CITY COUNCIL WORKSHOP

Tuesday, May 21, 2024 at 6:00 PM

City Hall 8319 Co. Rd. 11 Breezy Point, MN 56472

(218) 562-4441 | Office Hours 8:00 a.m. - 4:00 p.m. | cityadmin@cityofbreezypointmn.us

AGENDA

1. SEWER DISCUSSIONS

A. Waste Water Treatment Facility Study Presentation

B. Terminal Road and Red Oak Lane Sewer Extension

TO: Mayor and City Council

FROM: Joe Zierden, Public Works Supervisor

RE: Wastewater Facility Study Comments

DATE: May 21, 2024

Background

The waste water treatment facility was constructed in 1978 consisting of the control building, primary treatment pond 1, storage pond 2, storage pond 3 and a 40-acre effluent irrigation field.

Below is a list/date of the major upgrades over the past 46 years at the wastewater treatment facility include:

- Original storage shed and storage addition build dates unknown 1980's to 1990's
- 1 additional storage pond 4 approximately 1992-93
- New spray field zones 1,2,3 (40 acres) approximately 1993
- New spray field zones 4, 5 (40 acres) approximately 2000
- 1 additional primary treatment pond 1A approximately 2004

Facility studies have been performed in 2001, 2011 and 2024. The 2001 study recommended construction of pond 1A and it also indicated a future site for pond 5 north of pond 4, sized at 9 million gallons (2001 study, page 4-16). The 2011 study identified 85% of winter capacity would be reached in 2023 (2011 study, page 11 & 2011 Capacity Analysis). An October 3, 2022 memo to city council on sewer capacities identified 85% of winter capacity would be reached within 5 years. The 2024 study identified a new pond of 10.5 million gallons as needed, along with needed structural repairs/replacement, fencing, gates and operational changes to reduce labor that will improve irrigation efficiency.

The various studies illustrate different approaches and thought processes to future growth and wastewater treatments needs, but all the studies demonstrate consistent growth with recommendations that have been implemented to handle the growth. Previous planning has kept the waster water treatment facility in tune with growth and forward thinking has allowed the facility to be well positioned to handle the upgrades required for the foreseeable future of Breezy Point.

EF-6 EF-5 EF-4 EF-3 EF-2 EF-1 EDGEWATER FARMS RD

S-1 S-2 S-3 S-4 S-5 S-6 S-7 S-8 S-9 S-10 S-11 S-12 S-13 S-14 S-15 S-16 S-17 S-18 S-19 S-20 S-21 S-22 S-23 S-24 S-25 S-26 S-27 S-28 S-29 S-30 S-31 S-32

EAGLEVIEW ELEMENTARY

LS-7 BREEZY POINT ARENA

SKI CHALET DRIVE

CSAH 11

NORTH STAR DR

AGATE WAY

RANCHETTE DRIVE

CAMPGROUND LS

LS-8

W-1 W-2 W-3 W-4 W-4A W-5 W-5A W-6 W-6A W-7

PAPPOOS CIRCLE

SQUAW CIRCLE

OREEN CIRCLE

WHITEBIRCH DRIVE

WHITEBIRCH GOLF COURSE

30-A 30-B 30-C 30-D 30-E 30-F 30-G 30-H 30-J 30-K

CSAH 11

SUFFOLK DRIVE

OC-1 OC-2 OC-3

ROBIN LN

OSCEOLA CIRCLE

WREN DR

DOVE STREET

D-1 D-2 D-3 D-4

ES-1 ES-2 ES-3 ES-4 ES-5 ES-6 ES-7

SPARROW DRIVE

EAGLE LANE

LS-6

SP-1 SP-2 SP-3 SP-4 SP-5

RP-1 RP-2 RP-3

RIDGE CIRCLE

O-1 O-2 O-3 O-4

CANARY LN

CSAH 11

RED PINE DR

CENTER CIRCLE

RISER

OWL CIRCLE

E-1 E-2 E-3 E-4 E-5

BREEZY POINT BOULEVARD

93-A 93-B 93-C 93-D 93-E 93-F 93-G 93-H

95-A

AIRPORT ROAD

108-A 108-B 108-C 108-D 108-E 108-F 108-G 108-H 108-I 108-J 108-K 108-L

LS-9

CITY HALL

LS-10

CH-1 CH-2 CH-3 CH-4 CH-5

CSAH 11

N LAKEVIEW DR

N BIRCHWOOD DR

N PINEWOOD DR

SPRUCE DR

CAMP LORA PI

WEAVERS POINT ROAD

ARNOLD PALMER DR

PALMER CT

N-1 N-2 N-3 N-4 N-5 N-6 N-7 N-8 N-9 N-10 N-11 N-12 N-13 N-14 N-15 N-16 N-17

DOUGLAS DR

MOOSE LN

GOPHER LN

FOX LOOP

GP-1 GP-2 GP-3 GP-4 GP-5 GP-6 FX-1 FX-2

WEAVERS POINT RD

APPLE LANE

N LAKEVIEW DR

BREEZY POINT DRIVE

AR-1 AR-2

LS-4

77B77C 77A

CIRCLE DR

CHANNEL HEIGHTS

CD

BAYVIEW PLACE

LS-3

SHOREVIEW LANE

LAKESHORE DRIVE

LS-1

PINEY WAY

LS-2

THRONE DRIVE

CO AR

WASTEWATER TREATMENT FACILITY

WWTF

CO

EWC-1 EWC-2 EWC-3

CSAH 4

NORTH

0 700 1400

SCALE (IN FEET)

WIDSETH
ARCHITECTS ▪ ENGINEERS ▪ SCIENTISTS ▪ SURVEYORS

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

JOSEPH DUBEL DATE: 01/09/2024 LIC. NO. 45590

DATE	REV#	REVISIONS DESCRIPTION	BY

DATE: JANUARY, 2024
SCALE: AS SHOWN
DRAWN BY: NCP
CHECKED BY: JED
JOB NUMBER: 2022-11981

SANITARY SEWER COLLECTION SYSTEM MAP
CITY OF BREEZY POINT
CROW WING COUNTY, MINNESOTA
APPENDIX A

SHEET NO.
APPENDIX A

V:\Projects\City of Breezy Point-32265\2019-10177\CADD\MAPPING\Sanitary Sewer Collection System-2020.dwg Plotted by:Nick Peterson 1/9/2024 11:18:00 AM

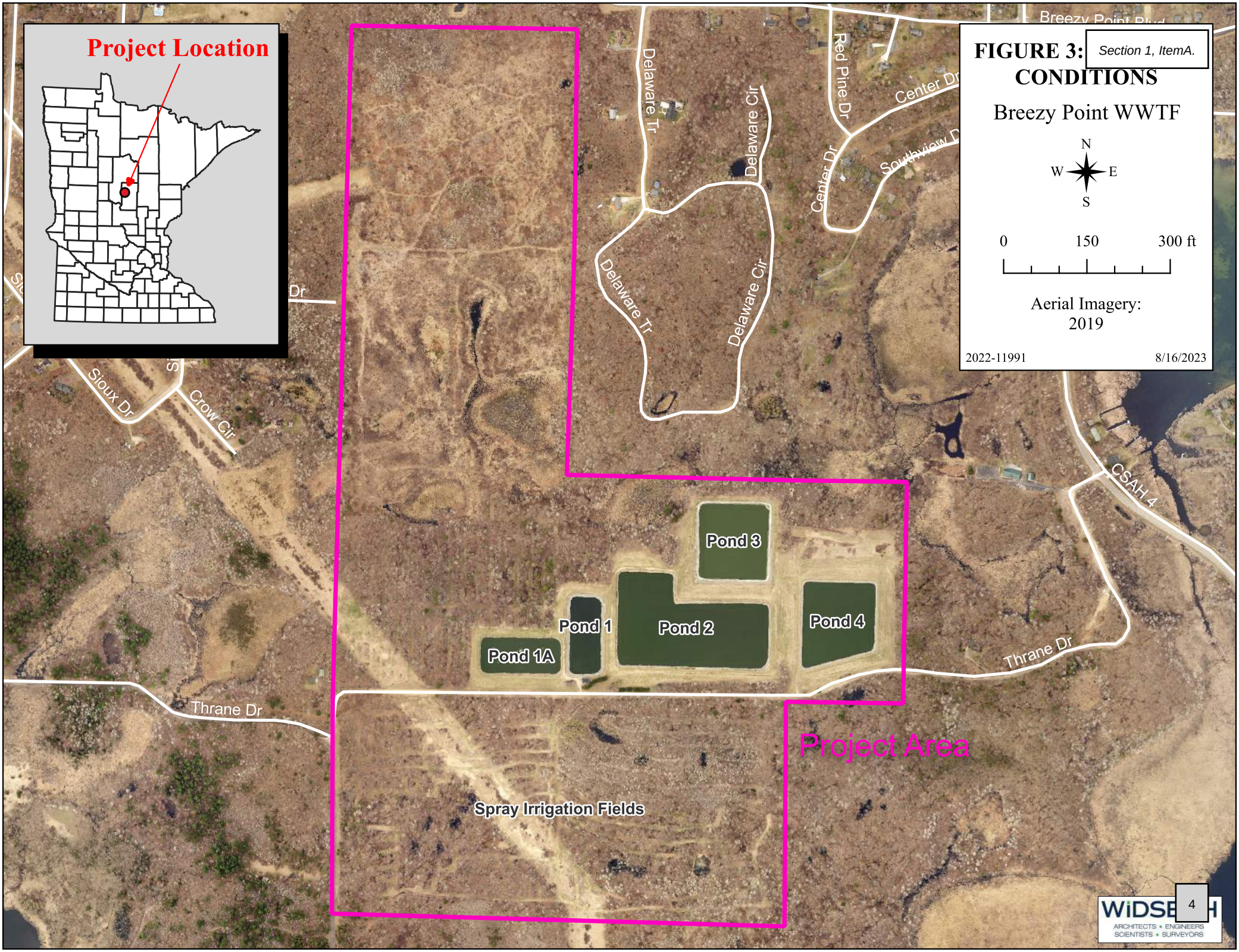


FIGURE 3: EXISTING CONDITIONS

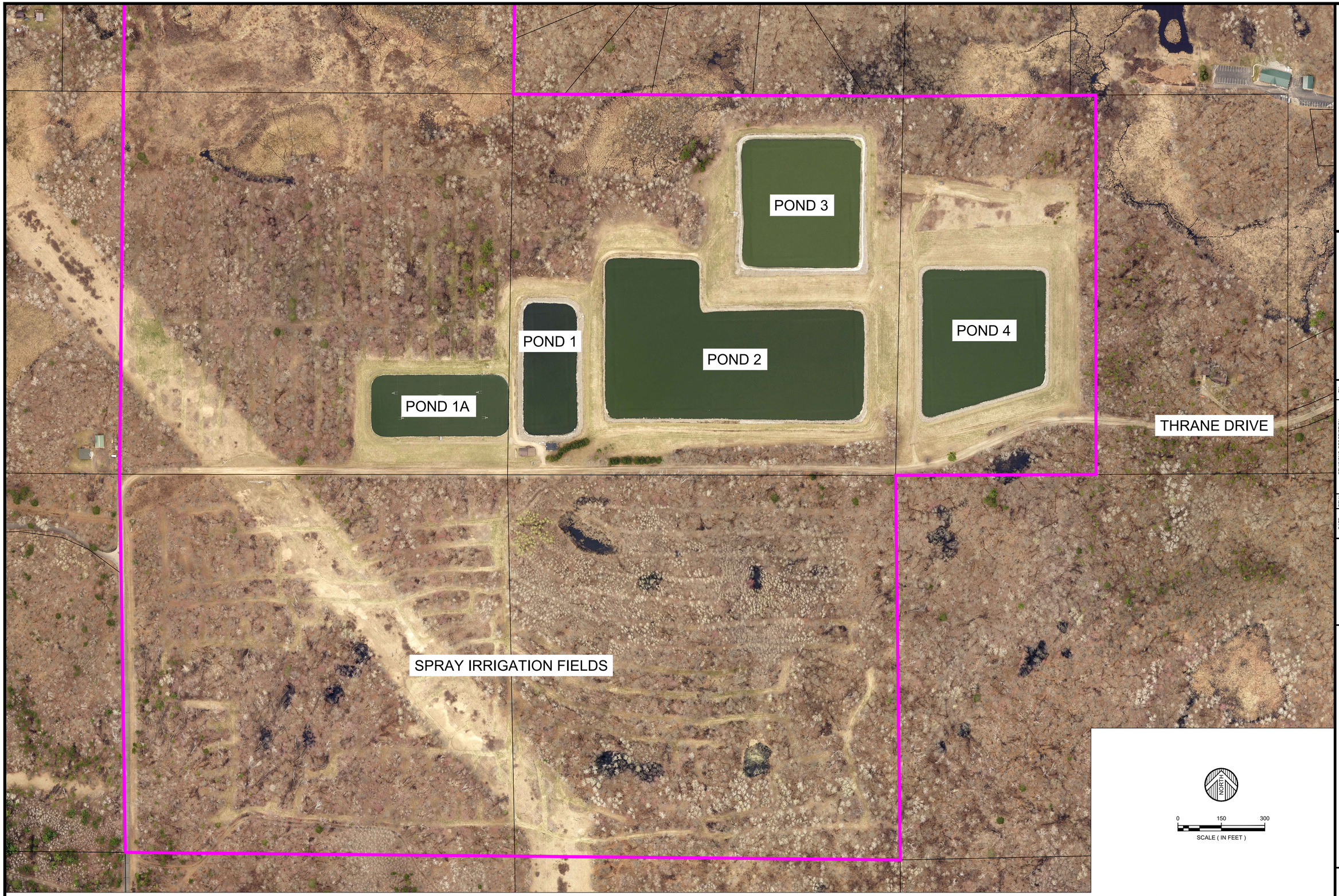
Breezy Point WWTF

N
W E
S

0 150 300 ft

Aerial Imagery: 2019

2022-11991 8/16/2023



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DATE: ####
LIC. NO. ####

REVISIONS DESCRIPTION	BY

DATE	REV#

DATE: JANUARY, 2024
SCALE: AS SHOWN
DRAWN BY: NCP
CHECKED BY: NCP
JOB NUMBER: 2022-11991

2023 WASTEWATER FACILITY STUDY
CITY OF BREEZY POINT
CROW WING COUNTY, MINNESOTA

APPENDIX C

SHEET NO.
APPENDIX C

APPENDIX D
ESTIMATED GROWTH
FLOW, POPULATION, ERU'S

			Design 36.3 MG		Design 74.1 MG			WWTP Estimate
		1.09%	1.94%	0.935%	2.077%	4.89%	1.89%	1604
		y = 0.2692x + 41.497	y = 0.3117x + 17.4		y = 0.7029x + 38.659	y = 82.857x + 1035.3	y = 17.301x + 1060.1	Avilable/(Needed)
	Year	Total Influent MG	Winter Influent	Summer Influent	Effluent Irrigation	Total Population	ERU's	ERU's
	1999	36.03	16.13	19.90				
	2000	37.36	14.30	23.06	36.20	979	967	
	2001	44.68	20.73	23.95	44.50	1,063	1,069	
	2002	46.32	21.20	25.12	42.04	1,151	1,106	
	2003	45.60	19.83	25.77	39.55	1,273	1,135	
	2004	43.97	19.74	24.23	27.82	1,373	1,200	
	2005	44.35	20.62	23.73	46.66	1,511	1,200	
	2006	42.15	19.56	22.59	39.22	1,642	1,200	
	2007	42.86	19.77	23.09	41.04	1,664	1,222	
	2008	43.25	19.54	23.71	49.15	1,774	1,230	
	2009	42.05	20.41	21.64	50.50	1,823	1,259	
	2010	44.24	20.74	23.50	47.41	2,346	1,259	
	2011	47.61	22.00	25.61	46.97	2,388	1,282	
	2012	51.09	23.64	27.45	50.50	2,394	1,301	
	2013	44.44	21.59	22.85	54.22	2,406	1,311	
	2014	46.66	20.61	26.05	59.93	2,408	1,320	
	2015	48.56	23.40	25.16	48.73	2,420	1,336	
	2016	49.82	23.24	26.58	54.98	2,436	1,353	
	2017	48.10	23.21	24.89	51.75	2,463	1,358	
	2018	47.18	23.21	23.97	53.92	2,485	1,369	
	2019	46.19	23.32	22.87	57.38	2,500	1,381	
	2020	43.02	23.63	19.39	40.27	2,574	1,410	
	2021	44.47	23.95	20.52	42.33	2,667	1,432	
	2022	46.70	24.26	22.44	58.08	2,858	1,440	164
Design Period	**2023**	**47.69**	**24.57**	**23.12**	**54.83**	**2,941**	**1,458**	**146**
	2024	47.96	24.88	23.08	55.53	3,024	1,475	129
	2025	48.23	25.19	23.03	56.23	3,107	1,493	111
	2026	48.50	25.50	22.99	56.93	3,190	1,510	94
	2027	48.77	25.82	22.95	57.64	3,272	1,527	77
	2028	49.03	26.13	22.91	58.34	3,355	1,545	59
	2029	49.30	26.44	22.86	59.04	3,438	1,562	42
ERU 85%	2030	49.57	26.75	22.82	59.75	3,521	1,579	25
	2031	49.84	27.06	22.78	60.45	3,604	1,596	8
ERU Design Cap	2032	50.11	27.37	22.74	61.15	3,687	1,614	(10)
	2033	50.38	27.69	22.69	61.85	3,770	1,631	(27)
	2034	50.65	28.00	22.65	62.56	3,852	1,648	(44)
Irrigation Cap 85%	2035	50.92	28.31	22.61	63.26	3,935	1,666	(62)
	2036	51.19	28.62	22.57	63.96	4,018	1,683	(79)
	2037	51.46	28.93	22.52	64.67	4,101	1,700	(96)
	2038	51.73	29.24	22.48	65.37	4,184	1,718	(114)

irrigation pumping structure

4.71 ac

New Mixers with automatic control system

8,225 sf

Thrane Dr

Thrane Dr

Thrane Dr

Demo existing garage and replace with new equipment Storage and heated shop building

Bituminous Drive

Demo and Replace Control Building
Bar Screen, Flume with transducer flow metering, irrigation control system, mixer-aeration control system, laboratory, bathroom

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LIC. NO. ####
DATE: ####
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REVISIONS DESCRIPTION	BY

DATE	REV#

DATE: MAY 2024
SCALE: AS SHOWN
DRAWN BY: ####
CHECKED BY: ####
JOB NUMBER: 2022-11991

2023 WASTEWATER FACILITY STUDY
CITY OF BREEZY POINT
CROW WING COUNTY, MINNESOTA
APPENDIX G - PROPOSED IMPROVEMENTS

Brainerd/Baxter
7804 Industrial Park Road
Baxter MN 56425

218.829.5117
Baxter@Widseth.com
Widseth.com

WASTEWATER FACILITY STUDY

CITY OF

BREEZY POINT, MINNESOTA

MAY 2024

Widseth No 2022-11991

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CERTIFICATION

WASTEWATER FACILITY STUDY

BREEZY POINT, Minnesota

By

WiDSETH

7804 Industrial Park Road ■ Baxter, MN 56425

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Timothy M. Houle, P.E. (MN PE 25132) For Joseph E. Dubel, P.E	45500 Reg. No.	May 15, 2024 Date

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FIGURES AND APPENDICES

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Appenices

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A. INTRODUCTION

Population, development, and wastewater flows have been increasing over the years. It is anticipated a new stabilization pond will be needed and possibly expansion of the existing spray irrigation. The Wastewater Treatment Facilities (WWTF) operates under Minnesota Pollution Agency (MPCA) Solid Disposal System (SDS) Permit MN0047457. This report is proactively looking at the City's wastewater system, as it pertains to the WWTF increase flows and aging infostructure of the facility.

The WWTF consists of a series of stabilization ponds treating wastewater so that it can be discharged via spray irrigation into wooded areas adjacent to the ponds on City-owned property. The city also owns land adjacent to the existing WWTF for additional expansion as the city population continues to grow.

This report will analyze the growth in the population, WWTF loading, spray irrigation limits, and the trend in the Equivalent Residential Units (ERU's) over the next 20-year period to see where the need in the system will the greatest and when it will be required.

Not all of the city is currently served by the municipal collection system. Many areas are served by individual sewage treatment systems (ISTS's), and it is not anticipated to change in the foreseeable future. Therefore, extensions of the sanitary sewer collection occur when new developments, homes, or where business are being built in close proximity to the sewer collection system.

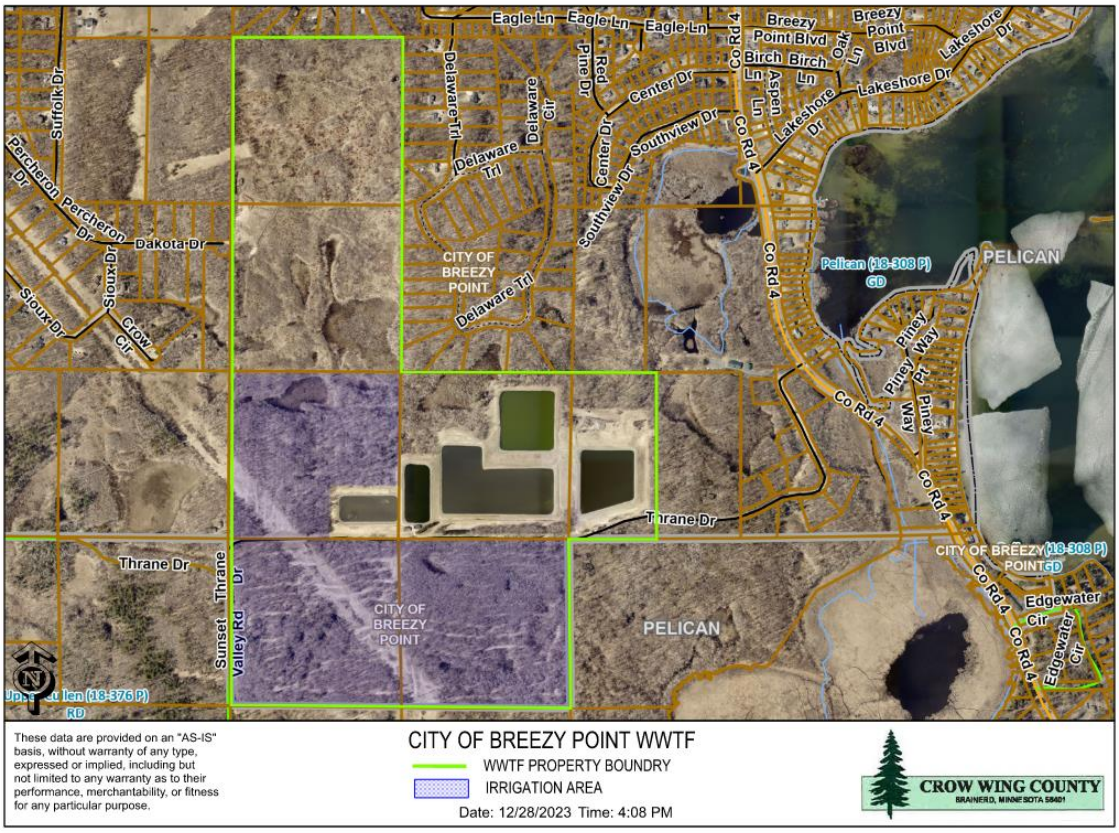
It is anticipated a new stabilization pond will be needed along with more spray irrigation in the near future. The city already owns land next to the existing WWTF for anticipated expansions for stabilization ponds and spray irrigation. Also, the "headworks" is aged, seen its useful life, and needs to be replaced.

B. PROJECT PLANNING AREA

a. Project Location

The City's WWTF is located, generally, in the southern portion of the city, west of Pelican Lake. FIGURE A shows the outline of the WWTF area, ponds, and unused land available for future expansion of the pond and irrigation system.

