.21	2.2	2.23	0.3
Apr 2024	3.37	0.00	3.37	3.58	3.45	0.6
May 2024	2.72	0.00	2.72	4.5	4.75	0.0
Jun 2024	4.71	0.10	4.81	4.79	4.59	0.0
Jul 2024	6.71	0.00	6.71	3.83	3.75	0.0
Aug 2024	2.12	0.00	2.12	3.93	3.88	0.0
Sep 2024	1.61	0.00	1.61	3.44	3.33	0.0
Totals for Period Selected	**30.50**	**0.17**	**30.67**	**29.69**	**29.39**	**22.7**

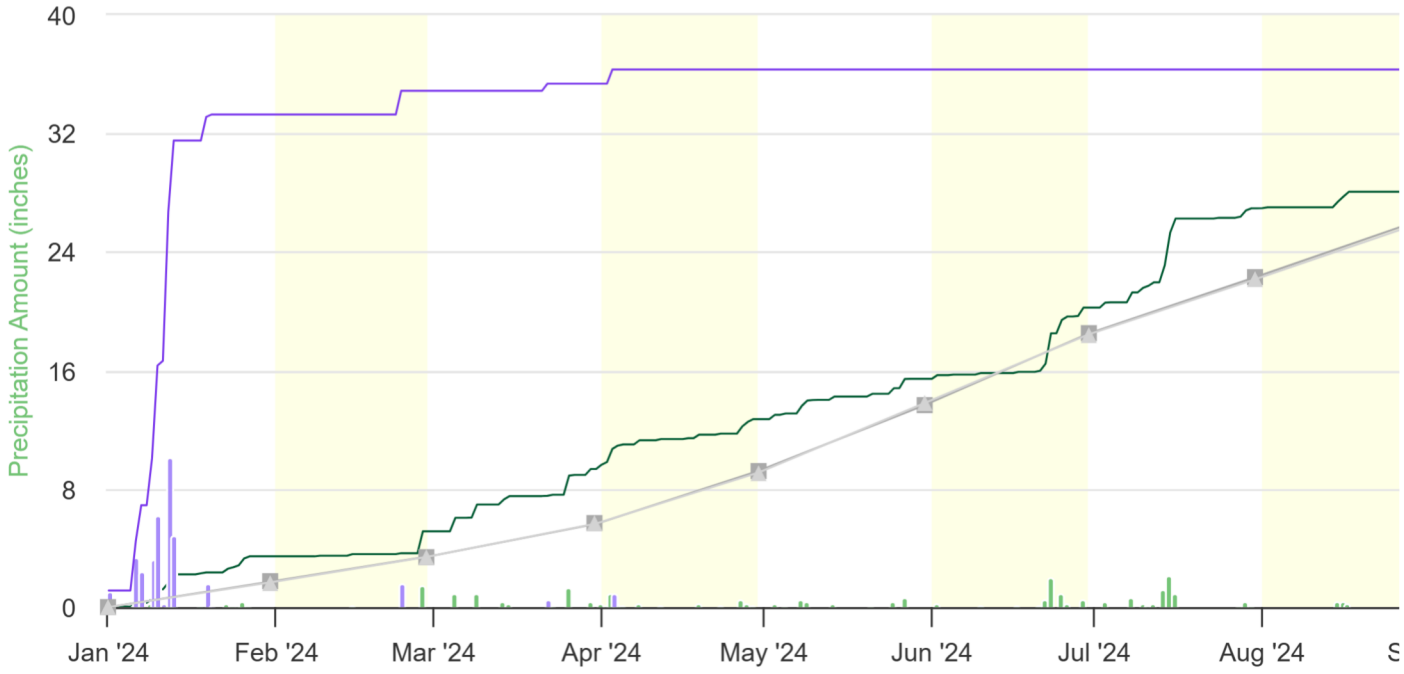
Monthly Precipitation from Jan 01, 2024 to S