FIGURE A



b. Environmental Impacts

It is anticipated new improvements will be located next to the existing City WWTF on land presently owned by the city. As such, at this Study level point in time, significant environmental impacts are not anticipated. Preliminary review, as documented in the Environmental Information Worksheet (EIW; Appendix H), revealed the following:

i. The proposed Project received determinations of “no effect” or “not likely to adversely affect” federally listed threatened or endangered species. No critical habitats for threatened/endangered species were identified within the Project Area.

ii. The Project has the potential to impact Blanding’s turtles (*Emydoidea blandingii*), a state-listed threatened species, through habitat disturbance/destruction due to construction activities. An avoidance plan is required.

iii. The Project Area falls within a Minnesota Biological Survey (MBS) Site of High Biodiversity Significance. The EIW lists some preventative actions that need to be taken in order to minimize disturbance to this ecologically sensitive area.

iv. The southeastern corner of the spray irrigation fields lies within a shoreland buffer zone. Runoff of treated water used in spray irrigation will comply with stormwater management standards in Article 41 of the Crow Wing County Land Use Ordinance.

v. Sandy soils within the Project Area have a severe erosion hazard rating. Best management practices (BMPs) for erosion and sediment control to be included in the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater Permit must be followed by the Contractor.

vi. Water quality impacts due to surface-water runoff from the Project Area are anticipated to be insignificant due to the topography of the site, location in relation to the nearest

receiving water body, and planned establishment of vegetation onsite as quickly as possible. A Stormwater Pollution Prevention Plan (SWPPP) will be developed for the proposed improvements to the WWTF.

vii. The WWTF has met discharge criteria as set forth in the City's NPDES permit. Previous water quality data from a network of seven groundwater monitoring wells throughout the spray irrigation area show that the facility is functioning properly with high quality effluent used for irrigation.

viii. There are no known geological hazards (sinkholes, shallow limestone formations, karst conditions, etc.) near the Project Area.

ix. The Contractor will be required to follow BMPs to minimize temporary impacts during the construction phase of the Project (including noise, dust, and traffic detours).

x. State Historic Preservation Office (SHPO) database review identified a total of three archaeological site and seventeen historic properties in the vicinity of the Project Area. Based on the National Registry of Historic Places (NRHP) status of these sites and/or their proximity to the Project Area, no adverse impacts are anticipated as a result of the proposed WWTF expansion.

xi. The Project is not exempt from Section 106 review and will require further consultation with SHPO, tribal organizations, and other interested parties.

No other adverse environmental impacts are anticipated within the scope of the Project. Specific issues identified above will be addressed during the Design phase.

c. Population Trends

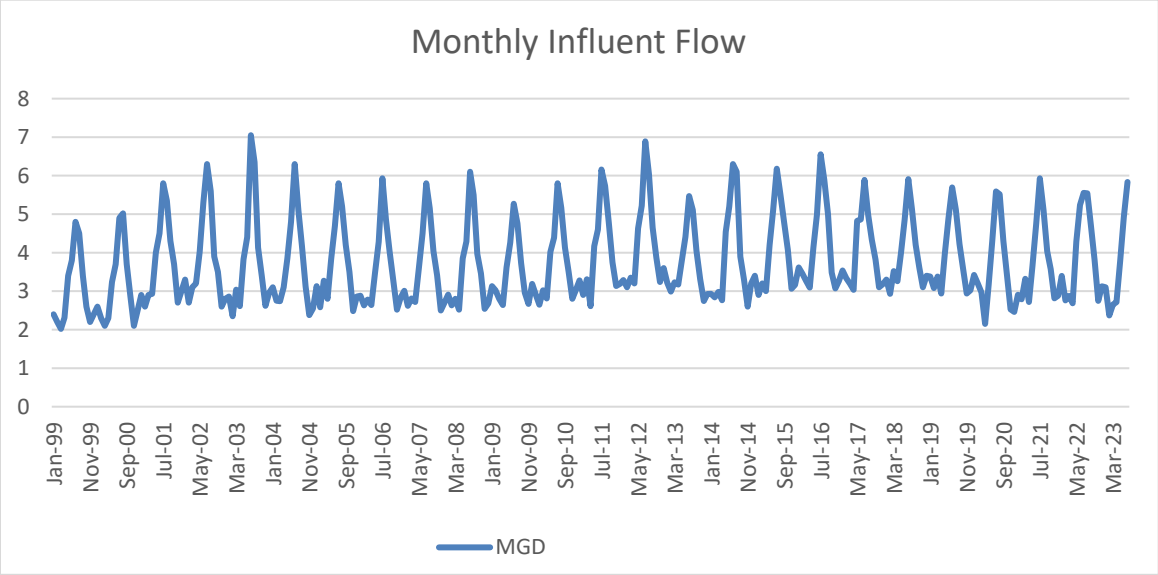
U.S. Census data shows the city grew at an annual rate of 4.89% from 2000 to 2020 (a population of 979 to 2,574). However, there are many factors that affect the relationship between sanitary sewer flow, population and the ERUs which make estimating for future growth more challenging. While the population in other (non-recreational) cities can be better predicted, the City of Breezy Point and some other neighboring communities have populations that double (and triple) during the summer months.

d. Wastewater Flows and Loading (Discharge Monitoring Reports)

The Discharge Monitoring Reports (DMRs) where collected from the MPCA web site and tabulated and are in Appendix D - Flow, Population, ERU's Estimated Growth to show the comparisons between the three sets of data used to determine the sequence of WWTF deficiency's to be addressed.

As seen in Appendix D the DMR flows, population, and ERUs were compared using past data to develop trendlines and project the future growth through the design period (2023-2043). The wastewater flows in most cities generally correlate with the population. With the increased level of flows from transient traffic, summer tourism, resort, and rentals the spike in the population makes this relationship not a reliable predicter. Figure B below shows the increased flow in the summer months peaking in July of each year attributed to the increased recreational population.

FIGURE B



C. EXISTING SANITARY SEWER FACILITIES

a. Existing Utility Location Maps

Appendix A contains a map for the location of the City's overall wastewater system. The city built the wastewater treatment facility and sewer infrastructure in 1978.

b. Existing Utility System Components

i. Wastewater Collection System and Forcemain.

The sanitary sewer collection system is mostly 8" PVC with some 10-inch totaling about 83,000 feet of gravity pipe, in addition to the gravity sewer pipe there is about 27,000 feet of forcemain consisting of 4, 6, 8, and 10-inch sized pipe.

ii. Wastewater Pump/Lift Stations

There are 10 Lift stations located throughout the collection system to maximize the gravity sewer. Lift Station #1 located at CSAH 4 & Thrane Drive collects all the sanitary sewer from the city and then pumps all the influent to the WWTF with the exception of The Camping Clusters II Development that pumps separately to the WWTF.

iii. Lift Station #1:

Both pumps were replaced in 2022 with 35 hp pumps. The lift station has been in good operating condition since 1978, when it was installed. The forcemain coming into Lift Station #1 has an existing flow rate of 600 gpm and is designed to run at a maximum of 1,000 gpm. Each pump runs on average 3 hours per day for a total of 6 hours of pump time within daily operating parameters.

iv. Wastewater Treatment Facility

The WWTF consists of one main lift station, 4,485 linear feet of 10-inch forcemain, mechanical bar screen, Parshall Flume, two aerated ponds, three stabilization ponds, chlorination equipment and chlorine tank, spray irrigation equipment, 101.3 acres of forested spray irrigation, and 8 acres of pond dike available for spray irrigation (total 109.3 acres). There is also an 80-acre agricultural site that is in reserve for future irrigation if needed.

The facility is designed to treat a summer average wet weather (AWW) flow of 406,000 gallons per day (gpd) and a winter AWW flow of 199,000 gpd, with a carbonaceous biochemical oxygen demand ($CBOD_5$) strength of 175 milligrams per liter. The pond system consists of two aerated primary ponds and their secondary stabilization ponds. Aerated pond1 and aerated pond 1a each measure 2.6 acres and provide summer and winter combined detention times of 30 and 60 days respectively.

The aerated ponds also have a difference of 4 feet between maximum operating depth and minimum operating depth to provide 34 days of winter storage. Secondary pond 2 measures 10.12 acres with 5 feet of storage, secondary pond 3 measures 5.06 acres with 5 feet of storage, and secondary pond 4 measures 3.96 acres with 8 feet of storage (total of 19.14 acres). The pond system provides a total winter storage of 210 days at 199,000 gpd. Prior to spray irrigation, the treated wastewater is disinfected and then discharged on a controlled basis during the growing season to the spray irrigation sites.

c. Financial Status of Existing Utility System

i. Operation Costs

The wastewater system operates with no long-term debt. The Operations and Maintenance Cost increase each year, based on the flow increase. One of the largest costs in the wastewater budget is the utility cost which is $20,000 or more per year. Combined utility cost is estimated at $30,000 in 2023.

The wastewater system shares staff and about 2.5 Full Time Equivalent (FTE) are attributed to the wastewater system. This includes a 70 percent public works direct, a 50 percent assistant director and other staff.

ii. The history of the Operation and Maintenance Expense is listed below in Table-1

Table-1
Operations and Maintenance History

Audit Reports	**2021**	**2020**	**2019**
Personal Services	$ 197,171	$ 179,620	$ 163,860
Employee Benefits	$ 25,611	$ 36,138	$ 47,792
Professional Services	$ 2,919	$ 83,396	$ 16,425
Utilities	$ 22,952	$ 28,670	$ 34,808

Supplies	$ 23,396	$ 36,630	$ 24,055
Insurance	$ 6,398	$ 8,509	$ 9,214
Other services/Charges	$ 12,644	$ 10,973	$ 8,113
Total Disbursements	$ 291,091	$ 383,936	$ 304,267

iii. Revenue

The City of Breezy Point bills for wastewater services on a quarterly basis, after the quarter is completed. The base rate is $75 per unit, (EDU) or household. There is no water cost, as the City of Breezy Point does not have municipal water and they do not track use.

The fee to connect new users is $3,250. Commercial, or multi family users, are assigned a unit number when they originally hook up. Their hook up rate will then be based on the units they are assigned. i.e., a 10-unit business (ERU's) will be charged $32,250 to hook up.

Large commercial users consist of White Birch, Inc., a development company that owns the hockey arena, clinic, gold courses and a large resort. Another large commercial user is Narveson Properties, a timeshare management firm. Other commercial users include one restaurant, a hardware store, and a gas station.

Current customers who leave for the winter are discouraged from unhooking and re-hooking in the spring, as the rehook up rate is larger than the two quarterly payments.

D. PROJECT NEED

a. Issues and Needs with Existing Utility System

As mentioned in the Introduction, the primary need for this Facility Plan is the City looking proactively at its future flow projections and future WWTF (stabilization ponds and spray irrigation system) capacities.

i. Health, Sanitation and/or Security Concerns

The city has not had any health or sanitation concerns with their system. There have been isolated instances of people hunting foul and small game at the WWTF and has been brought to the attention of Law Enforcement. One improvement requested is to install perimeter fencing and electronic security gate.

ii. Aging Infrastructure

The City's began construction to the WWTF, sanitary sewer system, and control building in 1978. The control building, while still operational, is reaching the end of its lifecycle and has started to deteriorate; replacement should be a priority with any WWTF reconstruction project.

The current budget funds equipment repair and replacement costs. The expected yearly costs range from $20,000 to $100,000 for these repairs. Rehabilitation of two lift stations in 2023 was part of the maintenance program. Some of the larger infrastructure expenses

the city is planning for includes an additional pond, a new wastewater treatment control building, and storage building.

iii. Potential Growth

The DMR's show a growth of approximately 1.09% with a design cap of 74.1 MG. See Appendix D. Further evaluation shows the effluent irrigation values of 85% cap @ 63.3 MG and 100% cap @ 74.1 MG and correlate to years 2035 and 2051 respectively. With the 85% falling within the design period, and the 100% cap falls outside the 20-year design period, this should be monitored closely but no action will be needed at this time. The winter cap of 36.3 reaches the 85th and 100th percentile in 2044 and 2061 respectfully and falls outside the design parameters and doesn't require action at this time.

Using ERU growth history with an ERU design cap at 1604 and existing ERU's used at 1440 leaves 164 ERU's. Referring to Appendix D both the 85^{th} and 100^{th} percentiles fall within the design period. Projecting the ERU's to the design period leaves the need for 200 additional ERUs. There is an 85% winter influent cap in 2044 and with the winter storage capacity being the next critical factor in the growth projections, consideration should be made for the added volume of storage needed. Using 2043 ratio of the projected total influent of 53.07 MG and winter influent of 30.8 MG multiplied by the 2043 projected ERU's at 125 Gal/ERU/day leaves 5.30 MG of additional winter storage needed.

$$(30.8/53.07) \times 200 \text{ ERU} \times 125 \text{ GAL/ERU} \times 365 = 5.30 \text{ MG}$$

Developed areas with properties that have existing sanitary sewer and then have former seasonal residents and residents that retire and move to this area, permanently skew the population to ERU ratio which makes growth predictions variable for such situations. The above other predictive approaches should incorporate these occurrences.

E. WASTEWATER PROJECT ALTERNATIVES

After reviewing with Staff on the conditions of the "Headworks" along with yearly operational pond levels, ad after analyzing the previous flow and potential growth information, actual alternatives to consider were rather limited. Thus, we proceeded to what is presented in the "F" Selected Project section, below.

F. SELECTED PROJECT

a. Preliminary Project Design

After review of the data, it is recommended that additional storage be provided to accommodate the volume of influent anticipated to be generated within the design period.

i. As indicated in Appendix D, three design factors fall within the design period (2023 – 2043); 2030 85% ERU = 25 remaining, 2032 ERU capacity = 1604, and 2035 85% Irrigation = 63.3 MG. Falling outside the design period is the 85% Winter Storage in 2044 of 31.1 MG, Winter storage capacity in 2061 of 74.1 MG and Irrigation capacity in 2051 of 74.1 MG. This data shows that the critical path would be ERU capacity with Winter storage capacity being affected by the projected 200 additional ERU's needed in 2043. Using the ratio of Winter Influent/Total Influent for the amount winter storage is need for an additional 200 ERU's at 125 Gal per ERU is approximately 5.3 MG:

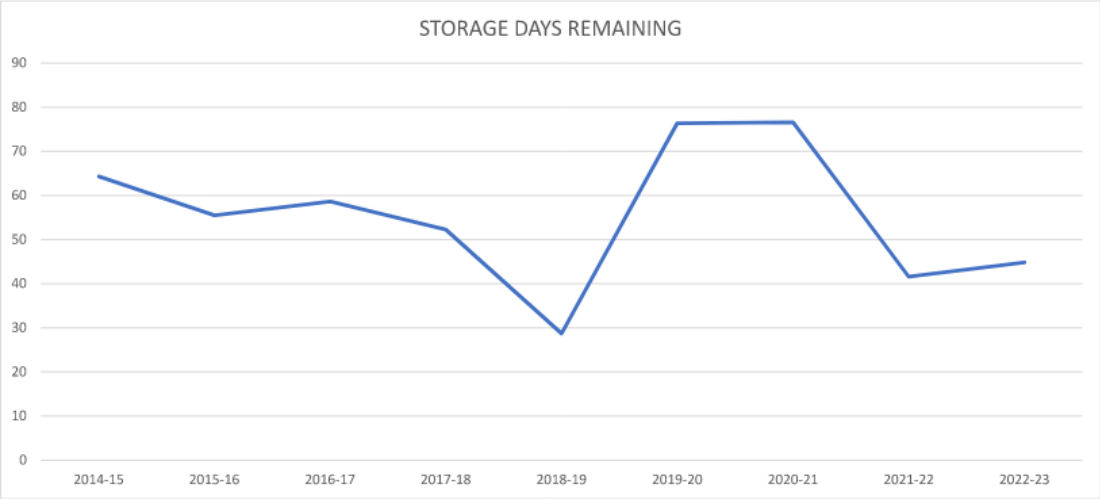
(30.8/53.07) x 200 ERU x 125 GAL/ERU x 365 = 5.30 MG

ii. An additional factor to consider is the difference between the design pond storage and the actual pond storage. Staff had indicated that the storage was starting to near its peak visually towards the end of the winter season. After a field survey, it was determined that the actual storage capacity didn't match the design capacity. The DMR Flow and Storage data were compared. See Figure C below. It shows that the trend for remaining days of storage was headed downward to 29 days in 2018-19 season just before COVID set in where the flow dipped down and additional remaining days of storage increased. In 2022-23 it appears that the trend downward towards lower storage capacity is starting to return back to before COVID days. Pond storage in later winter / early spring can swing somewhat rapidly depending on continued influent, precipitation, and the start of weather that would allow spray irrigation to begin. While this information alone might not provide full justification for a new pond, it is important information to help support the addition of a new storage pond.

Figure C

POND STORAGE SUMMARY

Year	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Average	
DMR Flow	21.60	20.63	22.92	25.28	22.88	19.48	20.26	19.56	19.55	21.35	
DMR Storage	22.16	24.21	25.32	22.16	31.29	19.84	18.75	25.48	25.67	23.87	
Diff	0.56	3.57	2.40	3.12	8.40	0.36	-1.51	5.92	6.11	3.22	
Storage Remaining	12.80	11.04	11.68	10.40	5.71	15.20	15.24	8.28	8.92	11.03	9.10
Avg Winter Flow	0.199	0.199	0.199	0.199	0.199	0.199	0.199	0.199	0.199	0.199	0.199
Storage Days Remaining	64	55	59	52	29	76	77	42	45	55	45.7



iii. Table 2 below was taken from Appendix E – Pond Storage Capacity – Pond 6 Sizing that shows the difference in volume of 5.2 MG. With the volume of the additional ERU's and the difference in volume of actual versus design, it is shown that a pond should be sized to accommodate those volumes at 10.5 MG. The hydraulic profile for proposed pond #6 can be seem from Appendix B – WWTF Flow Diagram and Hydraulic Profile.

Table 2:

Design vs Actual Pond Volume		
MG	Original MG	Loss MG
2.62	3.26	0.64
2.44	3.26	.82
13.85	16.5	2.65
7.1	8.25	1.15
9.73	9.68	-0.05
35.75	40.95	5.2

iv. The Control Building at the WWTF was constructed in 1978 (45 years) and has reached the end of the life cycle and dated equipment with nothing salvageable. There is also outdated compressor motors for aeration system that are not used and will be replaced with new aerators setup to rotate the primary ponds 1 and 1A. Additional items will

include bar screen, flume, lab space for PH/influent sampling, 2 workspaces, influent measuring devices, rag management, shower/bathroom, kitchenette, fridge, sink.

As noted earlier, security is not installed and proposed perimeter fencing and power gate. Other items include to repair transfer pipe from pond 1A to 1, replace hatches on control manholes with aluminum or plastic hatches, automatic pond measuring equipment along with an irrigation control system that will eventually control the entire system when it is to be upgraded.

The City presently houses equipment for the sewer department in a storage building adjacent to the City Hall that is being repurposed. Ideally, having the sewer equipment housed at the WWTF would be more efficient saving labor and travel time. The storage shed at the WWTF presently is not large enough to house the sewer truck, 50kw generator, jetter trailer, pipe rack, ranger, and various other equipment including 130 hp tractor, and does not have a heated area to work on equipment or work bench.

See Appendix G – Proposed Improvements, for a graphical depiction of most of the Proposed Improvements.

v. As flow increases over time, the spray irrigation area for discharging treated effluent will need to handle more water.

One approach to this is to remove the trees and use a cover crop that would take up more water than trees. Depending on the type of cover crop, there may need to be an investment to plant and harvest.

Another approach, and it may be in conjunction with the previous approach, is to expand the area of spray irrigation. This will require an investment in more irrigation piping and spray heads.

Timewise, as indicate in Appendix D and based on the anticipated growth rate, we are estimating the irrigation system would be at 85% capacity in the year 2035. This would be a time frame to plan improvements. While 11 years seems like a long-time frame now, in the world of public works improvements, this will come up quicker than everyone realizes.

Until specific above approaches, acreages, and details are determined, it is difficult to estimate a project cost. For budget purposes, it will most likely be at least $1 million.

b. Identify and Describe Permit Requirements

i. The City retains ownership for the additional area needed to construct the proposed 4.7-acre pond. Considerations to the long-eared-bat during tree removal will need to be taken, and Storm Water Pollution Prevention Plan (SWPPP) will need to be applied for.

c. Project Cost Estimate

A project cost estimate has been prepared and can be found in Appendix F - WWTP Proposed Improvements Preliminary Estimate.

In dealing with many wastewater system upgrades such as the ones presented in this report over the years, we understand that these kinds of infrastructure improvements cost a lot of money.

For budgeting purposes, we would round off the estimated project costs at $5 million.

Again, this is a Study level estimate. There has not been a final design performed yet. Once a final design is performed, project cost estimates are refined further.

Publicly bidding the improvements is really the only way to find the true cost of such improvements in the infrastructure improvement marketplace.

d. Estimated Annual Operating Budget
We will need to work with Staff and the City's financial consultant on an annual operating budget and these following sections.
   i. Necessary Income
   ii. Proposed (Post-Project) Annual Operation and Maintenance Costs
   iii. Existing and Proposed Debt Repayment
   iv. Reserves

In general, though, the City has been attempting to set aside monies for capital improvements.

G. CONCLUSIONS AND RECOMMENDATIONS

As indicated in Section "F," above, of this Report, we recommend the City initiate budgeting for improvements to the "Headworks" as well as the addition of another pond. This will include ancillary construction items, along with appropriate design phase engineering.

APPENDICES

APPENDIX A
Sanitary Sewer Collection System

EAGLEVIEW ELEMENTARY
BREEZY POINT ARENA
CAMPGROUND LS
WHITEBIRCH GOLF COURSE
CITY HALL
WASTEWATER TREATMENT FACILITY
WWTF
SKI CHALET DRIVE
AGATE WAY
NORTH STAR DR
RANCHETTE DRIVE
CSAH 11
WHITEBIRCH DRIVE
PAPPOOSE CIRCLE
SUFFOLK CIRCLE
OREEN CIRCLE
AIRPORT ROAD
BLUEBIRD LN
ROBIN LN
OSCEOLA CIRCLE
WREN DR
DOVE STREET
SPARROW DRIVE
EAGLE LANE
CANARY LN
ROBIN RED PINE DR
CENTER OF THE WORLD
OWL CIRCLE
BREEZY POINT DRIVE
BREEZY POINT BOULEVARD
LAKESHORE DRIVE
CHANNEL HEIGHTS
BAYVIEW PLACE
CIRCLE DR
SHOREVIEW LANE
WEAVERS POINT ROAD
WEAVERS POINT RD
APPLE LANE
DOUGLAS DR
ARNOLD PALMER DR
PALMER CT
GOPHER LN
FOX LOOP
N LAKEVIEW DR
CAMP LORA PL
N LAKEVIEW DR
N BIRCHWOOD DR
N PINEWOOD DR
N SPRUCE DR
PINEY WAY
THRONE DRIVE
EDGEWATER FARMS RD
EF-1
EF-2
EF-3
EF-4
EF-5
EF-6
S-1
S-2
S-3
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EWC-2
EWC-3
CSAH 4
CSAH 11

0 700 1400
SCALE (IN FEET)

V:\Projects\City of Breezy Point-32265\2019-10177\CADD\MAPPING\Sanitary Sewer Collection System-2020.dwg Plotted by:Nick Peterson 1/9/2024 11:18:00 AM © 2021 WIDSETH SMITH NOLTING

WIDSETH
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JOSEPH DUBEL DATE: 01/09/2024 LIC. NO. 45590

BY	REVISIONS DESCRIPTION	REV#	DATE

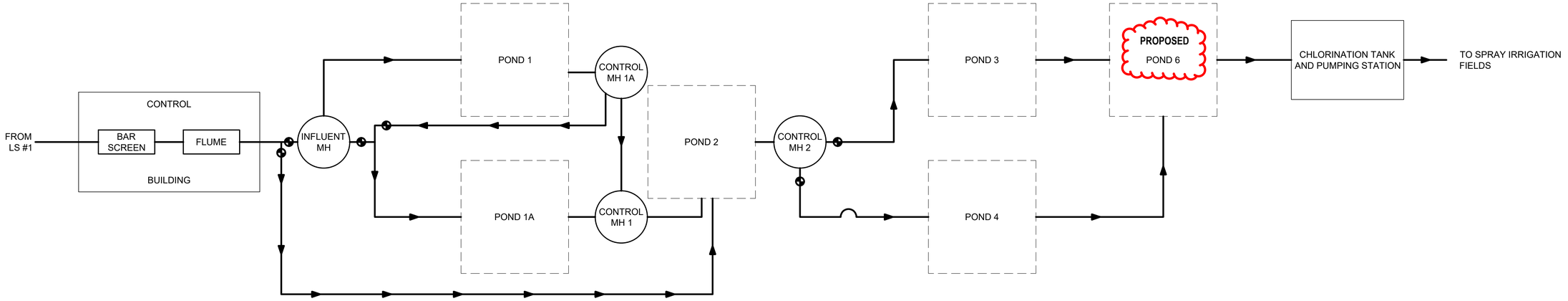
DATE: JANUARY, 2024
SCALE: AS SHOWN
DRAWN BY: NCP
CHECKED BY: JED
JOB NUMBER: 2022-11981

SANITARY SEWER COLLECTION SYSTEM MAP
CITY OF BREEZY POINT
CROW WING COUNTY, MINNESOTA
APPENDIX A

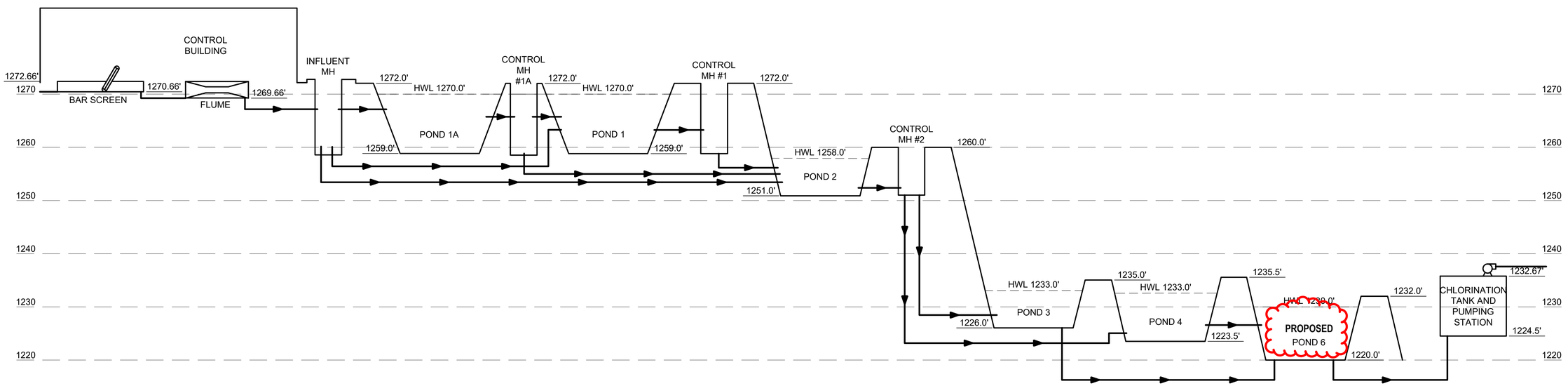
SHEET NO.
APPENDIX A

APPENDIX B
WWTF Flow Diagram and Hydraulic

APPENDIX B - WASTEWATER TREATMENT FACILITY
FLOW DIAGRAM AND HYDRAULIC PROFILE



FLOW DIAGRAM
NOT TO SCALE



HYDRAULIC PROFILE
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DATE: JUNE, 2011
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CHECKED BY: M.E.R.
JOB NUMBER 0145B0010.000

2023 WASTEWATER FACILITY STUDY
CITY OF BREEZY POINT
CROW WING COUNTY, MINNESOTA
SYSTEM SCHEMATIC

APPENDIX B

APPENDIX C
Pond Map

POND 1A

POND 1

POND 2

POND 3

POND 4

THRANE DRIVE

SPRAY IRRIGATION FIELDS

NORTH

0 150 300

SCALE (IN FEET)

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REV#	DATE	REVISIONS DESCRIPTION	BY

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CHECKED BY: NCP
JOB NUMBER: 2022-11991

2023 WASTEWATER FACILITY STUDY
CITY OF BREEZY POINT
CROW WING COUNTY, MINNESOTA

APPENDIX C

SHEET NO.

APPENDIX C

APPENDIX D
Flow, Population, ERUs Estimated Growth

APPENDIX D
ESTIMATED GROWTH
FLOW, POPULATION, ERU'S

			Design 36.3 MG		Design 74.1 MG			WWTP Estimate
		1.09%	1.94%	0.935%	2.077%	4.89%	1.89%	1604
		y = 0.2692x + 41.497	y = 0.3117x + 17.4		y = 0.7029x + 38.659	y = 82.857x + 1035.3	y = 17.301x + 1060.1	Avilable/(Needed)
	Year	Total Influent MG	Winter Influent	Summer Influent	Effluent Irrigation	Total Population	ERU's	ERU's
	1999	36.03	16.13	19.90				
	2000	37.36	14.30	23.06	36.20	979	967	
	2001	44.68	20.73	23.95	44.50	1,063	1,069	
	2002	46.32	21.20	25.12	42.04	1,151	1,106	
	2003	45.60	19.83	25.77	39.55	1,273	1,135	
	2004	43.97	19.74	24.23	27.82	1,373	1,200	
	2005	44.35	20.62	23.73	46.66	1,511	1,200	
	2006	42.15	19.56	22.59	39.22	1,642	1,200	
	2007	42.86	19.77	23.09	41.04	1,664	1,222	
	2008	43.25	19.54	23.71	49.15	1,774	1,230	
	2009	42.05	20.41	21.64	50.50	1,823	1,259	
	2010	44.24	20.74	23.50	47.41	2,346	1,259	
	2011	47.61	22.00	25.61	46.97	2,388	1,282	
	2012	51.09	23.64	27.45	50.50	2,394	1,301	
	2013	44.44	21.59	22.85	54.22	2,406	1,311	
	2014	46.66	20.61	26.05	59.93	2,408	1,320	
	2015	48.56	23.40	25.16	48.73	2,420	1,336	
	2016	49.82	23.24	26.58	54.98	2,436	1,353	
	2017	48.10	23.21	24.89	51.75	2,463	1,358	
	2018	47.18	23.21	23.97	53.92	2,485	1,369	
	2019	46.19	23.32	22.87	57.38	2,500	1,381	
	2020	43.02	23.63	19.39	40.27	2,574	1,410	
	2021	44.47	23.95	20.52	42.33	2,667	1,432	
	2022	46.70	24.26	22.44	58.08	2,858	1,440	164
Design Period	**2023**	**47.69**	**24.57**	**23.12**	**54.83**	**2,941**	**1,458**	**146**
	2024	47.96	24.88	23.08	55.53	3,024	1,475	129
	2025	48.23	25.19	23.03	56.23	3,107	1,493	111
	2026	48.50	25.50	22.99	56.93	3,190	1,510	94
	2027	48.77	25.82	22.95	57.64	3,272	1,527	77
	2028	49.03	26.13	22.91	58.34	3,355	1,545	59
	2029	49.30	26.44	22.86	59.04	3,438	1,562	42
ERU 85%	2030	49.57	26.75	22.82	59.75	3,521	1,579	25
	2031	49.84	27.06	22.78	60.45	3,604	1,596	8
ERU Design Cap	2032	50.11	27.37	22.74	61.15	3,687	1,614	(10)
	2033	50.38	27.69	22.69	61.85	3,770	1,631	(27)
	2034	50.65	28.00	22.65	62.56	3,852	1,648	(44)
Irrigation Cap 85%	2035	50.92	28.31	22.61	63.26	3,935	1,666	(62)
	2036	51.19	28.62	22.57	63.96	4,018	1,683	(79)
	2037	51.46	28.93	22.52	64.67	4,101	1,700	(96)
	2038	51.73	29.24	22.48	65.37	4,184	1,718	(114)

APPENDIX D
ESTIMATED GROWTH
FLOW, POPULATION, ERU'S

			Design 36.3 MG		Design 74.1 MG			WWTP Estimate
		1.09%	1.94%	0.935%	2.077%	4.89%	1.89%	1604
		y = 0.2692x + 41.497	y = 0.3117x + 17.4		y = 0.7029x + 38.659	y = 82.857x + 1035.3	y = 17.301x + 1060.1	Avilable/(Needed)
	Year	Total Influent MG	Winter Influent	Summer Influent	Effluent Irrigation	Total Population	ERU's	ERU's
	2039	52.00	29.56	22.44	66.07	4,267	1,735	(131)
	2040	52.27	29.87	22.40	66.78	4,350	1,752	(148)
	2041	52.53	30.18	22.35	67.48	4,432	1,769	(165)
	2042	52.80	30.49	22.31	68.18	4,515	1,787	(183)
Design Year	**2043**	**53.07**	**30.80**	**22.27**	**68.88**	**4,598**	**1,804**	**(200)**
					(30.8/53.07) x 200 ERU x 125 GAL/ERU x 365 = 5.30			MG
Winter Cap 85%	2044	53.34	31.11	22.23	69.59	4,681	1,821	(217)
	2045	53.61	31.43	22.18	70.29	4,764	1,839	(235)
	2046	53.88	31.74	22.14	70.99	4,847	1,856	(252)
	2047	54.15	32.05	22.10	71.70	4,930	1,873	(269)
	2048	54.42	32.36	22.06	72.40	5,012	1,891	(287)
	2049	54.69	32.67	22.01	73.10	5,095	1,908	(304)
	2050	54.96	32.99	21.97	73.80	5,178	1,925	(321)
Irrigation Cap 100%	2051	55.23	33.30	21.93	74.51	5,261	1,942	(338)
	2052	55.50	33.61	21.89	75.21	5,344	1,960	(356)
	2053	55.76	33.92	21.84	75.91	5,427	1,977	(373)
	2054	56.03	34.23	21.80	76.62	5,510	1,994	(390)
	2055	56.30	34.54	21.76	77.32	5,592	2,012	(408)
	2056	56.57	34.86	21.72	78.02	5,675	2,029	(425)
	2057	56.84	35.17	21.67	78.72	5,758	2,046	(442)
	2058	57.11	35.48	21.63	79.43	5,841	2,064	(460)
	2059	57.38	35.79	21.59	80.13	5,924	2,081	(477)
	2060	57.65	36.10	21.55	80.83	6,007	2,098	(494)
Winter Cap	2061	57.92	36.41	21.50	81.54	6,090	2,115	(511)
	2062	58.19	36.73	21.46	82.24	6,172	2,133	(529)

APPENDIX E
Pond Storage Capacity
Pond 6 sizing

APPENDIX E
POND STORAGE CAPACITY - POND 6 SIZING

Design Conditions

Pond	1	1A	2	3	4	TOTAL
Surface Area	2.60	2.60	10.12	5.06	3.96	24.34
Usable Depth	4.00	4.00	5.00	5.00	7.50	25.50
Acre feet available	10.40	10.40	50.60	25.30	29.70	126.40
MG	3.39	3.39	16.50	8.25	9.68	41.21

Actual Conditions

	Depth from Bottom	Bottom Not Used	Working Depth (WD)	Area Top WD	Area Bottom WD	Acre Feet	MG	Original MG	Loss MG
Pond 1A	10	6	4	2.24	1.78	8.05	2.62	3.26	0.64
Pond 1	10	6	4	2.10	1.65	7.50	2.44	3.26	0.82
Pond 2	7	2	5	9.14	7.87	42.52	13.85	16.5	2.65
Pond 3	7	2	5	4.67	4.04	21.78	7.10	8.25	1.15
Pond 4	10	2.5	7.5	4.55	3.41	29.87	9.73	9.68	-0.05
							35.75	40.95	5.20

Pond 1A	Bottom Pond Elev 1259.40		Pond 1	Bottom Pond Elev 1259.31		Pond 2	Bottom Pond Elev 1250.82
WD	Surface Area		WD	Surface Area		WD	Surface Area
0	51,477	1.2	0	46,080	1.1	0	323,589
1	55,256	1.3	1	50,124	1.2	1	332,098
2	59,552	1.4	2	54,309	1.2	2	342,825
3	63,949	1.5	3	58,580	1.3	3	353,653
4	68,449	1.6	4	62,954	1.4	4	364,583
5	73,050	1.7	5	67,429	1.5	5	375,614
6	77,752	1.8	6	72,006	1.7	6	386,747
7	82,557	1.9	7	76,685	1.8	7	397,980
8	87,462	2.0	8	81,466	1.9		
9	92,470	2.1	9	86,349	2.0		
10	97,579	2.2	10	91,334	2.1		

Pond 3	Bottom Pond Elev 1226.10		Pond 4	Bottom Pond Elev 1222.00		Proposed Pond 6	Bottom Pond Elev 1220.00			
WD	Surface Area		WD	Surface Area		WD	Surface Area	Acre	Acre Feet	MG
0	156,750	3.6	0	133,509	3.1	0	137,000	3.1	0	0.0
1	163,108	3.7	1	139,494	3.2	1	142,986	3.3	3.2	1.0
2	169,572	3.9	2	145,600	3.3	2	149,100	3.4	3.4	1.1
3	176,139	4.0	2.5	148,711	3.4	3	155,342	3.6	3.5	1.1
4	182,808	4.2	3	151,822	3.5	4	161,713	3.7	3.6	1.2
5	189,579	4.4	4	158,152	3.6	5	168,211	3.9	3.8	1.2
6	196,452	4.5	5	164,586	3.8	6	174,837	4.0	3.9	1.3
7	203,428	4.7	6	171,122	3.9	7	181,591	4.2	4.1	1.3
			7	177,760	4.1	8	188,473	4.3	4.2	1.4
			8	184,499	4.2	9	195,483	4.5	4.4	1.4
			9	191,341	4.4	10	202,622	4.7	4.6	1.5
			10	198,285	4.6					10.48
										Design MG
										10.50

APPENDIX F
WWTP Proposed Improvements
Preliminary Estimate

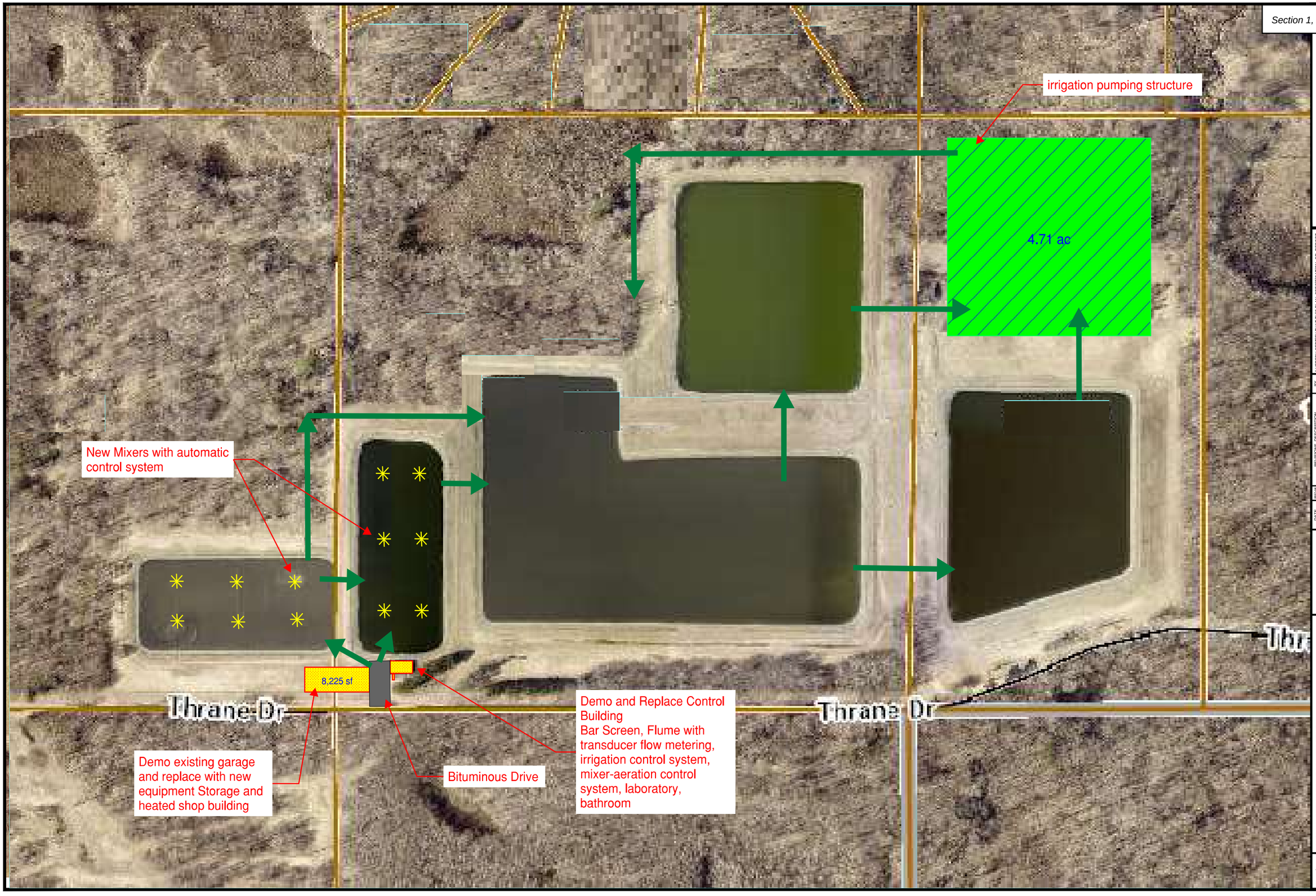
Appendix F - WWTP Proposed Improvements Preliminary Estimate

Item No.	Description	Unit	Quantity	Unit Price	Total
	General/Controls/Allowances				
1	Mobilization, Bonding, Insurance, Administrative (9%)	Lump Sum	1	$218,000.00	$218,000.00
2	Erosion Control Supervisor	Lump Sum	1	$1,500.00	$1,500.00
3	Rock Construction Access	Each	1	$2,500.00	$2,500.00
4	Silt Fence, Type MS	Lin. FT.	2,500	$4.50	$11,250.00
5	Site Restoration	Acre	10	$6,000.00	$60,000.00
6	Bio-Solids Removal - Existing Ponds Allowance	Gallon	500,000	$0.10	$50,000.00
7	Remove Existing Cell #1 Aeration System	Lump Sum	1	$8,000.00	$8,000.00
8	Salvage Existing Cell #1A Aerators	Each	6	$15,000.00	$90,000.00
9	Install Primary Cell 1 & 1A Aerators	Each	12	$15,000.00	$180,000.00
10	Clearing and Grubbing	Acre	7.0	$4,500.00	$31,500.00
11	Savage Existing Irrigation Turbine-Pumps	Each	2	$15,000.00	$30,000.00
12	Demo Existing Irrigation Structure	Each	1	$8,000.00	$8,000.00
13	Demo Existing Control Building	Each	1	$15,000.00	$15,000.00
14	Demo Existing Storage Structure	Each	1	$10,000.00	$10,000.00
15	Aggregate Surfacing, Class 5	Cu. Yd.	350	$35.00	$12,250.00
16	Bituminous Pavement	Ton	200	$125.00	$25,000.00
17	Aggregate Pavement Base Course, Class 5	Cu. Yd.	100	$35.00	$3,500.00
18	Aggregate Pavement Geotextile Fabric, Type 5	Sq. Yd.	300	$4.50	$1,350.00
19	Replace Existing Splitter Structure	Each	1	$45,000.00	$45,000.00
20	Aerators	Each	12	$10,000.00	$120,000.00
21	Common Excavation (P)	Cu. Yd.	45,000	$4.00	$180,000.00
22	Compact Pond Bottom	Each	1	$25,000.00	$25,000.00
23	Compaction and Material Testing	Each	20	$750.00	$15,000.00
24	Select Granular Fill Screened- PVC liner Bedding and Cover Material	Cu. Yd.	8,500	$15.00	$127,500.00
25	Synthetic Membrane Liner (40 Mill PVC)	Sq. Yd.	25,700	$7.50	$192,750.00
26	Geotextile Filter, Type III	Sq. Yd.	6,000	$3.00	$18,000.00
27	Riprap - MPCA Gradation	Cu. Yd.	1,770	$90.00	$159,300.00
28	Topsoil Excavation and Stockpile	Cu. Yd.	11,000	$3.00	$33,000.00
29	Place 9" Salvaged Topsoil	Cu. Yd.	11,000	$4.00	$44,000.00
30	Inlet/Outlet Concrete Base Pads	Each	2	$5,000.00	$10,000.00
31	Pond 5 Influent - 12" PVC/HDPE	Lin. FT.	210	$75.00	$15,750.00
32	Pond 5 Effluent - 12" C900 PVC/HDPE	Lin. FT.	150	$75.00	$11,250.00
33	Pond 5 Irrigation Control Structure with Chlorination Tank	Each	1	$45,000.00	$45,000.00
34	12" DIP Miscellaneous Piping	Lin. FT.	400	$200.00	$80,000.00
35	6" Gate Valve Irrigation	Lin. FT.	1	$2,500.00	$2,500.00
36	12" Gate Valve	Lin. FT.	5	$6,000.00	$30,000.00
37	Temporary Well for Cell Prefilling	Each	1	$20,000.00	$20,000.00
38	Water Balance Test	Each	1	$40,000.00	$40,000.00
39	6" Spray Irrigation Supply Piping	Lin. FT.	1,100	$75.00	$82,500.00
40	Existing Blower System Demolition	Lump Sum	1	$5,000.00	$5,000.00
41	Existing Control Building Demolition	Lump Sum	1	$20,000.00	$20,000.00
42	Existing Storage Building Demolition	Lump Sum	1	$10,000.00	$10,000.00
43	Control Building	SqFt	1,500	$175.00	$262,500.00
44	Storage Building (heated)	Lump Sum	8,225	$75.00	$616,875.00
45	Vertical Turbine Irrigation Pumps with VFD's	Each	2	$45,000.00	$90,000.00
46	Irrigation Mag Meter	EACH	1	$35,000.00	$35,000.00
47	Perimeter Fencing	Lin. FT.	9,400	$15.00	$141,000.00
48	Power Security Gate	Lump Sum	1	$15,000.00	$15,000.00
49	New 400 AMP Three Phase Electrical Service	Lump Sum	1	$35,000.00	$35,000.00
50	Irrigation Control System Modifications and Wiring	Lump Sum	1	$40,000.00	$40,000.00
SUBTOTAL CONSTRUCTION					**$3,324,775.00**

CONSTRUCTION CONTINGENCY (20%)	**$665,000.00**
PERMITS (0.5%)	**$17,000.00**
PLANS & SPECIFICATIONS (8%)	**$266,000.00**
CONSTRUCTION ADMINISTRATION /STARTUP/O&M MANUAL (10%)	**$332,000.00**
GEOTECHNICAL ENGINEERING / SOIL BORINGS (.5%)	**$17,000.00**
ADMINISTRATION / LEGAL (1.0%)	**$33,000.00**

ESTIMATED TOTAL CONSTRUCTION COST	**$4,654,775.00**

APPENDIX G
Proposed Improvements



WIDSETH
ARCHITECTS ▪ ENGINEERS ▪ SCIENTISTS ▪ SURVEYORS

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED #### UNDER THE LAWS OF THE STATE OF ####

LIC. NO. ####
DATE: ####
####

REVISIONS DESCRIPTION	BY

DATE	REV#

DATE: MAY 2024
SCALE: AS SHOWN
DRAWN BY: ####
CHECKED BY: ####
JOB NUMBER: 2022-11991

2023 WASTEWATER FACILITY STUDY
CITY OF BREEZY POINT
CROW WING COUNTY, MINNESOTA
APPENDIX G - PROPOSED IMPROVEMENTS

APPENDIX H
Environmental Information Worksheet

WIDSETH

Alexandria
610 Fillmore Street
Alexandria MN 56308

320.762.8149
Alexandria@Widseth.com
Widseth.com

ENVIRONMENTAL INFORMATION WORKSHEET

FOR

WASTEWATER FACILITY & SEWER SYSTEM EXPANSION

CITY OF BREEZY POINT, MINNESOTA

Prepared for:

CITY OF BREEZY POINT
ATTN: DAVID CHANSKI, CITY ADMINISTRATOR
8319 COUNTY RD 11
BREEZY POINT, MN 56472

January 2024

WIDSETH No. 2022-11991

Table of Contents

ENVIRONMENTAL INFORMATION WORKSHEET

FOR

WASTEWATER FACILITY & SEWER SYSTEM EXPANSION

CITY OF BREEZY POINT

JANUARY 2024

Prepared By:

Widseth
610 Fillmore Street
Alexandria, Minnesota 56308

Widseth Project No. 2022-11991

Certification:

I hereby certify that this report was prepared by me or under my direct supervision and that, to the best of my knowledge, the information provided is complete and accurate.

Signature: Daniel P. McInnis

Dan McInnis, Environmental Scientist

Widseth

Date: 01/15/2024

MINNESOTA POLLUTION CONTROL AGENCY
520 Lafayette Road North
St. Paul, MN 55155-4194

Environmental Information Worksheet (EIW) form

Clean Water State Revolving Fund Program

Minnesota Rule Chapter 7077.0272, subp. 2.a.F.
Minnesota Rule Chapter 7077.0277, subp. 3.E.

Doc Type: Wastewater Point Source

Eligible applicants seeking funds for clean water (stormwater and wastewater) projects through the Clean Water State Revolving Fund (commonly referred to as the CWSRF Program) are required by Minn. R. ch. 7077.0272, subp. 2.a. F. and Minn. R. ch. 7077.0277, subp. 3.E., to complete an Environmental Information Worksheet (EIW). This information will be used to assess environmental impacts, if any, caused by the project.