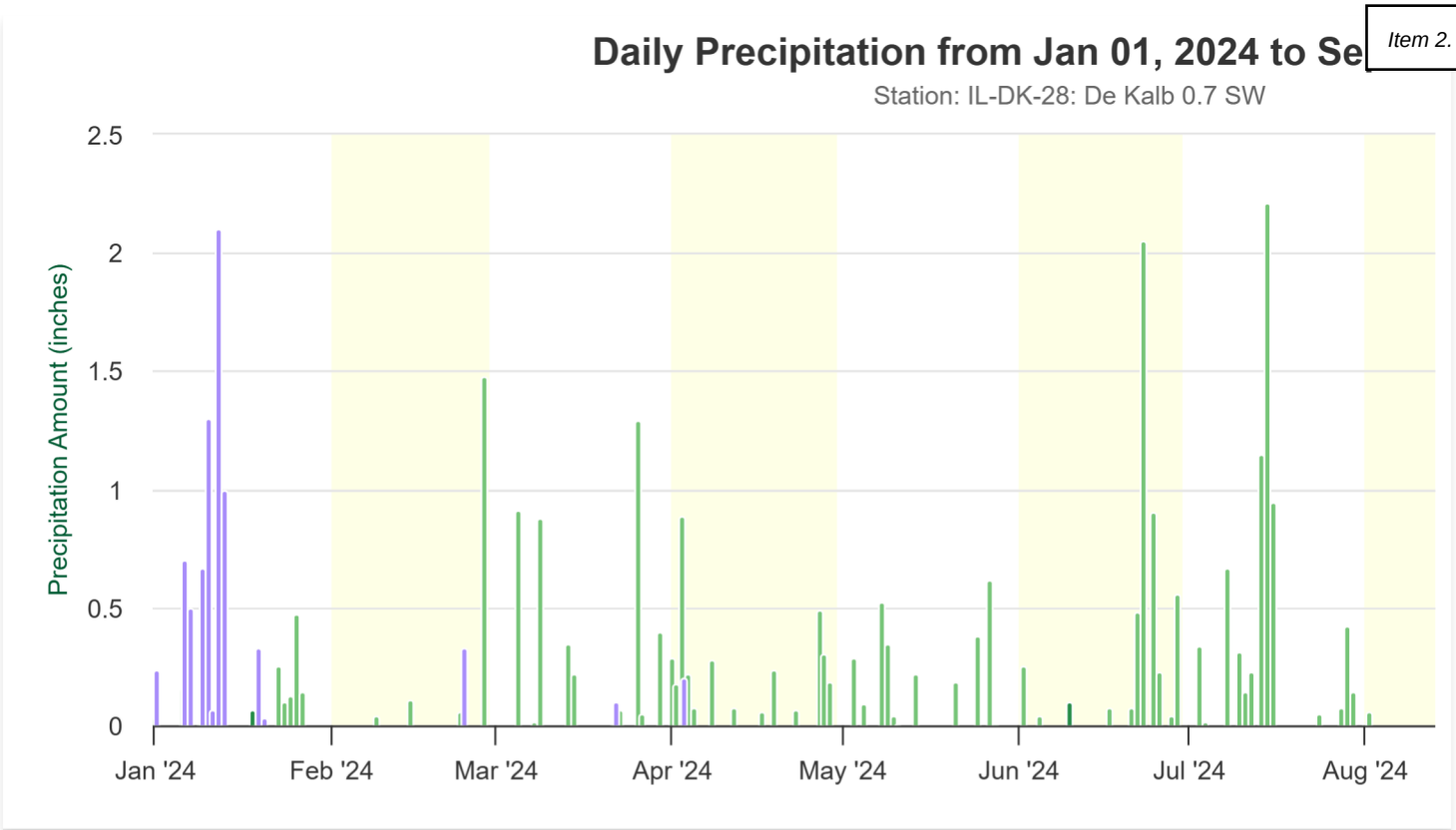
Station: IL-DK-28: De Kalb 0.7 SW



Accumulated Precipitation Jan 01, 2024 to Sep 3

Station: IL-DK-28: De Kalb 0.7 SW




Daily Precipitation from Jan 01, 2024 to Se
Station: IL-DK-28: De Kalb 0.7 SW
Precipitation Amount (inches)
2.5
2
1.5
1
0.5
0
Jan '24
Feb '24
Mar '24
Apr '24
May '24
Jun '24
Jul '24
Aug '24

WETS Station: DE KALB, IL

Requested years: 1991 - 2020

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	28.1	13.1	20.6	1.69	1.07	1.99	5	10.2
Feb	32.5	16.6	24.6	1.71	1.02	2.07	4	8.7
Mar	45.0	26.8	35.9	2.24	1.45	2.69	5	4.4
Apr	58.6	37.3	48.0	3.56	2.56	4.17	7	1.3
May	70.2	49.2	59.7	4.79	3.28	5.87	8	0.0
Jun	79.9	59.5	69.7	4.57	2.77	5.53	7	0.0
Jul	83.1	63.3	73.2	4.00	2.49	4.80	6	0.0
Aug	81.2	61.3	71.3	4.06	2.69	4.84	6	0.0
Sep	74.9	53.2	64.1	3.32	1.73	4.05	6	0.0
Oct	62.0	41.0	51.5	2.96	1.76	3.58	6	0.1
Nov	46.3	29.6	38.0	2.31	1.38	2.73	5	1.8
Dec	33.6	19.1	26.4	2.04	1.27	2.44	5	6.6
Annual:					33.97	40.71		
Average	58.0	39.2	48.6	-	-	-	-	-
Total	-	-	-	37.25			70	33.1

GROWING SEASON DATES

Years with missing data:	24 deg = 3	28 deg = 3	32 deg = 2
Years with no occurrence:	24 deg = 0	28 deg = 0	32 deg = 0
Data years used:	24 deg = 27	28 deg = 27	32 deg = 28
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	4/1 to 11/8: 221 days	4/12 to 10/25: 196 days	4/23 to 10/16: 176 days
70 percent *	3/28 to 11/13: 230 days	4/7 to 10/30: 206 days	4/18 to 10/21: 186 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1966			1.20	3.25	3.07	2.78	1.45	2.51	2.47	2.47	4.91	2.32	26.43
1967	2.75	1.17	2.07	5.09	1.46	5.14	2.76	2.60	1.81	3.62	2.00	0.96	31.43
1968	0.45	0.52	0.32	2.10	2.48	5.47	5.22	4.06	M4.90	0.78	3.52	1.90	31.72
1969	1.31		M0.04	4.33	3.48	6.38	5.28	1.45	2.85	6.75	1.32	1.47	34.66
1970	0.94	0.56	1.84	2.73	6.01	6.57	6.03	1.11	11.56	2.69	1.68	1.35	43.07
1971	1.17	2.06	1.87	1.34	1.73	2.20	2.01	3.26	2.80	2.04	2.14	4.62	27.24
1972	0.91	0.86	3.95	4.57	4.00	8.81	5.33	8.34	5.08	3.86	1.83	2.10	49.64
1973	1.32	1.04	4.14	6.50	5.49	3.18	2.22	1.93	5.95	3.36	3.01	3.13	41.27
1974	4.08	1.65	2.04	3.43	6.42	6.94	2.08	2.09	0.85	2.31	2.84	1.96	36.69

Appendix I: IDOT Access Driveway Feasibility Response

Feasibility Request for Access Driveway off Route 38

Harsted, Joshua M. <Joshua.Harsted@illinois.gov>

Tue 4/30/2024 11:53 AM

To:Lillian Prybil <LPrybil@wsbeng.com>

3 attachments (692 KB)

NonCommercial Rural detail.pdf; D3 Access Form (Fillable Form) (003).pdf; New Access Permit Letter.pdf;