Questions: Contact Review Engineer or Bill Dunn at 651-757-2324 or bill.dunn@state.mn.us.

1. Project title: Wastewater Facility & Sewer System Expansion

2. Proposer: City of Breezy Point

Contact person: David Chanski

Title: City Administrator

Address: 8319 County Rd 11

Breezy Point, MN 56472

Phone: 218-569-1001

Fax: N/A

3. Project location: County: Crow Wing City/Twp: Breezy Point

___ 1/4 ___ 1/4 Section: 20, 21, 29 Township: 136N Range: 28W

Tables, Figures, and Appendices attached to the EIW:

- County map showing the general location of the project;
- United States Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable);
- Site plan showing all significant project and natural features.

4. Description:

a. Provide a project summary of 50 words or less.

The City of Breezy Point is proposing to expand their wastewater treatment facility (WWTF) to meet projected increases in demand. The proposed expansion will include construction of a new aerated stabilization cell and additional spray irrigation fields on 80 acres directly west and north of the existing cells.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

The City of Breezy Point in Crow Wing County (Figure 1) owns and operates a WWTF that utilizes a series of ponds to treat municipal wastewater to the point that it is suitable for disposal via forested spray irrigation fields adjacent to the ponds on City-owned property. The City's facility totals 263.7 acres and presently includes two aerated primary ponds (with a total area of 5.2 acres), three secondary stabilization ponds (total of 19.14 acres), 109.3 acres equipped for spray irrigation, and another 80 acres of land set aside for future expansion. The remaining area is a mix of lawn/landscaping, impervious surfaces, wetlands, and vacant land (forested and brush/grassland areas). The City is proposing to increase the treatment capacity of their WWTF through construction of a new aerated stabilization cell and additional spray irrigation fields to meet projected increases in demand and maintain compliance with discharge standards. The proposed Project Area is shown on Figure 2.

c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the proje its beneficiaries.

The current WWTF is beginning to near its capacity. According to the City's 2020 Comprehensive Plan, the population of Breezy Point grew by 3.8 percent from 2010 to 2020, and the City is expected to continue on this upward population trend. Wastewater flows generally correlate with increases in population. In order to continue operating and not exceed maximum capacity, the City of Breezy Point is looking to expand their WWTF to allow for future population growth within the City.

d. Are future stages of this development including development on any outlots planned or likely to happen? ☐ Yes ☒ No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

e. Is this project a subsequent stage of an earlier project? ☐ Yes ☒ No
If yes, briefly describe the past development, timeline and any past environmental review.

5. Project magnitude data

Total Project Area (acres) 263.7 or Length (miles) _____
Number of Residential Units: Unattached _____ Attached _____ maximum units per building _____
Commercial/Industrial/Institutional Building Area (gross floor space): total square feet 1501
Indicate area of specific uses (in square feet): _____

Office		Manufacturing	
Retail		Other Industrial	1501 (garage & pumphouse)
Warehouse		Institutional	
Light Industrial		Agricultural	
Other Commercial (specify)			

Building height _____ If over 2 stories, compare to heights of nearby buildings _____

6. Permits and approvals required. List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans, and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

Unit of government	Type of application	Status
MPCA	NPDES/SDS Construction Stormwater Permit	To be completed
MPCA	Modification of SDS permit	To be completed
USACE	Section 404 permit	To be completed
BWSR	Joint Application Form for Activities Affecting Water Resources in MN	To be completed

7. Land use. Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

As shown in Figure 3, current land use includes two aerated stabilization cells (Ponds 1 & 1A), three storage ponds (Ponds 2-4), forested spray irrigation fields, and vacant land.

8. Cover types. Estimate the acreage of the site with each of the following cover types before and after development:

	Before	After		Before	After
Types 1-8 wetlands	17.19	TBD	Lawn/landscaping	21.51	TBD
Wooded/forest	111.29	TBD	Impervious Surfaces	1.99	TBD
Brush/grassland	87.38	TBD	Other (describe)	24.34 (ponds)	TBD

Cropland	0	TBD			
			Total	263.7	263.7

9. Fish, wildlife, and ecologically sensitive resources.

a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

The USFWS's Information for Planning and Consultation (IPaC) system was utilized to determine if the Project has potential to negatively impact threatened or endangered species which are protected by the Endangered Species Act of 1973. The proposed Project received determinations of "no effect" or "not likely to adversely affect" for each of the threatened/endangered species listed as possibly occurring within the project area. No critical habitats for endangered or threatened species were identified within the project area. The IPaC species list and determination letters are included as Appendix A.

Forest habitat will be cleared for the construction of the WWTF pond and to increase efficiency of the spray irrigation fields, where it will be replaced by a cover crop. Only necessary trees that are in the immediate vicinity of the WWTF pond will be removed to create space for the pond. During construction, contractor will be required to control stormwater erosion to avoid impacts to any water bodies nearby.

b. Are any state (endangered or threatened) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site?
☒ Yes ☐ No
If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the Minnesota Department of Natural Resources (DNR) Natural Heritage and Nongame Research program has been contacted give the correspondence reference number: 2023-00489
Describe measures to minimize or avoid adverse impacts.

The Minnesota Department of Natural Resources National Heritage Review was received on August 31, 2023 (Appendix B). The Project Area falls within a Minnesota Biological Survey (MBS) Site of High Biodiversity Significance (Upper Cullen Lake; see Figure 4). In order to minimize disturbances to this ecologically significant area, some preventative actions need to be taken. Actions to minimize disturbance include:

1. minimizing vehicular disturbances in the MBS Site.

2. preventing parking of equipment or stockpiling supplies in undeveloped or unmaintaind parts of the MBS site.

3. preventing placement of spoil in undeveloped or unmaintained parts of the MBS site

4. Conduct work on frozen ground conditions

5. Use best management practices to prevent erosion and sediment control

6. Inspect and clean all equipment prior to bring it to the site to prevent the introduction and spread of invasive species

7. As much as possible, operate within already-disturbed areas

8. Revegetate disturbed soil with native species suitabale to the local habitat as soon after construction as possible.

9. Use only weed free mulches, topsoils, and seed mixes. Of particular concern are birdsfeet trefoil (Lotus corniculatus) and crown vetch (Coronilla varia), two invasive species that are sold commercially and are problematic in prairies and disturbed open areas.

Additionally, the project has the potential to impact Blanding's turtles (Emydoidea blandingii), a state-listed threatened species, through habitat disturbance/destruction due to construction activities. An avoidance plan is required and must provide a description of the project activities and construction methods, identify measures that will be taken to avoid take and minimize disturbance to the species, and include a map of disturbance areas.

10. Physical impacts on water resources. Will the project involve the physical or hydrologic alteration (dredging, filling, stream diversion, outfall structure, diking, and impoundment) of any surface waters such as a lake, pond, wetland, stream or drainage ditch? ☐ Yes ☒ No
If yes, identify water resource affected. Describe alternatives considered and proposed mitigation measures to minimize impacts. Give the DNR Protected Waters Inventory (PWI) number(s) if the water resources affected are on the PWI.

11. Water use. Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? ☐ Yes ☒ No
If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

12. Water-related land use management districts. Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ☒ Yes ☐ No
If yes, identify the district and discuss project compatibility with district land use restrictions.

The southeastern corner of the spray irrigation fields lies within a shoreland buffer zone. Treated water used in spray irrigation may run off through natural drainageways before discharge to surface waters according to the standards in Article 41 of the Crow Wing County Land Use Ordinance. WWTF impervious surface coverage does not exceed allowed amounts.

13. Water surface use. Will the project change the number or type of watercraft on any water body? ☐ Yes ☒ No
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

14. Erosion and sedimentation. Give the acreage to be graded or excavated and the cubic yards of soil to be moved: **2.6** Acres: **26417** cubic yards. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

Soils within the project area consist of four types: Eutrudepts, Graycalm, Rollins, and Rifle (Appendix C). Of these, the sandy Eutrudepts and Rollins soils have a severe erosion hazard rating due to steep slopes (10 to 20 percent) and high erodibility. These areas are shown in orange on the map in Appendix D. To prevent erosion to the extent practical, the Contractor will be required to remain in compliance with erosion and sediment control measures included in the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater Permit. Silt fence, sediment control logs, and other best management practices (BMPs) will be used to contain sediment onsite.

15. Water quality – surface-water runoff.

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any storm water pollution prevention plans.

There is potential for site runoff during construction and from the irrigation fields after the completion of the Project. Silt fencing, sediment control logs, and other BMPs will be used to prevent impacts to wetlands and surface waters as a result of stormwater runoff from the construction site. All disturbed areas will be restored to preconstruction conditions in a timely manner per MPCA regulations. In order to prevent large amounts of runoff, the irrigation equipment will be closely monitored. A Stormwater Pollution Prevention Plan (SWPPP) will be developed for the proposed improvements during the design phase of the proposed Project.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The lakes in the immediate vicinity are Pelican Lake and Upper Cullen Lake. Upper Cullen Lake appears to be at a higher elevation then the Project Area. Pelican Lake appears to be at the same elevation as the Project. Because Pelican Lake is at a lower elevation than Upper Cullen Lake, it is expected that Pelican Lake will be the main receiving water body from the Project.

The impact from runoff from the Project Area is anticipated to be insignificant due to the topography of the site, location in relation to the nearest waterbody and the establishment of vegetation onsite as quickly as possible.

16. Water quality – wastewater.

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

This Project includes improvements to the publicly owned City of Breezy Point wastewater system. Wastewater flow from the cities collection system to the WWTF is normal municipal domestic and commercial wastewater, there is no unusual wastewater produced in the city.

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

The existing liquid treatment train includes two aerated ponds followed by three storage ponds. These five ponds can be configured to be used in series or in parallel with each other. Upon receipt by the facility, larger solids are removed by a mechanically-cleaned bar screen and flow is measured by a Parshall flume. The treated wastewater is transferred to a chlorination tank and pumping station before being discharged to forested spray irrigation fields.

The WWTF has met discharge criteria as set forth in the City's National Pollutant Discharge Elimination System (NPDES) permit. Previous water quality data from a network of seven groundwater monitoring wells throughout the spray irrigation area show that the facility is functioning properly with high quality effluent used for irrigation.

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretr provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

The existing public owned WWTF is nearing its capacity. The proposed expansion to the current WWTF will be designed to treat the projected wastewater flows following the improvements to the system.

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

N/A

17. Geologic hazards and soil conditions.

a. Approximate depth (in feet) to Groundwater *2.5* minimum; *5* average.
Bedrock: *200* minimum; *310* average.

Describe any of the following geologic site hazards to groundwater and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

There are no known geological hazards near the proposed Project Area.

b. Describe the soils on the site, giving U.S. Soil Conservation Service (SCS) classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

A soils map from the NRCS Web Soil Survey website is attached (Appendix C). The soils in the proposed Project Area are mostly loamy sands and muck soils. The soils are in hydrologic soil group A (moderately course to course texture, with a high rate of water transmission), hydrologic soil group C (moderately fine to fine texture with a slow rate of water transmission), and hydrologic soil group A/D (very slow rate of water transmission for undrained areas). The contractor will be required to follow all MPCA requirements for fueling and any hazardous materials and liquid handling.

18. Solid wastes, hazardous wastes, storage tanks.

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

N/A

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

N/A

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

N/A

19. Traffic. Parking spaces added: *0* Existing spaces (if project involves expansion): *0*
Estimated total average daily traffic generated: *0* Estimated maximum peak hour traffic generated (if known) and its timing: *0* Provide an estimate of the impact on traffic congestion affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

The proposed Project will not impact existing traffic patterns after completion of construction. During the construction phase of this Project there will be temporary traffic impacts, The layout of the streets near the Project Area will allow for detours to be created around the Project Area.

20. Vehicle-related air emissions. Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *Environmental Assessment Worksheet (EAW) Guidelines* about whether a detailed air

quality analysis is needed.

N/A

21. Stationary source air emissions. Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing), any greenhouse gases (such as carbon dioxide, methane, and nitrous oxides), and ozone-depleting chemicals (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

N/A

22. Odors, noise, and dust. Will the project generate odors, noise or dust during construction or during operation? ☒ Yes ☐ No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

Construction activities are expected to generate noise and have the potential for dust. The contractor will be required to use best management practices and construction activities will be limited to daylight hours to mitigate noise and dust impacts.

Waste water treatment facilities have the potential for short term odor impacts during the spring. The waste water treatment ponds will be set back from residences and populated areas to avoid odor impacts.

23a. Nearby resources. Are any of the following resources on or in proximity to the site? Projects should search the Minnesota State Historic Preservation Office's (SHPO) National Register of Historic Places database.

***Note:** Project proposers must contact the SHPO at datarequestshpo@mnhs.org to request a database review to obtain information on any known historical or archaeological sites in the project area. Include a copy of correspondence with SHPO with the submittal of this EIW form.

a. Archaeological, historical, or architectural resources? ☒ Yes ☐ No
b. Prime or unique farmlands or land within an agricultural preserve? ☐ Yes ☒ No
c. Designated parks, recreation areas, or trails? ☐ Yes ☒ No
d. Scenic views and vistas? ☐ Yes ☒ No
e. Other unique resources? ☐ Yes ☒ No

If yes, describe the resource and identify any project-related impacts on the resources. Describe any measures to minimize or avoid adverse impacts.

SHPO database review identified one archaeological site and four historic properties in Section 21, Township 136N, Range 28W, and an additional two archaeological sites and thirteen historic properties in Section 28, Township 136N, Range 28W, which borders the Project Area to the southeast (Appendix E). Review of a Phase I Cultural Resources Investigation that was previously completed in 2008 for proposed improvements to County State Aid Highway (CSAH) 4 in Crow Wing County yielded the following conclusions:

1. Archaeological sites 21CW275 and 21CW277 do not meet National Registry of Historic Places (NRHP) significance criteria and were recommended as not eligible for listing in the NRHP. Site 21CW276 was recommended as potentially eligible for listing in the NRHP; however, this site is located approximately 0.55 miles east of the WWTF and would not be disturbed by the proposed expansion.

2. Historic properties consist primarily of summer cabins with no significant connection to any historical event, person, or trend. The cabins are also not architecturally distinguished in any way. These elements make them not eligible for listing in the NRHP. One commercial building (29073 CR 18), formerly the Edgewater Club, is also not eligible for listing in the NRHP.

Based on the NRHP status of the archaeological sites/historic properties and/or their proximity to the WWTF Project Area, no adverse impacts are anticipated as a result of the proposed expansion. No other unique resources were identified in close proximity to the Project Area.

23b. Section 106 Review (36 CFR 800) is required for all CWRF projects. The following forms can be found on the MPCA Wastewater and Stormwater Financial Assistance website at https://www.pca.state.mn.us/ppl. Select Clean Water Revolving Fund tab; then scroll to Facilities Plan and Facilities Plan Supplement for Wastewater Treatment Systems heading.

a. Project is exempt from review (attach completed *Exemption Checklist*) ☐ Yes ☒ No
b. Project is required to complete further Section 106 Review: ☒ Yes ☐ No
    a. SHPO
    b. Tribal consultation
    c. Other Consulting parties

24. Visual impacts. Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? ☐ Yes ☒ No

If yes, explain.

25. Compatibility with plans and land use regulations. Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? ☐ Yes ☒ No

If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

26. Impact on infrastructure and public services. Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? ☐ Yes ☒ No

If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

27. Cumulative impacts. Minn. R. 4410.1700, subp. 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts (or discuss each cumulative impact under appropriate item(s) elsewhere on this form).

The Project is a one time expansion of an existing WWTF. There is no cumulative impacts expected with this Project in the forseeable future.

28. Other potential environmental impacts. If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

No other adverse environmental impacts are anticipated within the scope of the Project.

29. Summary of issues. List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

No impacts that are listed above are anticipated to require additional investigation before the Project is begun.

Figures

FIGURE 1: COUNTY MAP

Breezy Point WWTF

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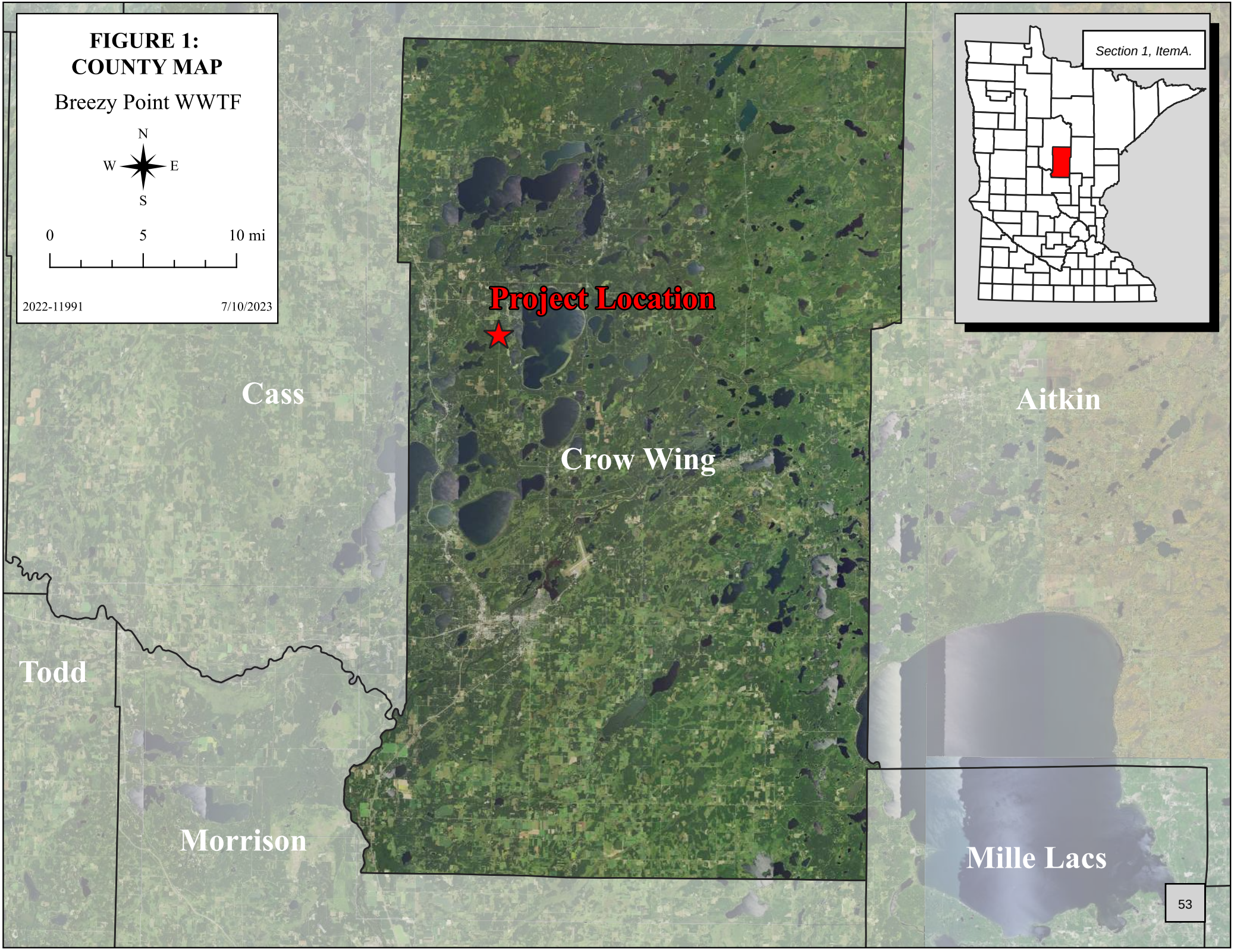
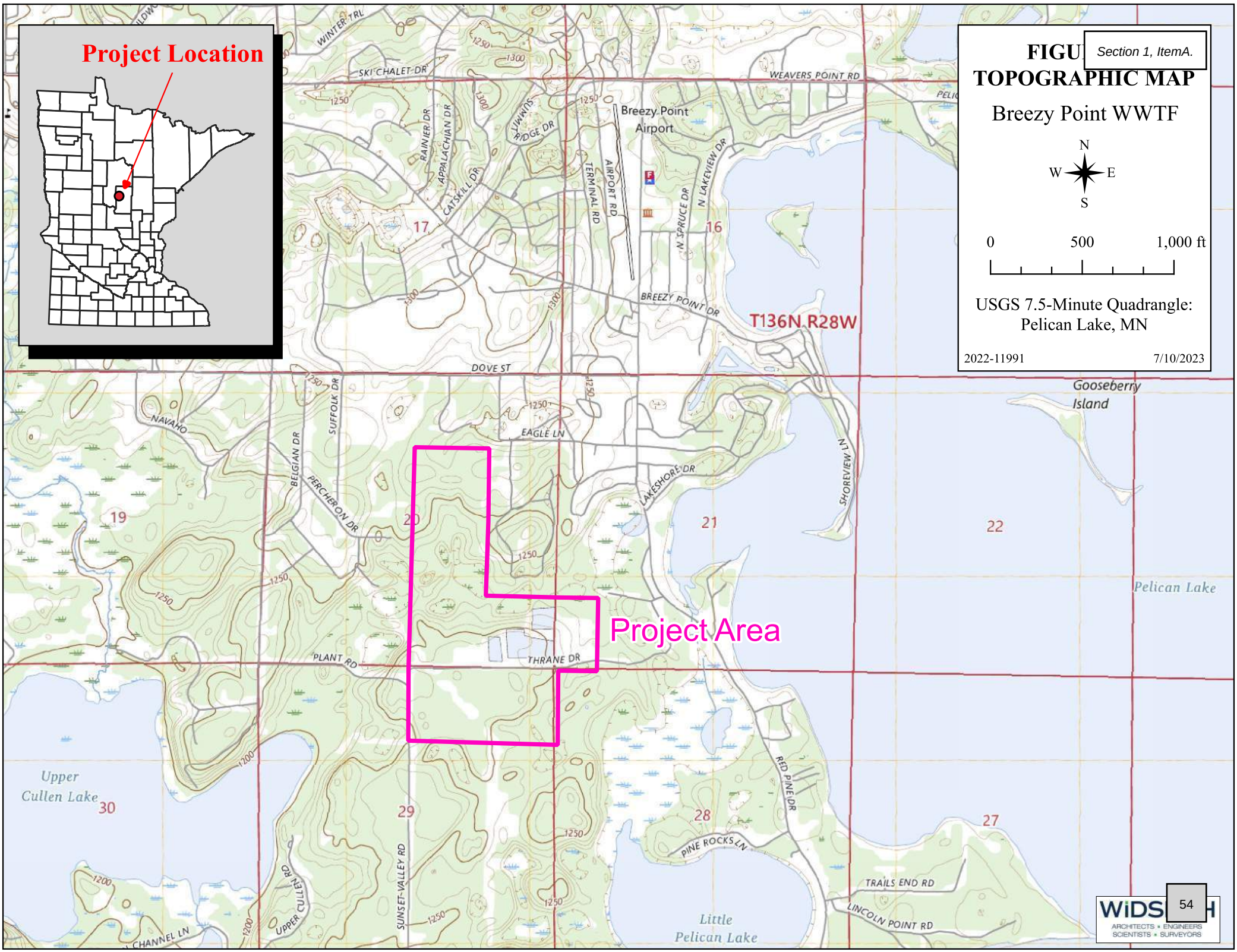
0 5 10 mi