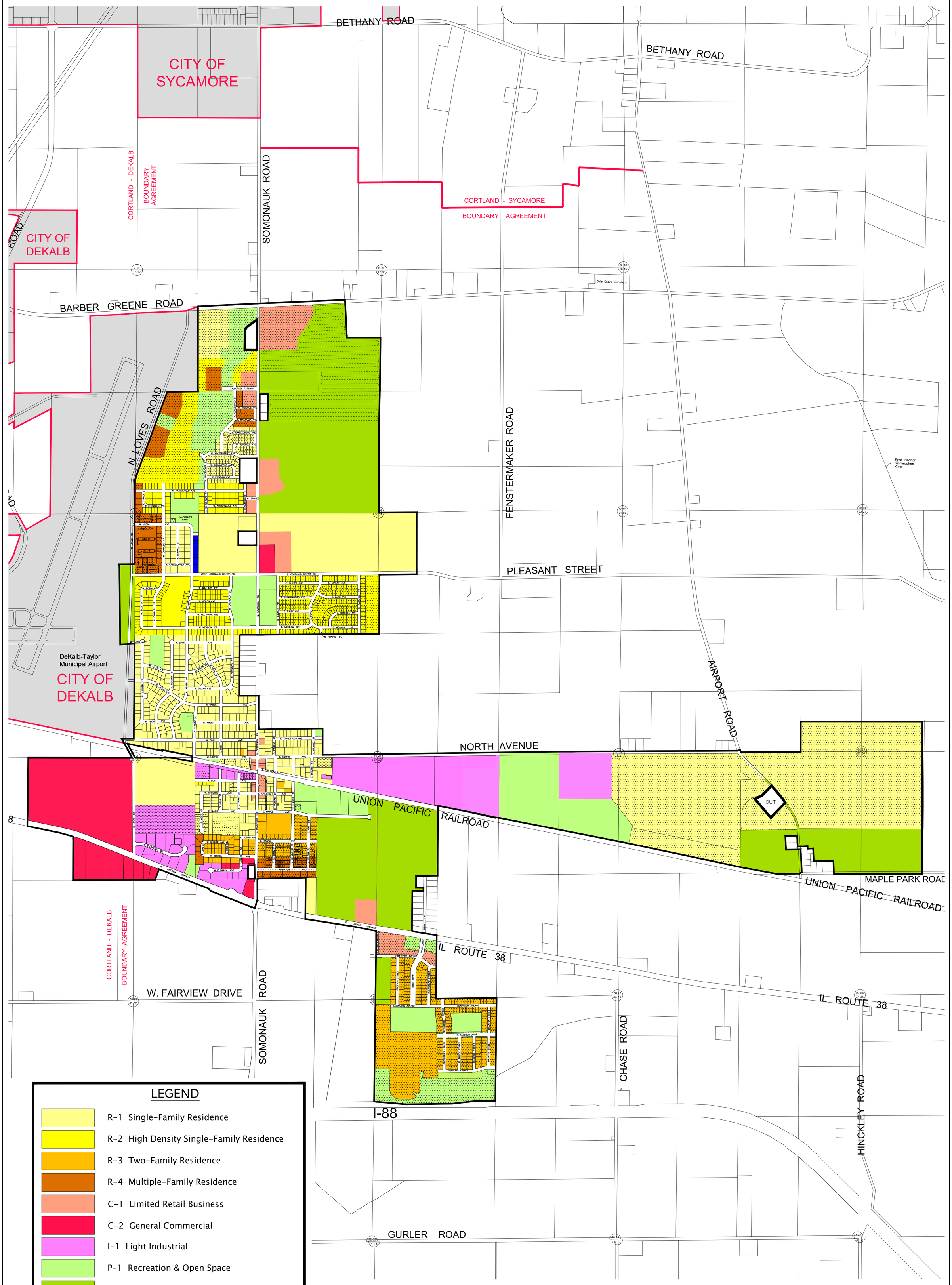
EXTERNAL EMAIL

The location of the entrance is feasible to construct. It should be constructed following the attached detail for a rural non-commercial entrance in addition to the following . The entrance shall be a minimum of 50’ from the edge of any intersecting road.
Please use the Access Permit Letter and the D3 Access form to guide you in the permitting process.

Thanks!

Joshua Harsted
ET V Permits Section Chief
ILLINOIS DEPARTMENT OF TRANSPORTATION
DISTRICT 3

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.


CITY OF SYCAMORE
CITY OF DEKALB
BETHANY ROAD
BETHANY ROAD
CORTLAND - DEKALB BOUNDARY AGREEMENT
SOMONAUK ROAD
CORTLAND - SYCAMORE BOUNDARY AGREEMENT
BARBER GREENE ROAD
N. LOVES ROAD
FENSTERMAKER ROAD
PLEASANT STREET
Ohio Grove Cemetery
East Branch Kishwaukee River
DeKalb-Taylor Municipal Airport
CITY OF DEKALB
AIRPORT ROAD
NORTH AVENUE
UNION PACIFIC RAILROAD
OUT
MAPLE PARK ROAD
UNION PACIFIC RAILROAD
IL ROUTE 38
W. FAIRVIEW DRIVE
SOMONAUK ROAD
CHASE ROAD
I-88
HINCKLEY ROAD
GURLER ROAD
McPHILLIPS PARK
TALLGRASS PARKWAY
W. PRAIRIEFIELD AVE
W. FERNGLEN AVE
W. AUBURNDALE AVE
W. CHRISTOPHER AVE
WEST CORTLAND CENTER RD
E. CORTLAND CENTER RD
W. MALLARD AVE
W. HERON AVE
W. RED HAWK AVE
W. MEADOW DR
E. MEADOW DR
E. PRAIRIE ST.
W. LINDA AVE
W. SUSAN AVE
W. CAROL AVE
W. AMBER AVE
W. PINE AVE
E. CONESTOGA AVE
W. NORTH AVE
E. NORTH AVE
E. RAILROAD AVE
W. ELM AVE
W. CHESTNUT AVE
E. CHESTNUT ST
W. MAPLE AVE
E. MAPLE AVE
W. SOUTH AVE
E. SOUTH AVE
W. GEORGE AVE
W. BENSON AVE
W. ELLWALK AVE
ROBINSON AVE
E. LINCOLN HIGHWAY
STRATFORD AVENUE
LEXINGTON AVENUE
ASHFORD AVENUE
E. FAIRVIEW DRIVE
HAHN DRIVE
W. LINCOLN HIGHWAY
W. STEPHENIE DR
W. CLEVELAND AVE
W. KLEIN AVE
W. STONEG
W. GRANNY ST
W. BLUEBELL AVE
W. SANDALWOOD AVE
W. MISSOURI AVE
W. MISSOURI AVE
W. WINTERBERRY AVE
W. CRABAPPLE AVE
W. PAMPAS AVE
W. ROBIN WAY
W. BLUE JAY DR
W. SPARROW ST
W. EAGLE AVE
W. ELDER AVE
W. KEENE AVE
N. SPRUCE ST
N. ASPEN DR
N. ARBOR ST
N. CHARLES ST
N. EDWARD ST
N. DOGWOOD ST
N. SOMONAUK RD
N. PRAIRIE ST
N. MAPLE ST
N. MAIN ST
N. PAMPAS DR
N. PRAIRIE ST
N. LOCUST ST
N. CHESTNUT ST
N. MAPLE ST
N. SOMONAUK RD