2022-11991 7/10/2023




Project Location
FIGU
TOPOGRAPHIC MAP
Breezy Point WWTF
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500
1,000 ft
USGS 7.5-Minute Quadrangle:
Pelican Lake, MN
2022-11991
7/10/2023
Project Area
T136N.R28W
Breezy Point Airport
WINTER TRL
SKI CHALET DR
WEAVERS POINT RD
RAINIER DR
APPALACHIAN DR
CATSKILL DR
SUMMIT RIDGE DR
TERMINAL RD
AIRPORT RD
N SPRUCE DR
N LAKEVIEW DR
BREEZY POINT DR
DOVE ST
EAGLE LN
NAVAHO
BELGIAN DR
SUFFOLK DR
PERCHERON DR
LAKESHORE DR
SHOREVIEW LN
Gooseberry Island
Pelican Lake
PLANT RD
THRANE DR
RED PINE DR
PINE ROCKS LN
TRAILS END RD
LINCOLN POINT RD
SUNSET VALLEY RD
UPPER CULLEN RD
CHANNEL LN
Upper Cullen Lake
Little Pelican Lake
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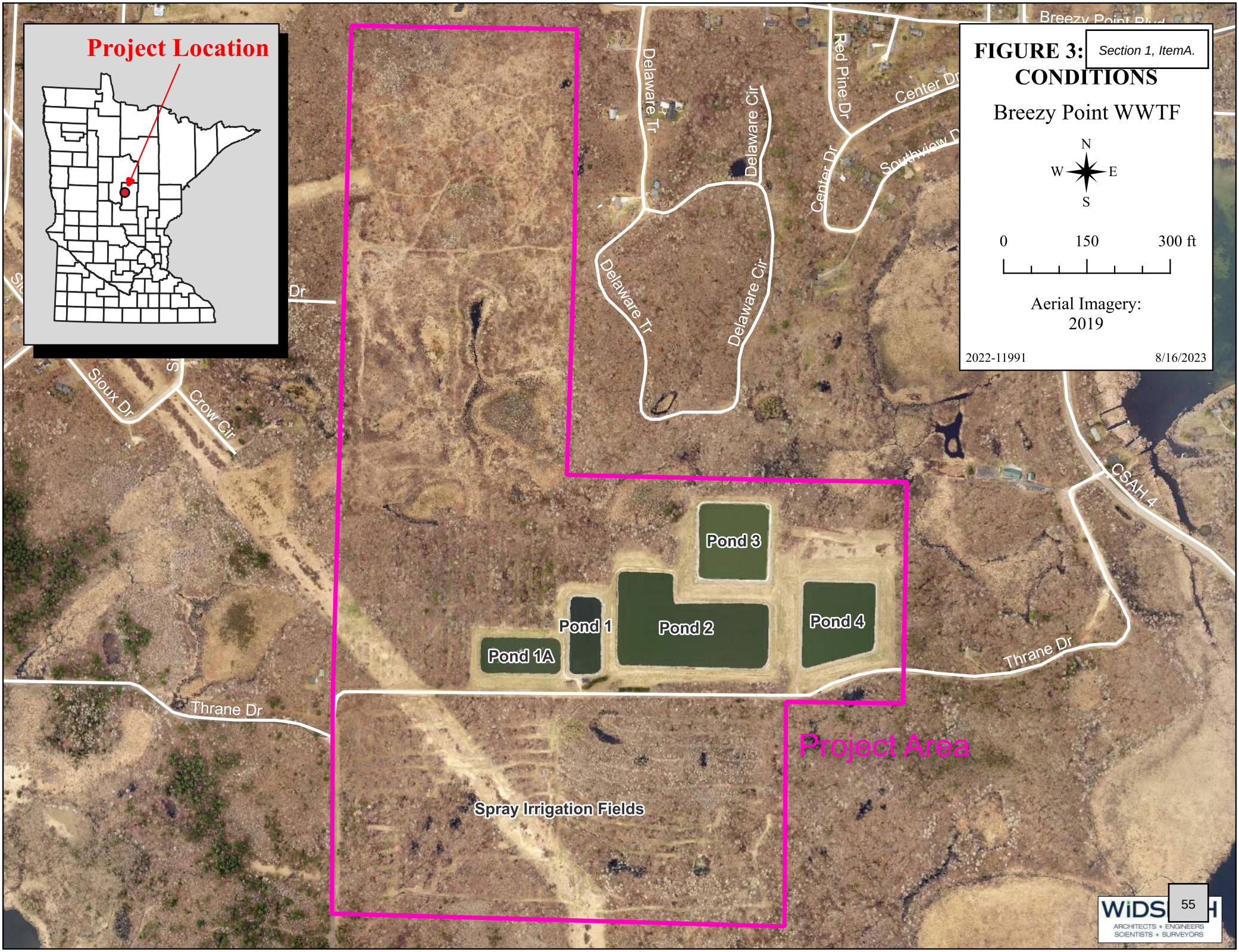

FIGURE 3: CONDITIONS

Breezy Point WWTF

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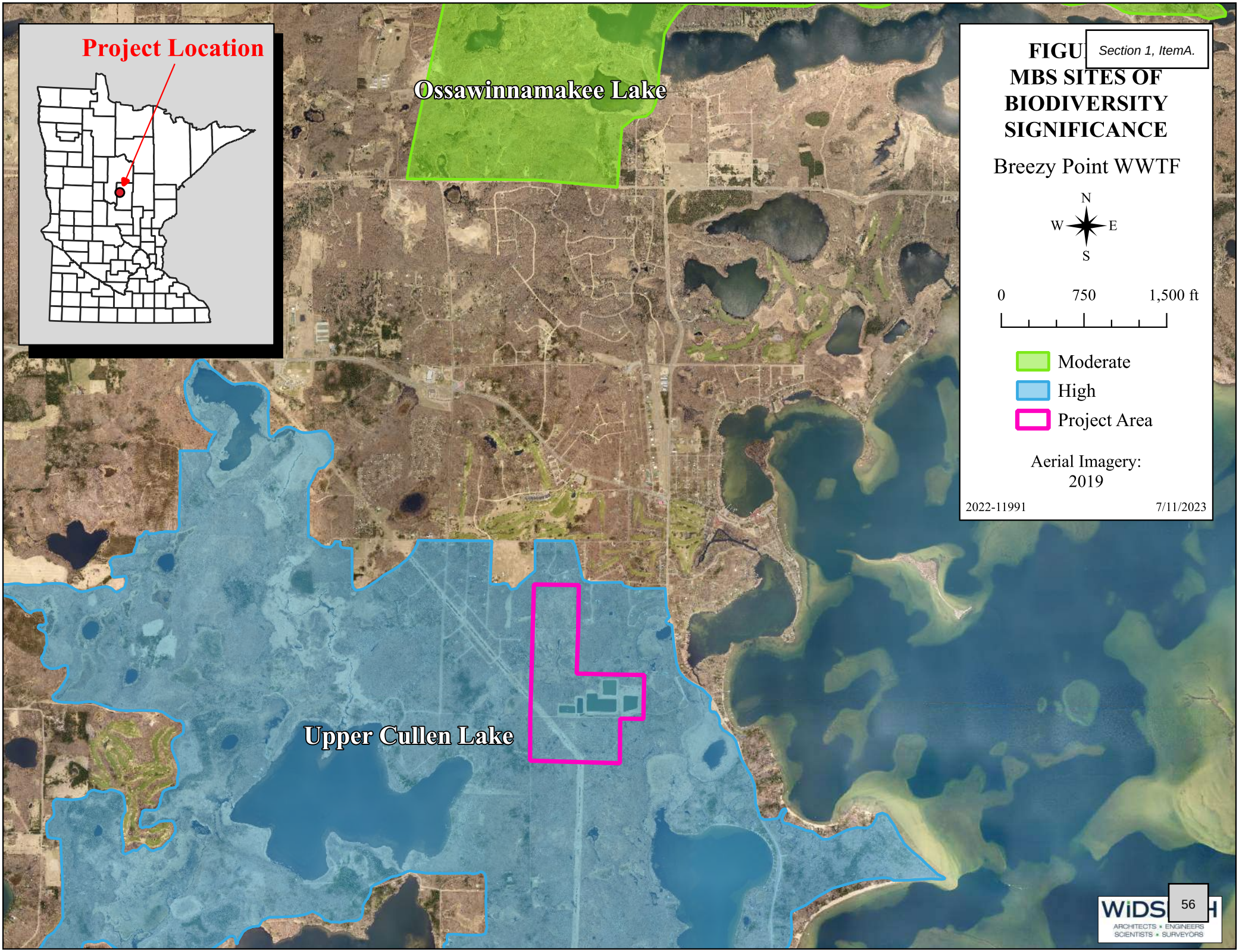
Aerial Imagery: 2019

2022-11991 8/16/2023

WIDSETH
ARCHITECTS • ENGINEERS
SCIENTISTS • SURVEYORS



FIGU MBS SITES OF BIODIVERSITY SIGNIFICANCE

Breezy Point WWTF

Appendix A

IPaC

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793 Fax: (952) 646-2873

In Reply Refer To: June 27, 2023
Project Code: 2023-0098418
Project Name: Breezy Point WWTF Expansion

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:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species
The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance
Please refer to refer to our Section 7 website for guidance and technical assistance, including step-by-step instructions for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A demonstration video showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect." In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. 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 Life History Information for Listed and Candidate Species on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats
Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

This species hibernates in caves or mines only during the winter. In Minnesota and Wisconsin, the hibernation season is considered to be November 1 to March 31. During the active season (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:

- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No**

Effect determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the range-wide northern long-eared bat D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/ Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys helps to determine if prohibited take might occur and, if not, will generate an automated verification letter.

Please note: On November 30, 2022, the Service published a proposal final rule to reclassify the northern long-eared bat as endangered under the Endangered Species Act. On January 26, 2023, the Service published a 60-day extension for the final reclassification rule in the Federal Register, moving the effective listing date from January 30, 2023, to March 31, 2023. This extension will provide stakeholders and the public time to preview interim guidance and consultation tools before the rule becomes effective. When available, the tools will be available on the Service's northern long-eared bat website (https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis). Once the final rule goes into effect on March 31, 2023, the 4(d) D-key will no longer be available (4(d) rules are not available for federally endangered species) and will be replaced with a new Range-wide NLEB D-key (range-wide d-key). For projects not completed by March 31, 2023, that were previously reviewed under the 4(d) d-key, there may be a need for reinitiation of consultation. For these ongoing projects previously reviewed under the 4(d) d-key that may result in incidental take of the northern long-eared bat, we recommend you review your project using the new range-wide d-key once available. If your project does not comply with the range-wide d-key, it may be eligible for use of the Interim (formal) Consultation framework (framework). The framework is intended to facilitate the transition from the 4(d) rule to typical Section 7 consultation procedures for federally endangered species and will be available only until spring 2024. Again, when available, these tools (new range-wide d-key and framework) will be available on the Service's northern long-eared bat website.

Whooping Crane

Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States."

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the

mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination
While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.

Minnesota
Minnesota Department of Natural Resources - Endangered Resources Review Homepage
Email: Review.NHIS@state.mn.us

Wisconsin
Wisconsin Department of Natural Resources - Endangered Resources Review Homepage
Email: DNRERReview@wi.gov

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
- 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:

Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

PROJECT SUMMARY

Project Code: 2023-0098418

Project Name: Breezy Point WWTF Expansion

Project Type: Wastewater Facility - New Construction

Project Description: The City of Breezy Point owns and operates a wastewater treatment facility (WWTF) that utilizes a series of ponds to treat municipal wastewater to the point that it is suitable for disposal via forested spray irrigation fields. The City's facility presently includes 109.3 acres equipped for spray irrigation, with another 80 acres set aside for future expansion. The City is proposing to increase the treatment capacity of their WWTF through construction of a new aerated stabilization cell and additional spray irrigation fields to meet projected increases in demand and maintain compliance with discharge standards.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@46.576966350000006,-94.23104383322607,14z

Counties: Crow Wing County, Minnesota

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 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.

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
Gray Wolf *Canis lupus* Population: MN There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4488	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

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

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.

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 should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

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)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list 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.	Breeds Dec 1 to Aug 31
Black Tern *Chlidonias niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20

NAME	BREEDING SEASON
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Common Tern *Sterna hirundo hirundo* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Aug 31
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20
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
Ruddy Turnstone *Arenaria interpres morinella* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	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 and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

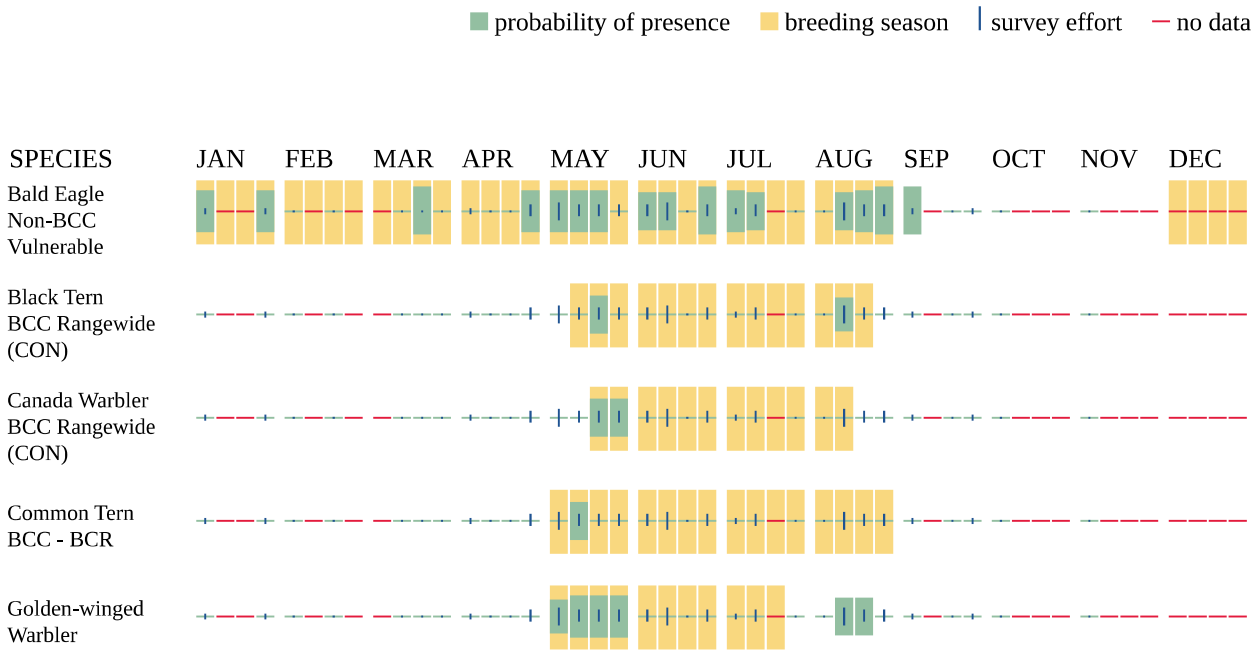
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

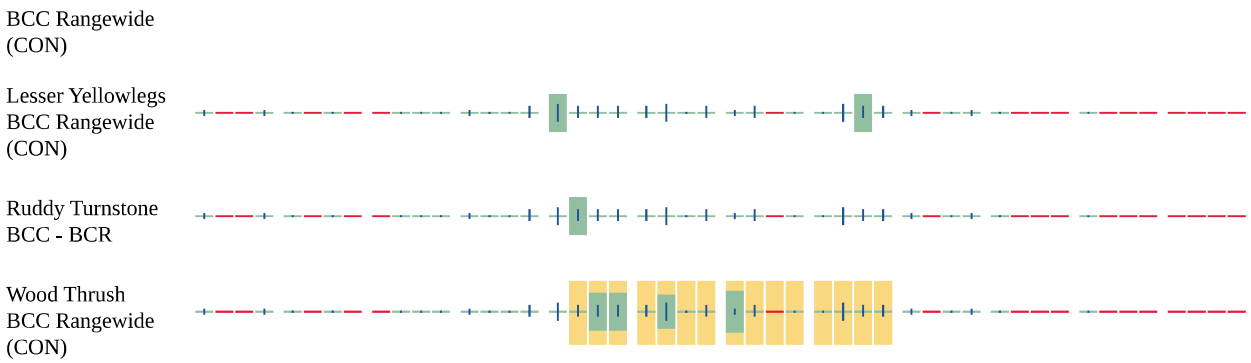
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- 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

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides

birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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.

FRESHWATER EMERGENT WETLAND

- PEM1A

FRESHWATER FORESTED/SHRUB WETLAND

- PFO4Dg
- PSS1/EM1D
- PSS1D
- PFO1C
- PSS3/EM1Dg
- PSS1C
- PSS1/3D
- PFO1A

FRESHWATER POND

- PUBKx
- PABH

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Danny Perrault
Address: 610 fillmore St.
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State: MN
Zip: 56308
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Phone: 3203355027

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793 Fax: (952) 646-2873

In Reply Refer To: June 27, 2023
Project code: 2023-0098418
Project Name: Breezy Point WWTF Expansion

Subject: Consistency letter for 'Breezy Point WWTF Expansion' for specified threatened and endangered species that may occur in your proposed project location consistent with the Minnesota-Wisconsin Endangered Species Determination Key (Minnesota-Wisconsin DKey).

Dear Danny Perrault:

The U.S. Fish and Wildlife Service (Service) received on **June 27, 2023** your effect determination(s) for the 'Breezy Point WWTF Expansion' (Action) using the Minnesota-Wisconsin DKey within the Information for Planning and Consultation (IPaC) system. You have submitted this key to satisfy requirements under Section 7(a)(2). The Service developed this system in accordance of with the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C 1531 et seq.).

Based on your answers and the assistance of the Service's Minnesota-Wisconsin DKey, you made the following effect determination(s) for the proposed Action:

Species	Listing Status	Determination
Gray Wolf (*Canis lupus*)	Threatened	NLAA
Monarch Butterfly (*Danaus plexippus*)	Candidate	No effect
Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered	No effect

Determination Information

Thank you for informing the Service of your "NLAA" determination(s). No further coordination is necessary for the species you determined may be affected, but not likely to be adversely affected, by the Action.

Additional Information

Sufficient project details: Please provide sufficient project details on your project homepage in IPaC (Define Project, Project Description) to support your conclusions. Failure to disclose important aspects of your project that would influence the outcome of your effects determinations may negate your determinations and invalidate this letter. If you have site-specific

information that leads you to believe a different determination is more appropriate for your project than what the Dkey concludes, you can and should proceed based on the best available information.

Future project changes: The Service recommends that you contact the Minnesota-Wisconsin Ecological Services Field Office or re-evaluate the project in IPaC if: 1) the scope or location of the proposed Action is changed; 2) new information reveals that the action may affect listed species or designated critical habitat in a manner or to an extent not previously considered; 3) the Action is modified in a manner that causes effects to listed species or designated critical habitat; or 4) a new species is listed or critical habitat designated. If any of the above conditions occurs, additional consultation with the Service should take place before project changes are final or resources committed.

For non-Federal representatives: Please note that when a project requires consultation under section 7 of the Act, the Service must consult directly with the Federal action agency unless that agency formally designates a non-Federal representative (50 CFR 402.08). Non-Federal representatives may prepare analyses or conduct informal consultations; however, the ultimate responsibility for section 7 compliance under the Act remains with the Federal agency. Please include the Federal action agency in additional correspondence regarding this project.

Species-specific information

Bald and Golden Eagles: Bald eagles, golden eagles, and their nests are protected under the Bald and Golden Eagle Protection Act (54 Stat. 250, as amended, 16 U.S.C. 668a-d) (Eagle Act). The Eagle Act prohibits, except when authorized by an Eagle Act permit, the "taking" of bald and golden eagles and defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." The Eagle Act's implementing regulations define disturb as "… to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

You indicate that your project **is** near a bald eagle nest. **If the Action may affect bald or golden eagles, additional coordination with the Service under the Eagle Act may be required.** For more information on eagles and conducting activities in the vicinity of an eagle nest, please visit our regional eagle website or contact Margaret at Margaret_Rheude@fws.gov. In addition, the Service developed the National Bald Eagle Management Guidelines (May 2007) to assist landowners in avoiding the disturbance of bald eagles.

In general, the guidelines recommend that disturbance of nesting eagles be avoided by (1) Keeping a distance between the activity and the nest (distance buffers), (2) Maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) Avoiding certain activities during the breeding season.

By adhering to the guidelines, landowners and project proponents should be able to avoid eagle disturbance most of the time. If avoiding disturbance is not possible, the project proponent may choose to apply for a take permit. A permit is not required to conduct any particular activity but is necessary to avoid potential liability for take caused by the activity.

The following species and/or critical habitats may also occur in your project area and **are not** covered by this conclusion:

- Northern Long-eared Bat *Myotis septentrionalis* Endangered

Coordination with the Service is not complete if additional coordination is advised above for any species.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Breezy Point WWTF Expansion

2. Description

The following description was provided for the project 'Breezy Point WWTF Expansion':

> The City of Breezy Point owns and operates a wastewater treatment facility (WWTF) that utilizes a series of ponds to treat municipal wastewater to the point that it is suitable for disposal via forested spray irrigation fields. The City's facility presently includes 109.3 acres equipped for spray irrigation, with another 80 acres set aside for future expansion. The City is proposing to increase the treatment capacity of their WWTF through construction of a new aerated stabilization cell and additional spray irrigation fields to meet projected increases in demand and maintain compliance with discharge standards.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@46.576966350000006,-94.23104383322607,14z

QUALIFICATION INTERVIEW

1. This determination key is intended to assist the user in evaluating the effects of their actions on Federally listed species in Minnesota and Wisconsin. It does not cover other prohibited activities under the Endangered Species Act (e.g., for wildlife: import/export, Interstate or foreign commerce, possession of illegally taken wildlife, etc.; for plants: import/export, reduce to possession, malicious destruction on Federal lands, commercial sale, etc.) or other statutes. Additionally, this key DOES NOT cover wind development, purposeful take (e.g., for research or surveys), communication towers that have guy wires or are over 450 feet in height, aerial or other large-scale application of any chemical (such as insecticide or herbicide), and approval of long-term permits or plans (e.g., FERC licenses, HCP's).

   Click **YES** to acknowledge that you must consider other prohibitions of the ESA or other statutes outside of this determination key.

   Yes
2. Is the action being funded, authorized, or carried out by a Federal agency?

   No
3. Are you the Federal agency or designated non-federal representative?

   No
4. Does the action involve the installation or operation of wind turbines?

   No
5. Does the action involve purposeful take of a listed animal?

   No
6. Does the action involve a new communications tower?

   No
7. Does the activity involve aerial or other large-scale application of ANY chemical, including pesticides (insecticide, herbicide, fungicide, rodenticide, etc)?

   No
8. Does the action occur near a bald eagle nest?

   Note: Contact the Minnesota or Wisconsin Department of Natural Resources for an up-to-date list of known bald eagle nests.

   Yes
9. Will your action permanently affect local hydrology?

   Yes

10. Does your project have the potential to impact the riparian zone or indirectly impact a stream/river (e.g., cut and fill; horizontal directional drilling; construction; vegetation removal; pesticide or fertilizer application; discharge; runoff of sediment or pollutants; increase in erosion, etc.)?

    Note: Consider all potential effects of the action, including those that may happen later in time and outside and downstream of the immediate area involved in the action.

    Endangered Species Act regulation defines "effects of the action" to include all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (50 CFR 402.02).

    Yes

11. Will your action disturb the ground or existing vegetation?

    Note: This includes any off-road vehicle access, soil compaction (enough to collapse a rodent burrow), digging, seismic survey, directional drilling, heavy equipment, grading, trenching, placement of fill, pesticide application (herbicide, fungicide), vegetation management (including removal or maintenance using equipment or prescribed fire), cultivation, development, etc.

    Yes

12. Will your action include spraying insecticides?

    No

13. Does your action area occur entirely within an already developed area?

    Note: Already developed areas are already paved, covered by existing structures, manicured lawns, industrial sites, or cultivated cropland, AND do not contain trees that could be roosting habitat. Be aware that listed species may occur in areas with natural, or semi-natural, vegetation immediately adjacent to existing utilities (e.g. roadways, railways) or within utility rights-of-way such as overhead transmission line corridors, and can utilize suitable trees, bridges, or culverts for roosting even in urban dominated landscapes (so these are not considered "already developed areas" for the purposes of this question). If unsure, select NO..

    No

14. Does the action area intersect with a known gray wolf denning or rendezvous area?

    No

15. Is there any potential for the action to harm wolves directly (e.g., mammal trapping, poison bait), or indirectly (e.g., increasing vehicle use that may result in vehicle strikes, exposure to potential human persecution)?

    No

16. [Hidden Semantic] Does the action area intersect the Threatened gray wolf AOI?

    Automatically answered

    Yes

17. [Hidden Semantic] Does the action area intersect the monarch butterfly species list area?

    Automatically answered
    Yes

18. Under the ESA, monarchs remain warranted but precluded by listing actions of higher priority. The monarch is a candidate for listing at this time. The Endangered Species Act does not establish protections or consultation requirements for candidate species. Some Federal and State agencies may have policy requirements to consider candidate species in planning. We encourage implementing measures that will remove or reduce threats to these species and possibly make listing unnecessary.

    If your project will have no effect on monarch butterflies (for example, if your project won't affect their habitat or individuals), then you can make a "no effect" determination for this project.

    Are you making a "no effect" determination for monarch?

    Yes

19. [Hidden semantic] Does the action intersect the Tricolored bat species list area?

    Automatically answered
    Yes

20. The tricolored bat was proposed for listing as endangered on September 13, 2022. During winter, tricolored bats hibernate in caves, abandoned mines, and abandoned tunnels ranging from small to large in size. During spring, summer and fall months, they roost primarily among leaf clusters of live or recently dead deciduous/hardwood trees.