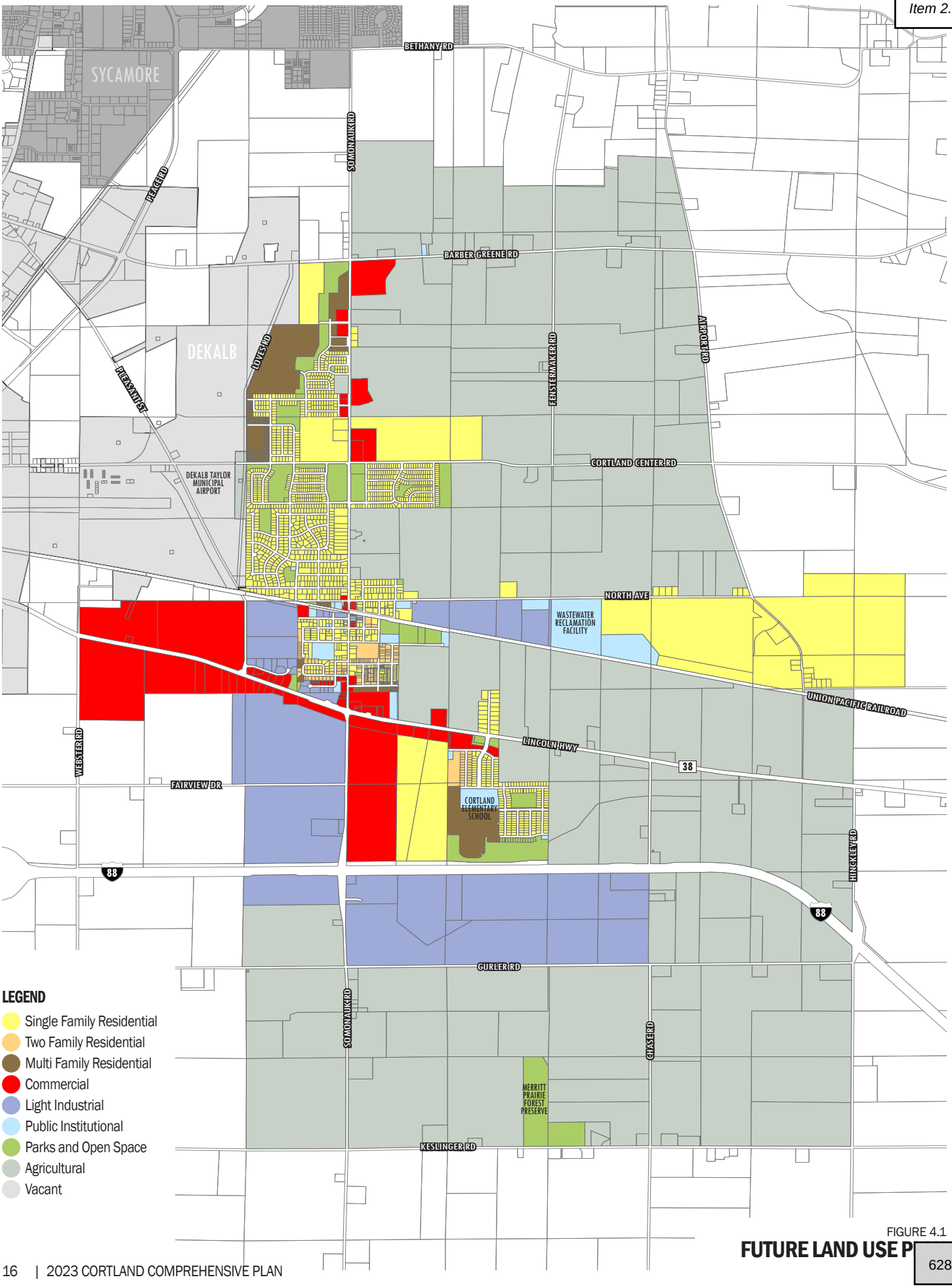


FIGURE 4.1
FUTURE LAND USE P

In accordance with 9-10-6. – Procedures, C. Report of Hearing; Within thirty (30) days following the hearing, the plan commission shall transmit to the town board a written report giving its findings as to compliance of the proposed special use with the standards governing special uses and giving its recommendation for action to be taken by the town board.

9-10-3. – Standards

A special use permit shall be granted only if evidence is presented to establish that:

A. The proposed structure or use at the particular location requested is necessary or desirable to provide a service or a facility which is in the interest of the public and will contribute to the general welfare of the neighborhood or community;

B. The proposed structure or use will not have a substantial adverse effect upon the adjacent property, the character of the neighborhood, traffic conditions, utility facilities and other matters affecting the public health, safety and general welfare;

C. The proposed structure or use will be designed, arranged and operated so as to permit the development and use of neighboring property in accordance with the applicable district regulations.

D. Such other standards and criteria as are established by the ordinance for a particular special use as set forth in section 9-10-4 of this chapter and as applied to planned developments as set forth in chapter 7 of this title (Ord. 2008-03, 1-28-2008) – **NOT APPLICABLE**

9-10-5. – Conditions

The plan commission may recommend and the town board may impose such conditions or restrictions upon the location, construction, design and operation of a special use including, but not limited to, provisions for off street parking spaces and the duration of such permit, as they shall respectively find necessary or appropriate to secure compliance with the purpose an intent of this title and other standards set forth herein. (Ord. 2008-03, 1-28-2008)

Date Filed:	11/5/25
Job Number:	N/A
PC Number:	PC 25-01

LAND DEVELOPMENT APPLICATION

THE UNDERSIGNED RESPECTFULLY PETITIONS THE TOWN OF CORTLAND TO REVIEW AND CONSIDER GRANTING THE FOLLOWING APPROVAL ON THE LAND HEREIN DESCRIBED.
(Check all that apply)

- ☐ Annexation* ☐ Rezoning from _____ to _____
- ☑ Text Amendment (attached proposed language)
- ☐ Special Use Permit for a: ☐ Planned Unit Development ☐ Other _____
- ☐ Planned Unit Development:
  - ☐ Concept Plan ☐ Preliminary Development Plan ☐ Final Development Plan
- ☐ Subdivision Plat: ☐ Preliminary Subdivision Plat ☐ Final Subdivision Plat

** Attach an original copy of the annexation petition to this application*

PLEASE PRINT OR TYPE IN BLUE OR BLACK INK

PART I. APPLICANT INFORMATION

	APPLICANT	LAND OWNER *(If not the Applicant)*	CONTACT PERSON *(If not the Applicant)*
Name:	Brandy Williams		
Company	Town of Cortland		
Address:	59 S. Somonauk Road, PO Box 519		
	Cortland, IL 60112-0519		
E-mail:	engineer@cortlandil.org		
Phone:	815-756-9041		

IS THE APPLICANT THE OWNER OF THE SUBJECT PROPERTY? ☑ YES ☐ NO

*(If the Applicant is not the owner of the subject property, a notarized letter from the Owner authorizing the Applicant to file the **Land Development Application** must be attached to this application.)*

IS THE APPLICANT AND/OR OWNER A TRUSTEE OR A BENEFICIARY OF A LAND TRUST? ☐ YES ☐ NO

(If the Applicant and/or Owner of the subject property is a Trustee of a land trust or beneficiary(ies) of a land trust, a disclosure statement identifying each beneficiary of such land trust by name and address and defining his/her interest therein shall be verified by the Trustee and shall be attached hereto.)