    What effect determination do you want to make for the tricolored bat (Only make a "may affect" determination if you think the project is likely to jeopardize the continued existence of the species)?

    1. "No effect"

IPAC USER CONTACT INFORMATION

Agency: Private Entity
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State: MN
Zip: 56308
Email danny.perrault@widseth.com
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
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In Reply Refer To:
Project code: 2023-0098418
Project Name: Breezy Point WWTF Expansion

June 27, 2023

Federal Nexus: no
Federal Action Agency (if applicable):

Subject: Technical assistance for 'Breezy Point WWTF Expansion'

Dear Danny Perrault:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on June 27, 2023, for 'Breezy Point WWTF Expansion' (here forward, Project). This project has been assigned Project Code 2023-0098418 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project is not reasonably certain to cause incidental take of the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Gray Wolf *Canis lupus* Threatened
- Monarch Butterfly *Danaus plexippus* Candidate
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species and/or critical habitat listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

Next Steps

Coordination with the Service is complete. This letter serves as technical assistance. All conservation measures should be implemented as proposed. Thank you for considering federally listed species during your project planning.

We are uncertain where the northern long-eared bat occurs on the landscape outside of known locations. Because of the steep declines in the species and vast amount of available and suitable forest habitat, the presence of suitable forest habitat alone is a far less reliable predictor of their presence. Based on the best available information, most suitable habitat is now expected to be unoccupied. During the interim period, while we are working on potential methods to address this uncertainty, we conclude take is not reasonably certain to occur in areas of suitable habitat where presence has not been documented.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the Minnesota-Wisconsin Ecological Services Field Office and reference Project Code 2023-0098418 associated with this Project.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Breezy Point WWTF Expansion

2. Description

The following description was provided for the project 'Breezy Point WWTF Expansion':

> The City of Breezy Point owns and operates a wastewater treatment facility (WWTF) that utilizes a series of ponds to treat municipal wastewater to the point that it is suitable for disposal via forested spray irrigation fields. The City's facility presently includes 109.3 acres equipped for spray irrigation, with another 80 acres set aside for future expansion. The City is proposing to increase the treatment capacity of their WWTF through construction of a new aerated stabilization cell and additional spray irrigation fields to meet projected increases in demand and maintain compliance with discharge standards.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@46.576966350000006,-94.23104383322607,14z

DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of "may affect, but not likely to adversely affect" for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

   Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   No

2. Do you have post-white nose syndrome occurrence data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

   Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed acoustic detections. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

   No

3. Does any component of the action involve construction or operation of wind turbines?

   Note: For federal actions, answer 'yes' if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

   No

4. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   No

PROJECT QUESTIONNAIRE

IPAC USER CONTACT INFORMATION

Agency: Private Entity
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State: MN
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Phone: 3203355027

Appendix B
NHIS Letter

DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

August 31, 2023
Correspondence # MCE 2023-00489

Danny Perrault
Widseth Smith and Nolting and Associates, Inc.

RE: Natural Heritage Review of the proposed Breezy Point WWTF Expansion,
T136N R28W Sections 20-21, 28-29; Crow Wing County

Dear Danny Perrault,

As requested, the Minnesota Natural Heritage Information System has been reviewed to determine if the proposed project has the potential to impact any rare species or other significant natural features. Based on the project details provided with the request, the following rare features may be impacted by the proposed project:

Ecologically Significant Areas

- The Minnesota Biological Survey (MBS) has identified a Site of *High* Biodiversity Significance that encompasses the proposed project. Sites of Biodiversity Significance have varying levels of native biodiversity and are ranked based on the relative significance of this biodiversity at a statewide level. Sites ranked as *High* contain very good quality occurrences of the rarest species, high quality examples of the rare native plant communities, and/or important functional landscapes. The project area also includes mapped examples of six native plant communities. These are, with their state conservation rank

    - APn81 – Northern Poor Conifer Swamp, S4: Apparently Secure,
    - APn91 – Northern Poor Fen, S3: Vulnerable to Extirpation,
    - FDc34 – Central Dry-Mesic Pine-Hardwood Forest, S2: Imperiled,
    - FPn72a – Rich Tamarack Swamp (Eastcentral), S3: Vulnerable to Extirpation,
    - WFn74 – Northern Wet Alder Swamp, S3: Vulnerable to Extirpation,
    - WMn82 - Northern Wet Meadow/Carr, S4: Apparently Secure

We encourage you to consider project alternatives that would avoid or minimize disturbance to this ecologically significant area. Actions to minimize disturbance may include, but are not limited to, the following recommendations:

- Minimize vehicular disturbance in the MBS Site (allow only vehicles/equipment necessary for construction activities);
- Do not park equipment or stockpile supplies in undeveloped or unmaintained parts of the MBS Site;
- Do not place spoil in undeveloped or unmaintained parts of the MBS Site;
- If possible, conduct the work under frozen ground conditions;
- Use effective erosion prevention and sediment control measures;
- Inspect and clean all equipment prior to bringing it to the Site to prevent the introduction and spread of invasive species;
- As much as possible, operate within already-disturbed areas;
- Revegetate disturbed soil with native species suitable to the local habitat as soon after construction as possible; and
- Use only weed-free mulches, topsoils, and seed mixes. Of particular concern are birdsfoot trefoil (*Lotus corniculatus*) and crown vetch (*Coronilla varia*), two invasive species that are sold commercially and are problematic in prairies and disturbed open areas.

MBS Sites of Biodiversity Significance and DNR Native Plant Communities can be viewed using the Minnesota Conservation Explorer or their GIS shapefiles can be downloaded from the MN Geospatial Commons. Please contact the NH Review Team if you need assistance accessing the data. Reference the MBS Site Biodiversity Significance and Native Plant Community websites for information on interpreting the data.

- Pelican Lake has been identified as a Lake of *Outstanding* Biological Significance. Lakes of Biological Significance were ranked as *Outstanding, High, or Moderate* based on unique plant and animal presence. This particular lake has records of a rare fish species, the least darter (*Etheostoma microperca*), a species of special concern, and the shoreline between the proposed project and Pelican Lake has been designated as a Highly Sensitive Shoreline by the DNR. Direct effects to the lake and shoreline are unlikely but possible surface or groundwater movement may transport water high in nutrients that could affect these areas.

- If the Wetland Conservation Act (WCA) is applicable to this project, please note that wetlands within High or Outstanding MBS Sites of Biodiversity Significance or in Native Plant Communities ranked S1-S3 may qualify as “rare natural communities” under this Act. Minnesota Rules, part 8420.0515, subpart 3 states that a wetland replacement plan for activities that modify a rare natural community must be denied if the local government unit determines the proposed activities will permanently adversely affect the natural community. If the proposed project includes a wetland replacement plan under WCA, please contact your DNR Regional Ecologist for

further evaluation. For technical guidance on Rare Natural Communities, please visit WCA Program Guidance and Information.

State-listed Species

- Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, have been documented in the direct vicinity of the proposed project. Blanding's turtles use upland areas up to and over a mile distant from wetlands, waterbodies, and watercourses. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands. Factors believed to contribute to the decline of this species include collisions with vehicles, wetland drainage and degradation, and the development of upland habitat. Any added mortality can be detrimental to populations of Blanding's turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels.

  This project has the potential to impact this rare turtle through direct fatalities and habitat disturbance/destruction due to excavation, fill, and other construction activities associated with the project. Minnesota's Endangered Species Statute (*Minnesota Statutes*, section 84.0895) and associated Rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. **Given the project details and the potential for a take of a Blanding's turtle, an avoidance plan is required.**

  We do not currently have a template for avoidance plans. The plan needs to:

  - Provide a description of the project activities and construction methods,
  - Identify measures that will be taken to avoid take and minimize disturbance to the species, and
  - Include a map of disturbance areas. This can include a map of potential Blanding's turtle summer, winter, and nesting habitat overlayed with timing of project impacts.

  Measures to avoid or minimize disturbance include, but are not limited to, the following:

  - Avoidance of suitable habitat,
  - Timing the impacts to avoid incidental take,
  - The recommendations listed in the Blanding's turtle fact sheet,
  - Training for construction crew.

  Please submit the completed avoidance plan to the NH Review Team (Reports.NHIS@state.mn.us).

- Red-shouldered hawks (*Buteo lineatus*), a state-listed species of special concern, have been documented during the breeding season in the vicinity of the project. This species requires large, contiguous forest tracts interspersed with wetlands. We recommend, to the extent possible, the retention of forest cover to help maintain habitat connectivity to other forest tracts in the area.

Check any trees scheduled to be removed from April through July for active nests. If feasible, disturbance near active nests should be avoided during the critical nesting time, April and May. Please contact the Regional Nongame Specialist if any nests are discovered.

- The Natural Heritage Information System (NHIS) tracks bat roost trees and hibernacula plus some acoustic data, but this information is not exhaustive. Even if there are no bat records listed nearby, all seven of Minnesota's bats, including the federally endangered northern long-eared bat (*Myotis septentrionalis*), can be found throughout Minnesota. During the active season (approximately April-November) bats roost underneath bark, in cavities, or in crevices of both live and dead trees. Tree removal can negatively impact bats by destroying roosting habitat, especially during the pup rearing season when females are forming maternity roosting colonies and the pups cannot yet fly. To minimize these impacts, the DNR recommends that tree removal be avoided from June 1 through August 15.

- Please visit the DNR Rare Species Guide for more information on the habitat use of these species and recommended measures to avoid or minimize impacts. For further assistance with these species, please contact the appropriate DNR Regional Nongame Specialist or Regional Ecologist.

Federally Protected Species

- To ensure compliance with federal law, conduct a federal regulatory review using the U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) tool.

Environmental Review and Permitting

- Please include a copy of this letter and the MCE-generated Final Project Report in any state or local license or permit application. Please note that measures to avoid or minimize disturbance to the above rare features may be included as restrictions or conditions in any required permits or licenses.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location and project description provided with the request. If

project details change or the project has not occurred within one year, please resubmit the project for review within one year of initiating project activities.

The Natural Heritage Review does not constitute project approval by the Department of Natural Resources. Instead, it identifies issues regarding known occurrences of rare features and potential impacts to these rare features. Visit the Natural Heritage Review website for additional information regarding this process, survey guidance, and other related information. For information on the environmental review process or other natural resource concerns, you may contact your DNR Regional Environmental Assessment Ecologist.

Thank you for consulting us on this matter and for your interest in preserving Minnesota's rare natural resources.

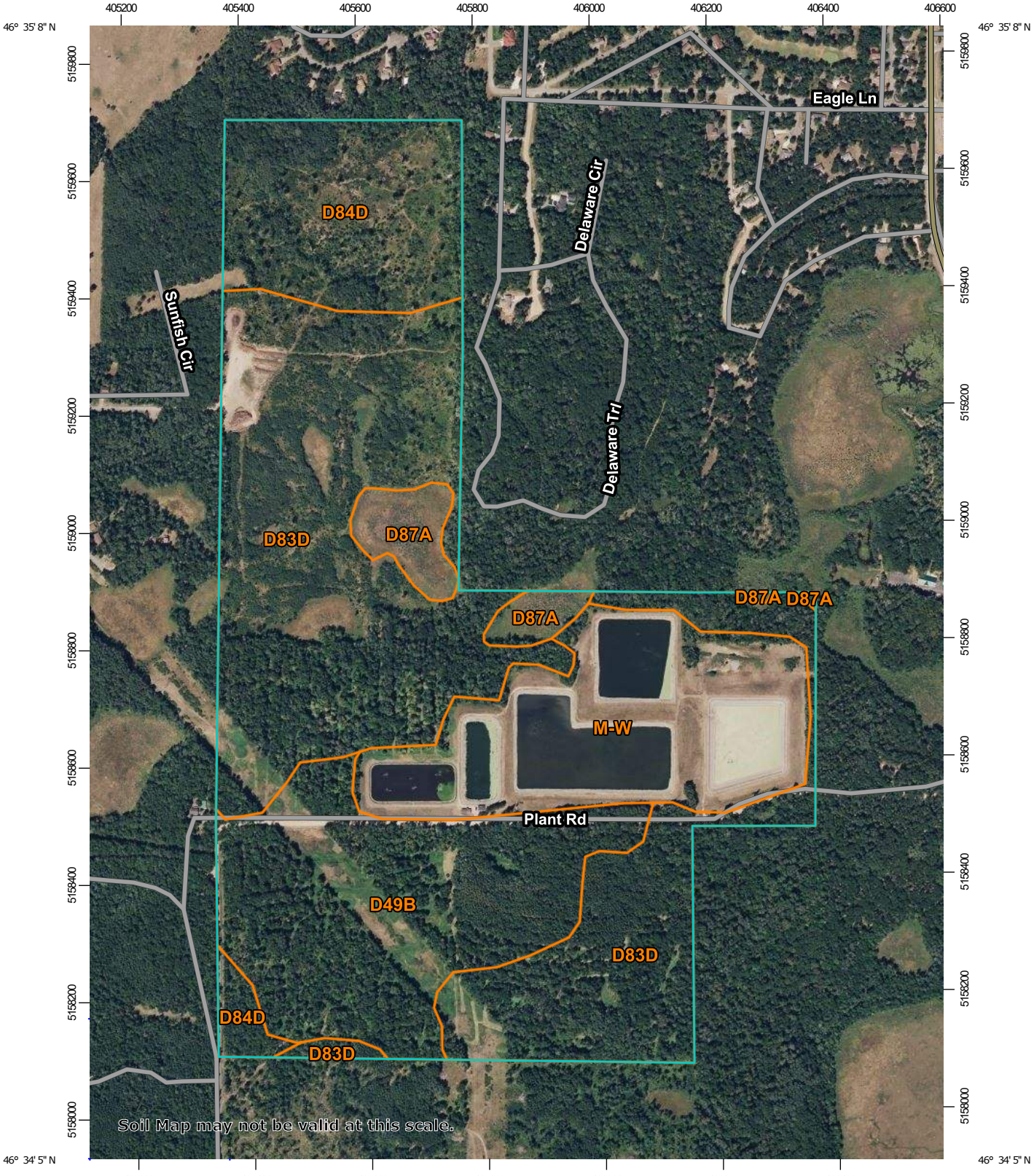
Sincerely,

James Drake
Natural Heritage Review Specialist
James.F.Drake@state.mn.us

Cc: Jessica Parson, Jennie Skanke, Mark White

Appendix C
Soil Map

Soil Map—Crow Wing County, Minnesota
(Breezy Point WWTF)



Map Scale: 1:9,410 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N 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 1:24,000.

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: Crow Wing County, Minnesota
Survey Area Data: Version 18, Sep 6, 2022

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

Date(s) aerial images were photographed: Jul 13, 2021—Aug 14, 2021

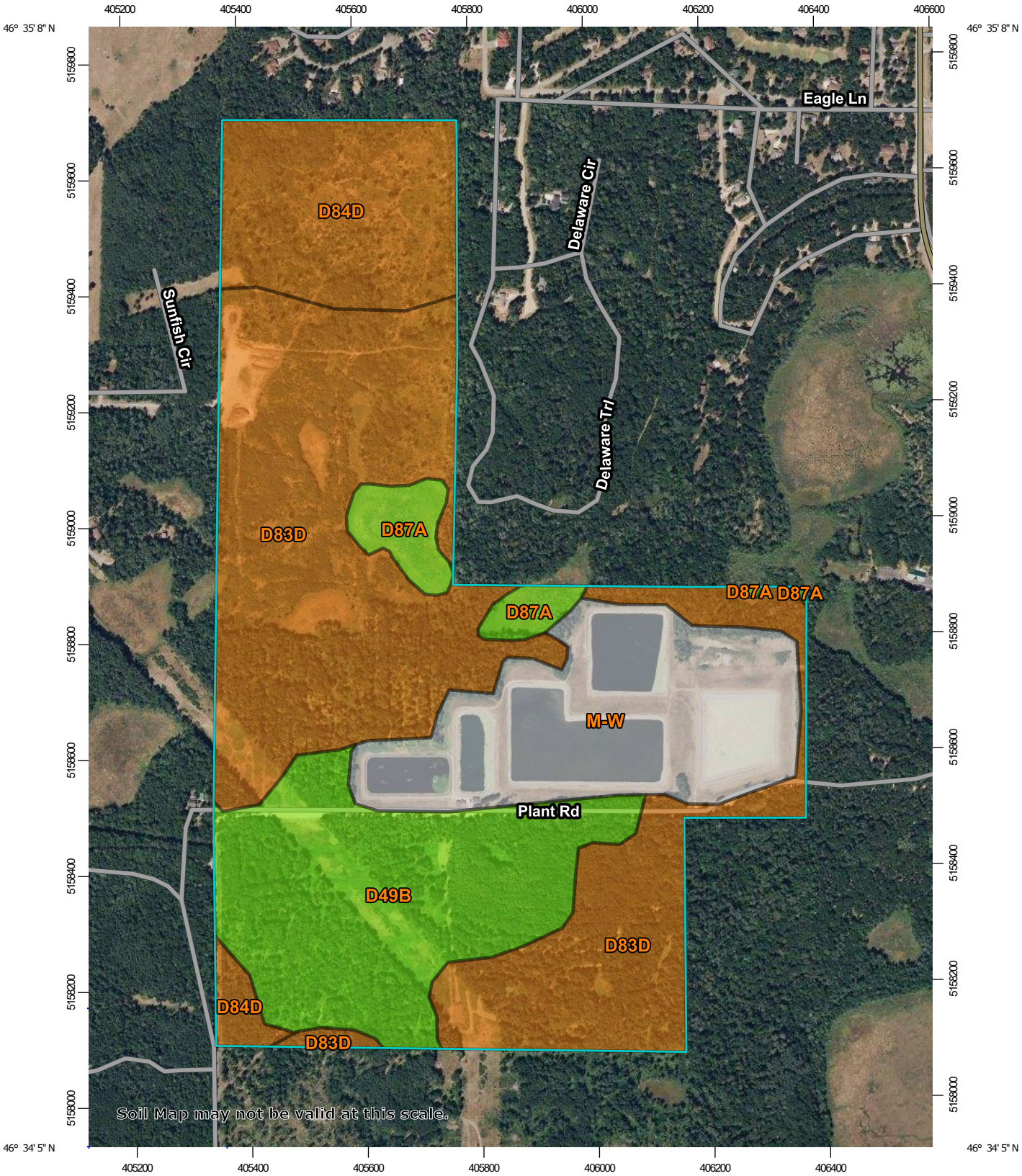
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
D49B	Graycalm loamy sand, 2 to 8 percent slopes	54.7	20.8%
D83D	Eutrudepts-Graycalm-Rollins complex, pitted, 10 to 20 percent slopes	117.1	44.4%
D84D	Eutrudepts-Graycalm-Rollins complex, 10 to 20 percent slopes	34.7	13.2%
D87A	Rifle-Rifle, ponded, complex, 0 to 1 percent slopes	9.2	3.5%
M-W	Water, miscellaneous	48.0	18.2%
Totals for Area of Interest		**263.7**	**100.0%**

Appendix D
Soil Erosion Hazard

Erosion Hazard (Road, Trail)—Crow Wing County, Minnesota
(Breezy Point WWTF)



Map Scale: 1:9,410 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

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

Soils

Soil Rating Polygons
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Lines
- Very severe
- Severe
- Moderate
- Slight
- Not rated or not available

Soil Rating Points
- Very severe
- Severe
- Moderate
- Slight
- 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 1:24,000.

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: Crow Wing County, Minnesota
Survey Area Data: Version 18, Sep 6, 2022

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

Date(s) aerial images were photographed: Jul 13, 2021—Aug 14, 2021

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.

Erosion Hazard (Road, Trail)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
D49B	Graycalm loamy sand, 2 to 8 percent slopes	Slight	Graycalm (90%)		54.7	20.8%
			Graycalm, nearly level (10%)			
D83D	Eutrudepts-Graycalm-Rollins complex, pitted, 10 to 20 percent slopes	Severe	Eutrudepts, sandy (30%)	Slope/erodibility (0.95)	117.1	44.4%
			Rollins (20%)	Slope/erodibility (0.95)		
D84D	Eutrudepts-Graycalm-Rollins complex, 10 to 20 percent slopes	Severe	Eutrudepts, sandy (30%)	Slope/erodibility (0.95)	34.7	13.2%
			Rollins (20%)	Slope/erodibility (0.95)		
D87A	Rifle-Rifle, ponded, complex, 0 to 1 percent slopes	Slight	Rifle (55%)		9.2	3.5%
			Rifle, ponded (45%)			
M-W	Water, miscellaneous	Not rated	Water, miscellaneous (100%)		48.0	18.2%
Totals for Area of Interest					**263.7**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Severe	151.9	57.6%
Slight	63.9	24.2%
Null or Not Rated	48.0	18.2%
Totals for Area of Interest	**263.7**	**100.0%**

Description

FOR - Forestry

The ratings in this interpretation indicate the hazard of soil loss from unsurfaced roads and trails. The ratings are based on soil erosion factor K, slope, and content of rock fragments.

The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," or "severe." A rating of "slight" indicates that little or no erosion is likely; "moderate" indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and "severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

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 specified aspect of forestland management (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 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.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix E
SHPO Database Results

COUNTY	SITENUM	SITENAME	TOWNSHIP	RANGE	SECTION	XQUARTERS	ACRES	WORKTYPE	DESCRIPT	TRADITION	CONTEXT	ReportNum	Natreg	CEF	DOE
Crow Wing															
	21CW0275		136	28	21	SW-NE-SW	0.1	1	SA						
	21CW0276		136	28	28	NE-SE-NW-NE	0.1	1	LS						
	21CW0277	Bair	136	28	28	NW-NE-SE-SE	0.1	1	SA						

COUNTY	CITYTWP	PROPNAME	ADDRESS	TOWNSHIP	RANGE	SECTION	QUARTERS	USGS	REPORTNUM	NRHP	CEF	DOE	INVENTNUM
Crow Wing													
	Pelican Twp.												
		summer cabin	28077 CR 18	136	28	28	SW-SE-NE	Pelican Lake	CW-2008-1W				CW-PEL-011
		summer cabin	28083 CR 18	136	28	28	SW-SE-SE	Pelican Lake	CW-2009-1H				CW-PEL-012
		summer cabin	28111 CR 18	136	28	28	SW-SE-SE	Pelican Lake	CW-2008-1H				CW-PEL-013
		summer cabin	28163 CR 18	136	28	28	NW-SE-SE	Pelican Lake	CW-2008-1H				CW-PEL-014
		summer cabin	28177 CR 18	136	28	28	NW-SE-SE	Pelican Lake	CW-2008-1H				CW-PEL-015
		summer cabin	28233 CR 18	136	28	28	NW-SE-SE	Pelican Lake	CW-2008-1H				CW-PEL-016
		summer cabin	28283 CR 18	136	28	28	SW-NE-SE	Pelican Lake	CW-2008-1H				CW-PEL-017
		summer cabin	28301 CR 18	136	28	28	SW-NE-SE	Pelican Lake	CW-2008-1H				CW-PEL-018
		summer cabin	28339 CR 18	136	28	28	SW-NE-SE	Pelican Lake	CW-2008-1H				CW-PEL-019
		summer cabin	9483 Ridgeview Lane	136	28	28	SW-NE-SE	Pelican Lake	CW-2008-1H				CW-PEL-020
		summer cabin	9479 Ridgeview Lane	136	28	28	SW-NE-SE	Pelican Lake	CW-2008-1H				CW-PEL-021
		summer cabin	9465 Ridgeview Lane	136	28	28	SW-NE-SE	Pelican Lake	CW-2008-1H				CW-PEL-022
		summer cabin	9275 Mockingbird Lane	136	28	28	SW-SE-NE	Pelican Lake	CW-2008-1H				CW-PEL-023
		summer cabin	29030 CR 18	136	28	21	SW-SW-SE	Pelican Lake	CW-2008-1H				CW-PEL-024
		summer cabin	29050 CR 18	136	28	21	SW-SW-SE	Pelican Lake	CW-2008-1H				CW-PEL-025
		building	29073 CR 18	136	28	21	SW-SW-SE	Pelican Lake	CW-2008-1H				CW-PEL-026
		summer cabin	29641 Apen Lane	136	28	21	SW-SE-NW	Pelican Lake	CW-2008-1H				CW-PEL-027

Appendix F
Section 106 Exemption Checklist

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

Section 106 Review Exemption Checklist

Clean Water State Revolving Fund Program
Wastewater and Stormwater Projects
(36 CFR Part 800)

Doc Type: Wastewater Point Source

Instructions: If at least one of the "**Yes**" statements is checked, the project is considered to have completed these requirements and is not required to submit additional information to meet the provisions of the Section 106 review.

If the answer to all of the statements is "**No**", the project will be required to submit additional information to meet the provisions of the Section 106 review.

Project information

Project name: Breezy Point Wastewater Facility

MPCA Review engineer: _____ MPCA project number: _____

Exempt criteria	Yes	No
1. The project is limited to environmental study.	☐	☒
2. The project is limited to planning and design.	☐	☒
3. The project is for emergency/disaster relief and/or protection.	☐	☒
4. The project is limited to minor modifications to an existing treatment facility which is less than 45 years old.	☐	☒
5. The project is limited to modifications within existing buildings or treatment components.	☐	☒
6. The project is limited to collection system rehabilitation/replacement in previously disturbed soil with no major extension/expansion in undisturbed soil.	☐	☒
7. The project is limited to sanitary sewer lining.	☐	☒
8. The project is limited to installation of a generator to provide backup power in emergency situations.	☐	☒

If "Yes" to any of 1- 8 above, please provide a brief written description of the project and complete the Certification Statement below.

Certification statement

We certify that the information provided on this form is complete and accurate and that this project meets the exempt criteria established by Minnesota Pollution Control Agency.

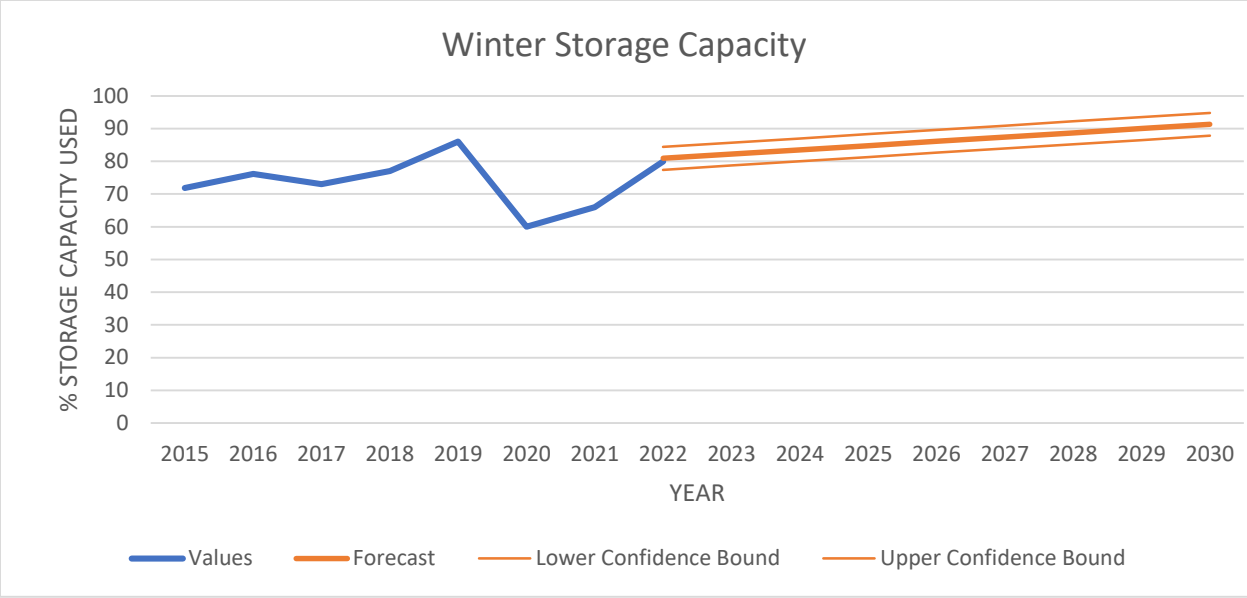
Project authorized official or Design engineer

Print name: Joe Dubel, PE

Organization: Widseth

Signature: Joseph E. Dubel

Date (mm/dd/yyyy): 01/15/2024



Percent of Pond Winter Storage Capacity Used

- 2011 study predicted 85% pond capacity in 2023, 100% pond capacity in 2037
- City staff expects 85% pond capacity in less than 5 years
- City staff expects 100% pond capacity in approximately 10 years
- Existing city property may hinder pond size or location and additional property may be necessary for pond storage
- Winter storage capacity tracking is relatively recent, making the predictive utility of the data less valuable

Name of Organization	City of Breezy Point	City of Crosslake	City of East Gull Lake	City of Lakeshore	City of Pequot Lakes	City of Nisswa
2023 Effluent Total in Millons of Gallons	53.387	21.354	NA	7.5	25.452	41.12
Debt	$0	$2,250,000	NA	$242,850	NA	$4,556,000
Cash Reserves	$3,700,000.00	$0	NA	$26,364	NA	$1,750,000
Connection Fee	$3,250	$5,500 - $9,200.00	$4,200	$7,500	$2,000	$11,500 - $16,000
Quarterly Fee	$75.00	$195.00	$110	$152.13	$109.26	$202.62
# of Licensed Operators	3	NA	3	1	1	5
MPCA Certificate of Commendation	41	NA	NA	28	NA	9

Preliminary Engineering Report

Breezy Point Wastewater Treatment Facility

Prepared for

The City of Breezy Point

May 2011

Mayor:	JoAnn Weaver
Council Members:	Tom Nelson Otto Schmid Tom Lillehei Scott Willer
City Administrator / Clerk:	Joe Rudberg
Wastewater Plant Supervisor:	John Monnier

CERTIFICATION

PRELIMINARY ENGINEERING REPORT

BREEZY POINT WASTEWATER TREATMENT FACILITY

Breezy Point, Minnesota

By

WIDSETH SMITH NOLTING

7804 Industrial Park Road
P.O. Box 2720
Baxter, MN 56425

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Michael E. Rude, P.E
Professional Engineer

43896
License Number

6/6/11
Date

BREEZY POINT WASTEWATER FACILITY

2011 PRELIMINARY ENGINEERING REPORT

TABLE OF CONTENTS

LIST OF EXHIBITS

INTRODUCTION

The City of Breezy Point owns and operates a wastewater treatment facility (WWTF) that treats municipal wastewater. This facility utilizes a series of ponds to treat wastewater to the point that it is suitable disposal via forested spray irrigation fields located on property also owned by the City.

Exhibit A on the following page provides an aerial photo of the City showing the location of its wastewater treatment facility outlined in red.

This facility was last studied in 2001 by McCombs Frank Roos Associates, Inc. The study was commissioned to evaluate methods by which its treatment capacity could meet future demands and maintain compliance to discharge standards.

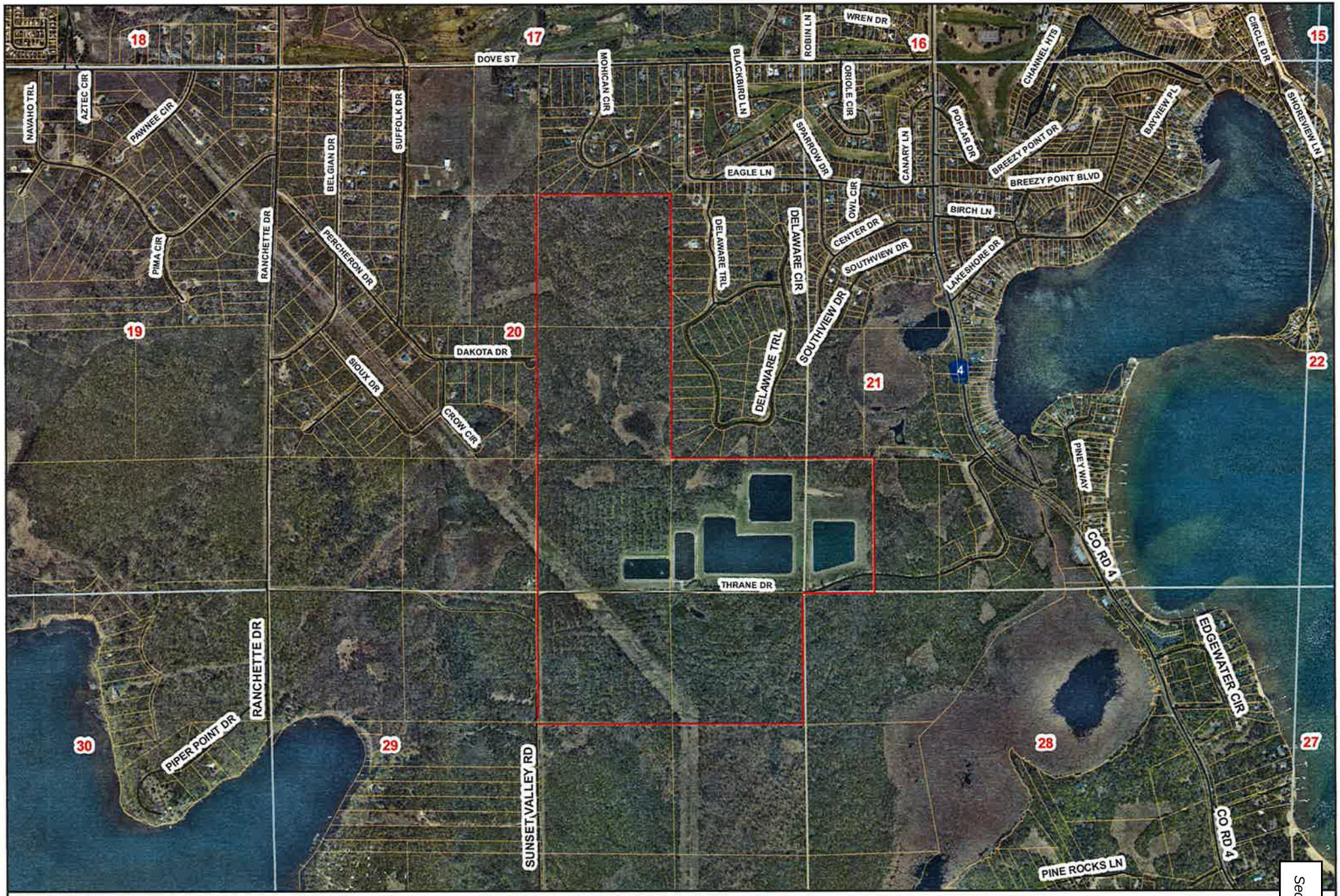
The facility is permitted under Minnesota Pollution Control Agency (MPCA) Solid Disposal System (SDS) Permit MN0047457.

In April of 2011, the City of Breezy Point retained the services of Widseth Smith Nolting to provide an updates study of this facility. Per the stated requirements of the request, the purpose of this study is to:

- Evaluate existing wastewater treatment facilities
- Project flows and loads on the wastewater treatment facility and lift stations
- Provide expansion and capacity alternatives where necessary
- Analyze future capital costs of the system

This report will summarize the findings of the study and provide recommendations on these points for the City to consider.

For the purposes of projections and financial analysis, a 10-year period has been requested by the City and will be used in this report.



Breezy Point WWTF

5/5/2011 8:44:22 PM

CROW WING COUNTY
BRAINERD, MINNESOTA 56401

116

These data are provided on an "A
basis, without warranty of any typ
expressed or implied, including bu
not limited to any warranty as to t
performance, merchantability, or f
for any particular purpose.

Section 1, ItemA.

PROJECTED FLOWS AND LOADS

Among other things, wastewater flows into the City's treatment facility are recorded on a regular basis and reported to the Minnesota Pollution Control Agency (MPCA) as part of the agency's permitting and compliance monitoring process.

This process makes it possible to analyze large amounts of data to identify historical patterns and predict, with some degree of confidence, future trends.

Exhibit B on the following page provides a graph of annual wastewater flows (in millions of gallons) for the years 1978, when initial construction of the treatment facility was completed, through 2010.

Based on a mathematical best fit of the historical data, a trend line has been calculated and display on the graph. The trend line has been projected forward through the year 2030.

Population projections are often considered when predicting future wastewater flows and loads. For this study, population data and projections for the City of Breezy Point was gathered from the State of Minnesota Demographer's Office and United States Census Bureau.

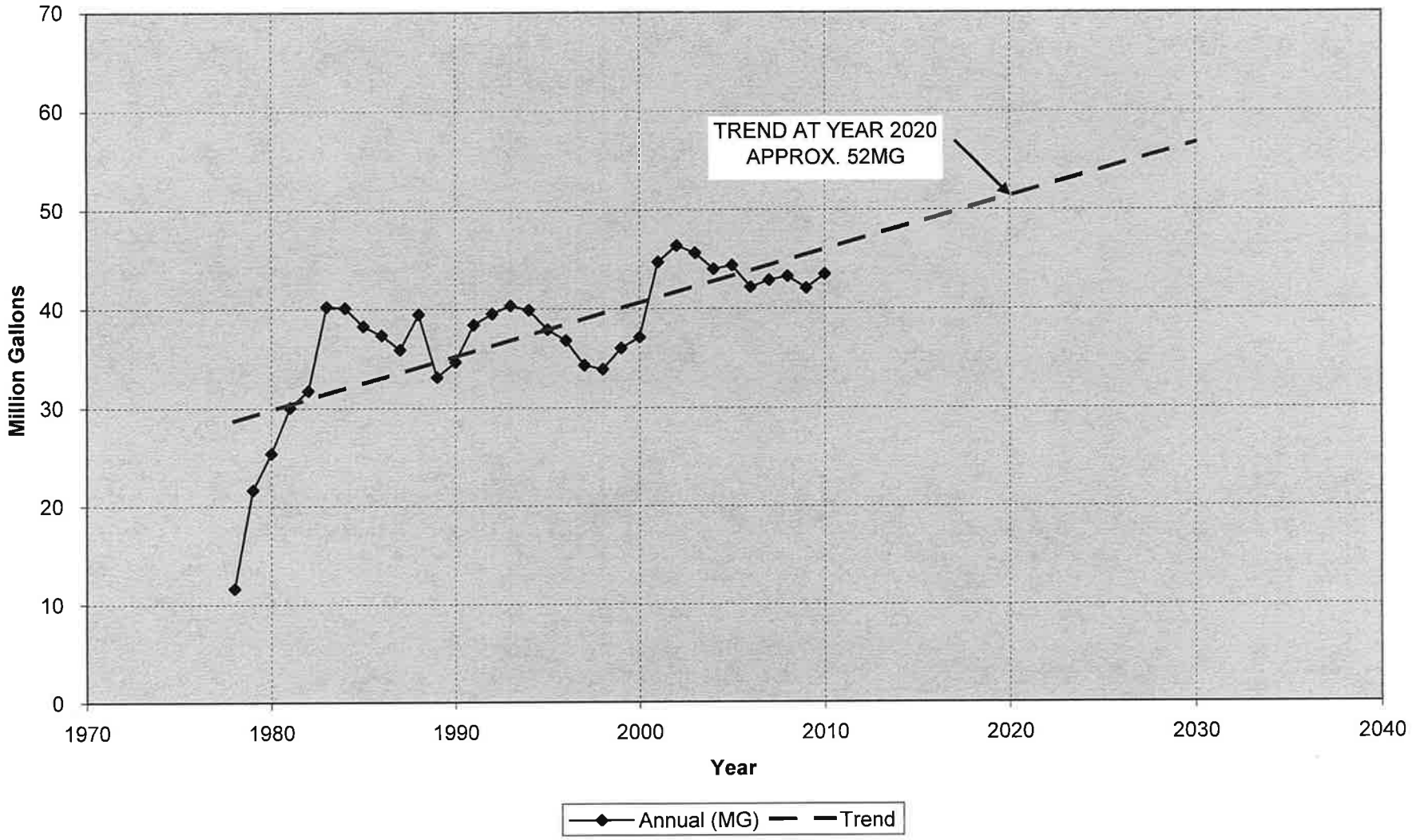
Historical population data was analyzed and is summarized in graphical form as Exhibit C on page 5 of this report. Also included on this graph are future population projections from the State Demographer's most recent (circa 2007) report.

From this graph, it can be seen that the population of Breezy Point has exhibited continuous growth from 1960 through the present. Periods of very high growth have been experienced between 1990 through 2000 at approximately 8.5% per year and 2000 through 2010 at approximately 9% per year.

There are a number of factors which contribute to making the use of population data less useful for predicting future wastewater flows and loads for the City of Breezy Point. Prominent among these factors is the City's suitability and history as a resort and vacation destination.

A large number of users of the City's wastewater collection and treatment system are residents of another city or state and are either resort visitors or seasonal residents of their privately-owned vacation properties. The wastewater flows generated by these non-residents does not correspond in any real way to the City's population.

Exhibit B - Sanitary Sewer Flows - Annual
City of Breezy Point



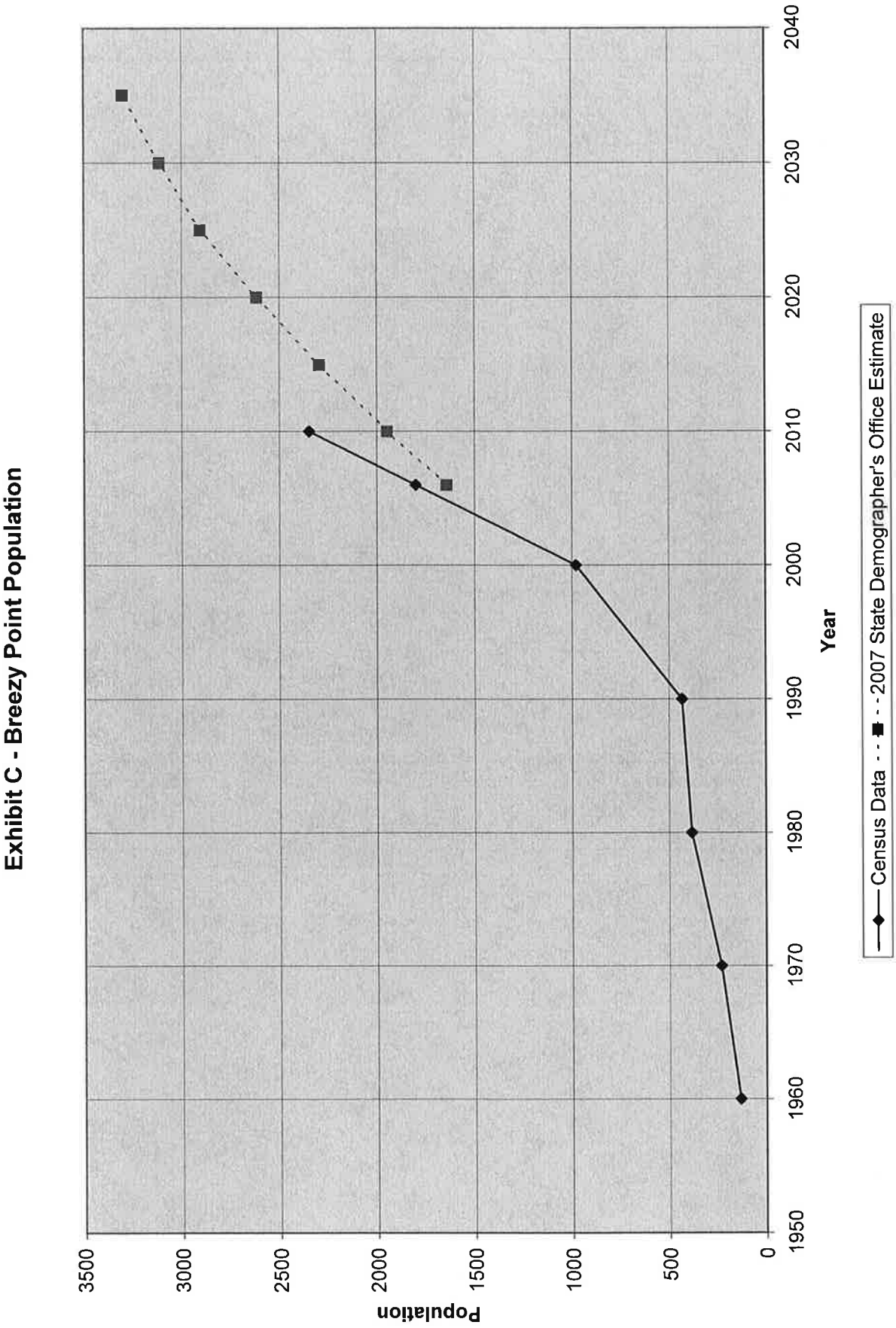


Exhibit C - Breezy Point Population
Population
3500
3000
2500
2000
1500
1000
500
0
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
Year
Census Data
2007 State Demographer's Office Estimate


Breezy Point Sewer Lines
Legend
Sewer Lines
Roads
ROAD TYPE
County Highway
Municipal- Minimum Maintenance
Municipal- Gravel
Municipal- Paved
Platted/Unopened Right of Way
Private Road
Twp. Road
CITY OF
BREEZY POINT

Another factor which would tend to preclude population data as predictive of future wastewater flows can be found by examining a map of the City's wastewater collection system. Exhibit D on the previous page 6 provides such a map.

Examination of its wastewater collection system map reveals that the collection system serves less than half of the geographic area of the City of Breezy Point. Since a large number of platted areas within the City are not served by the system, residents who have moved or will move into these areas have not contributed wastewater flows to the City's treatment facility and will not unless expansion of the system occurs in their neighborhood in the future.

These factors are supported by further examination of the historical population and wastewater flow data. During the period 1990 through 2000, for example, population increased from 432 to 979; an increase of 127%. During this same period, while the flows vary randomly a moderate amount from year to year, wastewater flows increased from about 35 million gallons per year (MGY) to about 40MGY; an increase of 14%. For the period 2000 through 2010, results are similar.

After careful consideration, use of historical use data and trending were chosen as most predictive of future wastewater flows for the City of Breezy Point and were used to provide capacity and financial analyses provided later in this report.

Due to the City's nature as a vacation destination, flows have historically varied greatly between what will be referred to as the summer (May through September) and winter (October through April) seasonal use periods. These will be analyzed separately, as usage in each of the seasonal periods impacts the wastewater treatment facility's capacity in a different manner.

EXISTING FACILITIES

The City of Breezy Point's wastewater treatment facility consists of a treatment sequence featuring two aeration ponds, followed by three storage ponds. These five ponds can be configured to be used in series or in some cases in parallel with each other.

Upon receipt by the facility, larger solids are removed by a mechanically-cleaned bar screen and flow is measured by a Parshall flume.

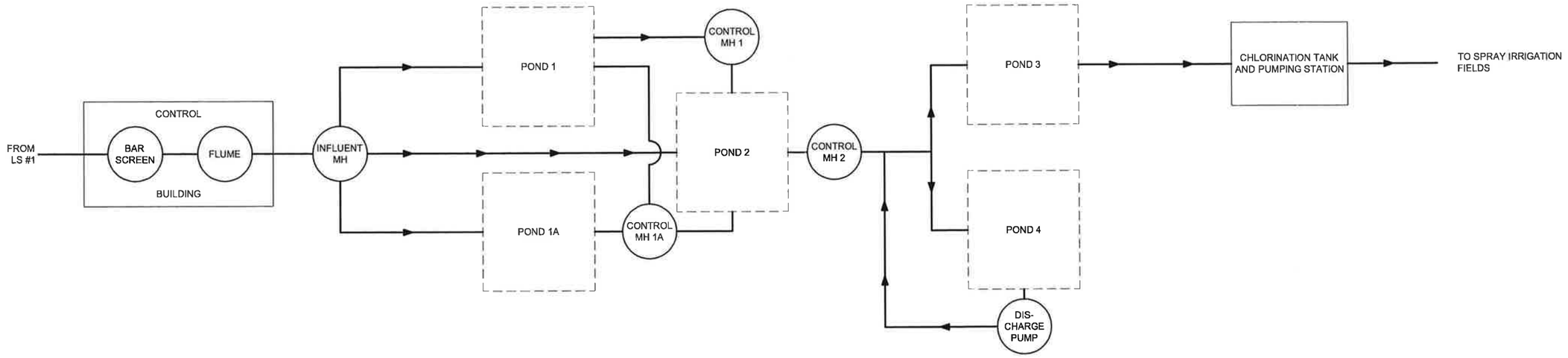
Primary treatment consists of aeration in ponds 1 and 1a. Pond 1 was constructed with the original facility and pond 1a was constructed as part of the 2004 Wastewater Treatment Facility Improvements to address increasing treatment demands.

When aeration is complete, wastewater from ponds 1 and 1a is discharged to ponds 2, 3, and 4 for storage until such time it is discharged by spray irrigation to forested areas set aside for this purpose. The City's facility presently includes 101.3 acres equipped for spray irrigation, with another 80 acres set aside for future expansion.