Cortland Land Development Application

Date Filed: 11/5/25

PC Number: PC 25-01

PART II. PROPERTY INFORMATION

ADDRESS OF PROPERTY: _____

PARCEL INDEX NUMBER(S): _____

LEGAL DESCRIPTION: *A FULL LEGAL DESCRIPTION MUST BE ATTACHED TO THIS APPLICATION*

TOTAL AREA OF SUBJECT PROPERTY(IES) (*ACRES*): _____

IF SUBDIVIDING, NUMBER OF LOTS BEING CREATED: _____

CURRENT ZONING: _____ **PROPOSED ZONING:** _____

RECOMMENDED LAND USE: _____

(Based upon the recommendations of the Cortland Town Plan)

PROPOSED LAND USE: _____

NAME OF PROPOSED DEVELOPMENT: _____

The subject property is located in which FIRE PROTECTION DISTRICT? _____

The subject property is located in which SCHOOL DISTRICT? _____

Attach relevant checklist(s) and associated information as outlined during the pre-application meeting. ☐

I, Brandy Williams/Town of Cortland, hereby apply for review and approval of this application and represent that the application and requirements thereof and supporting information have been completed in accordance with the Zoning Ordinance and/or Subdivision Ordinance of the Town of Cortland.

Brandy Williams
Signature of Applicant

11/5/25
Date

State of Illinois
County of DeKalb.

Signed before me on Nov. 5th, 2025 by Brandy Williams
Applicant

(Seal)

Cheryl L Aldis
Signature of Notary Public

OFFICIAL SEAL
CHERYL L ALDIS
Notary Public, State of Illinois
Commission No. 927563
My Commission Expires March 09, 2029

SECTION THREE:

That Title 9, "Zoning Regulations" Chapter Three, "Miscellaneous Zoning Regulations, Section 9-3-13.B.2 "Table of Permitted Yard Obstructions" shall be amended as follows:

Structure Or Use	Front Yard	Corner Side Yard	Side Yard	Rear Yard
Animal houses, for domestic animals, excepting domesticated hens, not to exceed 16 square feet in area and 4 feet in height				P

That Title 9, "Zoning Regulations" Chapter Three, "Miscellaneous Zoning Regulations, Section 9-3-13.B.2 "Table of Permitted Yard Obstructions" shall be amended to add a new row as follows:

Chicken coop with enclosed run (in accordance with Section 9-4-35 of this title)				P

SECTION FOUR: That Title 9, "Zoning Regulations", Chapter 4 "Supplementary Regulations for Specific Uses" shall be amended by adding a new Section 9-4-35 below:

9-4-35: Chicken Coops and Enclosures

A. *Lot:* Only lots zoned and used for single-family purposes (or agricultural property) that are 11,000 square feet or larger may have hens.
B. *Location:* Coops must be in rear yards and at least twelve (12) feet from property lines and not within any easement on the subject property.
C. *Size:* A chicken coop up to one hundred and forty-four (144) square feet and an enclosed outside run of at least thirty-two (32) square feet is required.

TOWN OF CORTLAND
COUNTY OF DEKALB
STATE OF ILLINOIS

ORDINANCE NO. 2025-XX

AN ORDINANCE ALLOWING DOMESTICATED HENS AND CHICKEN COOPS/ENCLOSURES SUBJECT TO CERTAIN REGULATIONS

ADOPTED BY THE MAYOR AND BOARD OF TRUSTEES OF THE TOWN OF CORTLAND, DE KALB COUNTY, ILLINOIS ON THE _____ DAY OF _____, 2025.

ORDINANCE NO. 2025-XX

TOWN OF CORTLAND, ILLINOIS

AN ORDINANCE ALLOWING DOMESTICATED HENS AND CHICKEN COOPS/ENCLOSURES SUBJECT TO CERTAIN REGULATIONS

WHEREAS, the Town of Cortland (the "Town") is a non home-rule municipality created in accordance with the Constitution of the State of Illinois of 1970 and the laws of the State; and

WHEREAS, pursuant to Sections 11-5-3, 11-5-6, and 11-20-9 of the Illinois Municipal Code (65 ILCS 5/11-5-3, 5/11-5-6, and 5/11-20-9), the Town of Cortland has the power to regulate the keeping of animals including domesticated hens within the Town; and

WHEREAS, the Mayor and Town Board deem it appropriate to modify various provisions of the Cortland Municipal Code in order to allow and regulate the keeping of domesticated hens within chicken coops/enclosures in furtherance of the health, safety, and welfare of the citizens of the Town of Cortland; and

WHEREAS, given that portions of the zoning chapter of the Cortland Municipal Code require amendment, a public hearing was held before the Cortland Planning Commission on _____, 2025 in accordance with state law; and

WHEREAS, the Cortland Planning Commission has recommended approval of the text amendments to the zoning chapter in accordance with this ordinance.

THEREFORE, BE IT ORDAINED BY THE MAYOR AND THE BOARD OF TRUSTEES OF THE TOWN OF CORTLAND, DE KALB COUNTY, ILLINOIS, THAT:

SECTION ONE: That Title 4, "Public Health and Safety" shall be amended by modifying the current subsection M of Section 4-2-1 to provide as follows (strikeout below to be deleted):

4-2-1: Nuisances Enumerated

M. *Keeping Animals or Fowl*. To keep or suffer any swine, goats, ~~chickens,~~ ducks, and geese in any enclosure or pen within the town unless within an agricultural zoning district, or to keep house or pasture within the town any swine, sheep, goats, ~~chickens~~, ducks or geese so as to be offensive to those residing in the vicinity.

SECTION TWO:

That Title 5, "Police Regulations" shall be amended by adding a new Article B as follows:

CHAPTER 1, ARTICLE B– DOMESTICATED HENS

5-1B-1: Definitions

- Coop: An enclosed structure with a roof for housing hens.
- Domesticated Hen: A female chicken (*Gallus gallus domesticus*) kept on residential or agricultural property as permitted.
- Rooster: A male chicken (*Gallus gallus domesticus*); prohibited within town limits.
- Slaughtering: Killing of hens for any purpose (except for humane reasons); prohibited.

5-1B-2: Keeping of Domesticated Hens

A. Hens may only be kept in accordance with the provisions of this Article.
B. The keeping of hens must avoid nuisances and unhealthy conditions.
C. No keeping of hens shall unreasonably interfere with the use of neighboring properties.

5-1B-3: Restrictions

A. Only lots zoned and used for single-family purposes (or agricultural property) that are 11,000 square feet or larger may have hens.
B. No more than six (6) hens per lot shall be permitted.
C. Roosters are prohibited.
D. Coops must be in rear yards, located not less than twelve (12) feet from property lines, and not located within any easement area on the subject property.
E. Slaughtering is prohibited.

5-1B-4: Coop and Run Requirements

A. A chicken coop up to one hundred and forty-four (144) square feet and an enclosed outside run of at least thirty-two (32) square feet is required.
B. No electric connection made via extension cords shall be allowed.
C. Hens must be confined within the coop, cage or in an appropriate run at all times.

5-1B-5: Sanitation

A. Coops must be rodent-free, clean, and sanitary.
B. Feed must be stored in sealed containers.
C. Waste must not cause detectable odors on adjacent lots.
D. Noise from hens must not disturb neighboring residents.

5-1B-7: Enforcement and Compliance

Complaints will be investigated by the Town of Cortland Police Department. Violations may result in citations and fines through the administrative adjudication process or any other process permitted by law.

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C. *Size:* A chicken coop up to one hundred and forty-four (144) square feet and an enclosed outside run of at least thirty-two (32) square feet is required.

SECTION FIVE: Effective Date. This Ordinance shall be in full force and effect after its passage and publication as provided by law.

PASSED, APPROVED AND ADOPTED by the Corporate Authorities of the Town of Cortland, Illinois this _____ day of _____, 2025 and filed in the office of the Town Clerk of said Town on this date.

MAYOR & TRUSTEES	AYE VOTE	NAY VOTE	ABSTAIN / ABSENT
Brad Stone			
Mike Siewierski			
Randi Olson			
Victoria Haier			
Douglas Corson			
Charmaine Fioretto			
Mayor Mark Pietrowski			
TOTAL VOTES:			

APPROVED: _____, Date ____/ ____ / 2025
Mayor, Town of Cortland

ATTEST: _____, Date: ____/____ / 2025
Town Clerk, Town of Cortland