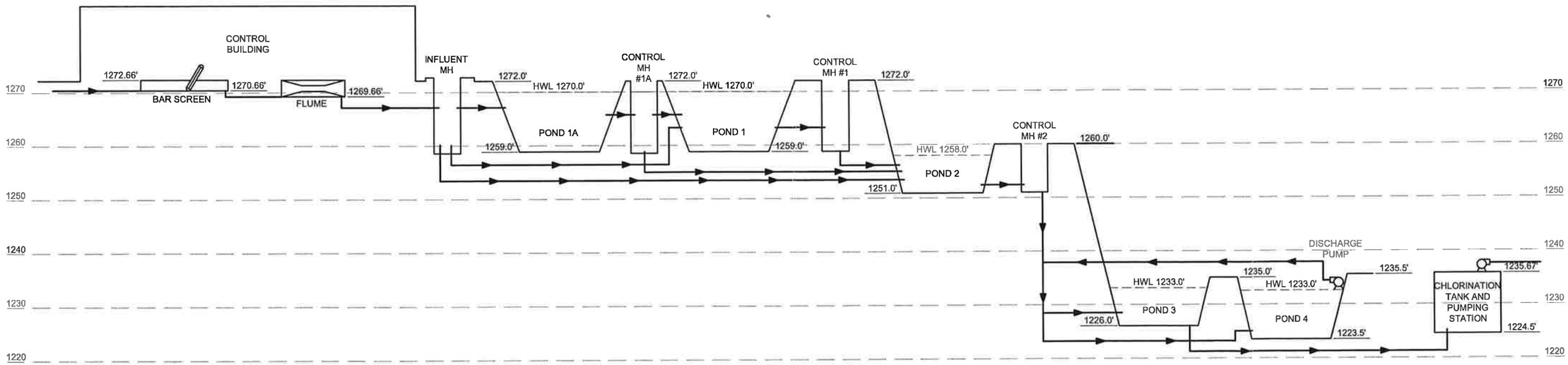
There is a network of seven ground water monitoring wells throughout the spray irrigation area. These wells are monitored for ground water quality and level. Previous years of data filed with MPCA show that the facility is functioning properly with high quality effluent used for irrigation.

Exhibit E on the following page provides a flow diagram and hydraulic profile for the wastewater treatment facility.

EXHIBIT E - WASTEWATER TREATMENT FACILITY
FLOW DIAGRAM AND HYDRAULIC PROFILE



FLOW DIAGRAM
NOT TO SCALE



HYDRAULIC PROFILE
NOT TO SCALE

ARCHITECTS
ENGINEERS
ENVIRONMENTAL SERVICES
LAND SURVEYORS
WATER RESOURCES

WIDSETH SMITH NOLTING

www.widseth.com

I HEREBY CERTIFY THAT THIS PLAN, FINDING OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

MICHAEL E. RUDE — DATE 6/13/2011 — LIC. NO. 43026

REVISIONS DESCRIPTION | REV# | DATE

DATE: JUNE, 2011
SCALE: NOT TO SCALE
DRAWN BY: M.E.R.
CHECKED BY: M.E.R.
JOB NUMBER: 0145B00010.000

2011 PRELIMINARY ENGINEERING REPORT
CITY OF BREEZY POINT
CROW WING COUNTY, MINNESOTA
SYSTEM SCHEMATIC

SHEET

Condition of Facilities

During research for this report, wastewater treatment facilities were surveyed and staff was interviewed to determine what major needs were likely during the study period.

While no specific major needs were identified for the study period, the following major items should be considered when budgeting for longer-term maintenance needs:

- Pond liners
- Aeration equipment (blowers, aerators, and piping)
- Transfer and irrigation pumps
- Sludge removal for primary treatment ponds

Based on conversations with staff and information presented during Council meetings, it is apparent that operating income from quarterly usage charges has historically been adequate to meet periodic maintenance needs while providing a reserve sufficient for the major maintenance items mentioned previously.

A more in-depth analysis can be performed if the City is interested in further studying the adequacy of its quarterly usage charges to meet projected future maintenance needs.

OPERATION ISSUES

Considering its age and condition, major operational issues that will likely affect the City's wastewater treatment facility within the study period will involve addressing system capacity.

Control Building

The influent pretreatment and control building has been upgraded as recently 2001, when an existing comminutor was upgraded to the present mechanically-cleaned bar screen and Parshall flume. Capacity of this equipment is more than adequate for expected loading within the study period.

Aeration Ponds

Following the treatment process downstream, the BOD treatment capacity of the system is addressed by ponds 1 and 1a. The volume of pond 1, and the recently added pond 1a are both approximately 4.7 million gallons, for a total volume of 9.4 million gallons.

Both of these volumes are computed on a usable depth of 9 feet. Actual usable depths are somewhere between 9 feet and the designed 10 feet due to construction issues during the 2004 improvements project.

These two ponds provide a capacity based on a 25-day aeration of 377,000 gallons per day. Based on flow projects performed for this report, this capacity should be adequate for well beyond the study period.

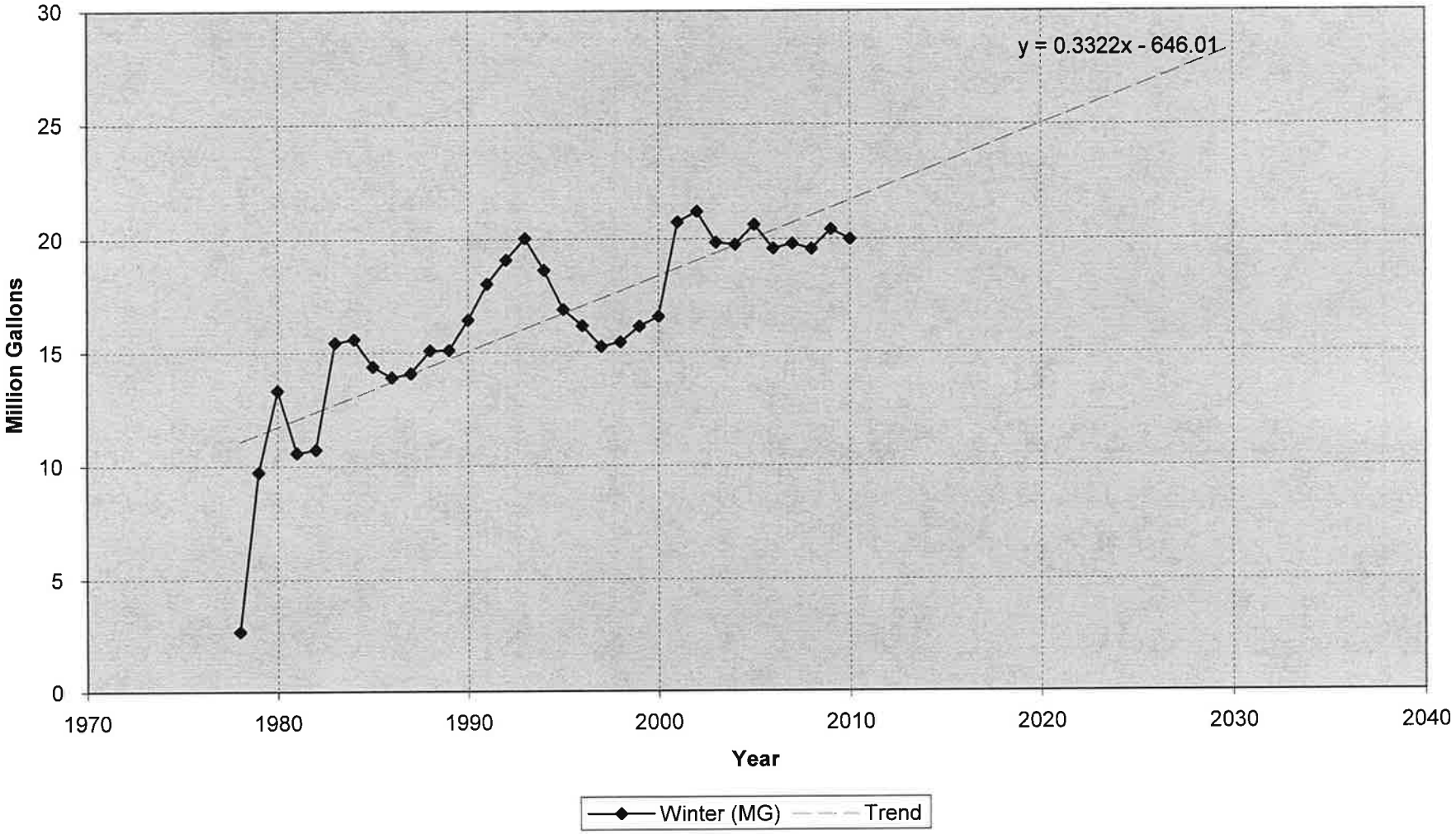
Storage Ponds

Capacity analysis for the storage ponds is evaluated over winter months, when spray irrigation is not possible. This 210 day period, which covers the months of October through April, has experienced a higher rate of growth in flows than has been experienced during the remaining months of the year.

Exhibit F provides a graph of the annual flows during this October through April storage period.

Based on this data, it is expected that winter storage needs for the wastewater treatment facility will reach 85% of storage pond capacity within the next 10 years. When flows reach this portion of the facility's capacity, it is recommended that the City commission a Facility's Plan for submittal to the MPCA that will examine options to address future facility needs in this area.

Exhibit F - Sanitary Sewer Flows - Winter
October through April
City of Breezy Point



Spray Irrigation System

As mentioned during the system description, seven ground water monitoring wells are present within the spray irrigation areas of the City's wastewater treatment facility. These wells are periodically sampled for groundwater quality and depth. Results are reported to MPCA for analysis and use in permitting.

Ground water monitoring has been used to determine whether spray irrigation application rates are appropriate to maintaining ground water quality standards. It is possible that application rates may be adjusted, either higher or lower, during future MPCA permit cycles. Adjustment to these rates would have a direct affect on the treatment facility's capacity.

At present permitted rates, and with future demands estimated by calculations performed for this report, the facility's spray irrigation area is expected to be adequate for a time well beyond the study period.

It does not appear to be a likely scenario, but should a downward adjustment to permitted application rates occur, the City is well-positioned with additional acreage to expand the spray irrigation system. In this event, it is recommended that the City commission a Facility's Plan for submittal to the MPCA to address this expansion.

Lift Stations

Lift station capacity is typically determined by analyzing the hours its pumps operate over the course of a given day. Peak days are used to determine whether pumping capacity is adequate 100% of the time. Inadequate pumping capacity can result in backups and property damage during even brief peak usage periods.

Exhibit G provides data collected from the nine lift stations presently operating within the City. Analyzing this data, and taking into account anomalies in lift station operation (stuck floats, control errors, etc.) it is apparent that the lift stations are adequate for present loads.

Assuming a peaking factor (peak daily flow vs. average daily flow) of 4.0, which is typical for a smaller City such as Breezy Point, City staff would be well advised to watch for lift stations which have operating times above about 6 hours per day. This would indicate that improvements to increase pumping capacity are needed.

The data indicate that lift stations #1, #2, #3 and #4 will likely require some type of upgrade within the study period. In most cases, these upgrades will likely involve pump or impeller replacement to larger sizes. It is possible that associated upgrades to electrical service may be necessary due to the larger electrical requirements associated with a pump replacement.

While the data indicate that no such improvements will likely be necessary on the remainder of the lift stations within the study period, lift station hours should continue to be monitored as insurance against unexpected escalations in operations and maintenance costs.

Exhibit G - Lift Station Daily Hours

Peak Day per Month

	LS 1		LS 2		LS 3		LS 4		LS 5		LS 6		LS 7		LS 8		LS 9	
	Pump 1	Pump 2	Pump 1	Pump 2	Pump 1	Pump 2	Pump 1	Pump 2	Pump 1	Pump 2	Pump 1	Pump 2	Pump 1	Pump 2	Pump 1	Pump 2	Pump 1	Pump 2
Jan-10	1.8	1.8			0.7	0.7	1.8	1.9	0.4	0.6	0.4	0.5	0.3	0.3	0.1	0.1	0.1	0.1
Feb-10	2.1	1.9			0.3	0.5	1.4	2.2	0.4	0.5	0.4	0.4	0.3	0.3	0.1	0.1	0.1	0.1
Mar-10	2.2	2.1			0.6	0.6	1.3	1.9	0.5	0.6	0.8	0.9	0.4	0.4	0.1	0.1	0.1	0.1
Apr-10	1.7	1.6			0.5	0.4	1.9	2.0	0.4	0.6	0.5	0.5	0.4	0.4	0.1	0.1	0.1	0.1
May-10	2.4	2.4	0.7	0.8	1.3	1.5	3.2	2.1	0.4	0.5	0.5	0.5	0.4	0.4	0.1	0.1	0.1	0.1
Jun-10	2.4	2.4	0.5	1.7			2.8	2.9	0.5	0.6	0.7	0.9	0.5	0.5	0.1	0.1	0.1	0.1
Jul-10	3.4	3.3	1.3	1.4	2.1	2.1	3.9	4.4	0.9	0.8	0.5	0.6	0.5	0.4	0.1	0.1	0.1	0.1
Aug-10	2.8	2.6	1.0	1.1	1.3	1.3	3.3	3.3	0.6	0.6	0.6	0.5	0.3	0.3	0.1	0.1	0.1	0.1
Sep-10	3.0	2.9	0.8	0.9	1.2	1.6	2.5	3.7	0.8	1.1	0.7	0.7	0.7	0.7	0.1	0.1	0.1	0.1
Oct-10	1.9	1.8	0.5	0.4	0.8	0.8	2.0	2.7	0.4	0.4	0.7	0.7	0.4	0.4	0.1	0.1	0.1	0.1
Nov-10	1.6	1.5	1.0	0.3	0.7	0.7	2.0	2.0	0.3	0.4	0.5	0.5	0.3	0.3	0.1	0.1	0.1	0.1
Dec-10	2.8	2.6	0.8	0.2			3.6	3.2	0.6	0.7	0.4	0.4			0.1	0.1	0.1	0.1
Jan-11	2.1	2.0	3.3	5.8							0.5	0.5					0.1	0.1
Feb-11	2.2	2.2	0.8	0.8							0.6	0.6					0.1	0.1
Mar-11	2.5	2.4			0.4	0.4	3.0	3.5	0.5	0.4			0.4	0.3	0.1	0.1		
Apr-11					0.5	0.5	2.4	2.5	0.3	0.5			0.8	0.8	0.2	0.2		
Max	3.4	3.3	3.3	5.8	2.1	2.1	3.9	4.4	0.9	1.1	0.8	0.9	0.8	0.8	0.2	0.2	0.1	0.1

COSTS AND ANALYSIS

Capital Costs during Study Period

Future capital costs involved with operating the City's wastewater treatment facility and lift stations over the next 10 years will likely include preliminary investigation into additional winter storage capacity, including a Facility's Plan for submittal to MPCA.

It is recommended that the City make financial plans for a comprehensive Facilities Plan that should cost $30,000 to $40,000 (in 2011 prices) to take place near the end of the 10-year study period.

In addition, based upon expected growth during the study period and average ERU's served per lift station, it should be expected that at least one additional lift station will be constructed during the study period. It is recommended that the City make financial plans to spend between $75,000 and $125,000 (2011 prices) on a future lift station.

Sewer Availability Charge

As part of this report, the City has requested an analysis to determine a fair and equitable Sewer Availability Charge (SAC) for use in financing capital costs related to its wastewater treatment facility and lift stations. While there are a number of ways this can be approached, after some consideration the following methodology was used.

Usage and ERU data was analyzed to determine the annual long-term sanitary sewer flow for the City's average ERU. Over the period 1979 through 2010 this average calculates at 43,650 gallons per ERU per year.

Using this same average, the wastewater treatment facility's present permitted capacity of 70 million gallons per year provides an equivalent capacity of 1,604 ERU's.

Using 2011 construction pricing, the reconstruction cost of the wastewater treatment facility is estimated to be $3,800,000.

From these figures, it can be shown that the capital cost for a single ERU's portion of the wastewater treatment facility is $2,370 in 2011.

For the lift station component of the SAC, the analysis is similar. The City's 9 present lift stations serve a total of 1281.80 ERU's in 2011; or 142.42 ERU's per lift station. Dividing a lift station capital cost of $125,000 by an average number of users provides a lift station capital cost per ERU of $878.

Adding these two components provides for a SAC of $3,248.

RECOMMENDATIONS AND IMPLEMENTATION

After reviewing the contents of this report, it is recommended that the City take the following actions:

- Determine an appropriate Sewer Availability Charge and incorporate it into the City's ordinance and fee schedule
- Continue to monitor and report lift station hours
- Continue to monitor wastewater treatment facility data and report to MPCA in accordance with statutory requirements
- Plan for a future MPCA Facilities Plan to take place at such time as winter storage demand reaches approximately 85% of capacity

In addition, it is recommended that a summary report on operations and capacity be prepared for Council review on an annual basis.

APPENDICES

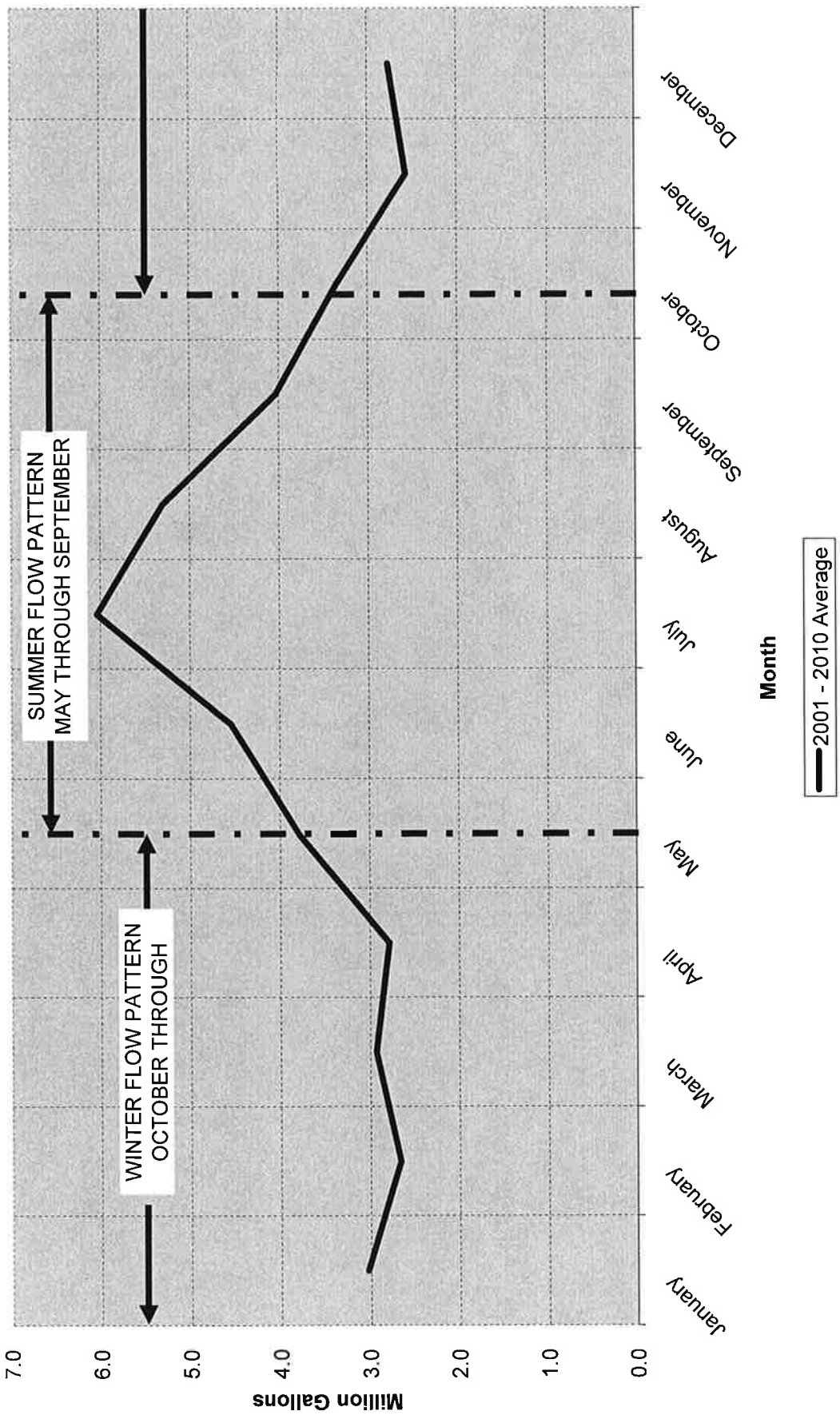
2011 SAC ANALYSIS
Breezy Point WWTF

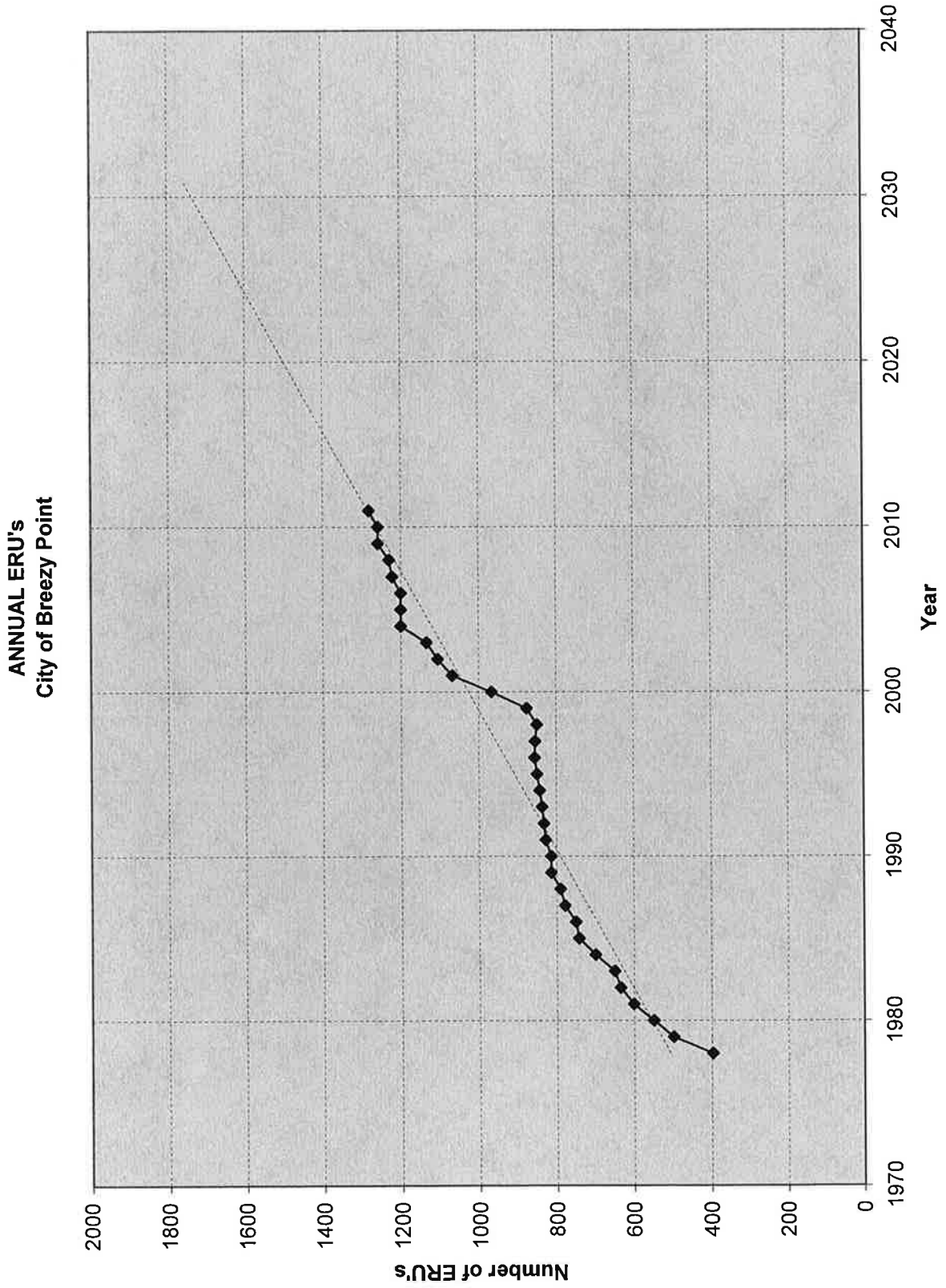
Waste Water Treatment Facility		
Permitted Capacity	70,000,000	gallons per year
Average ERU	43,650	gallons per year
WWTF Capacity	1,604	ERU's
WWTF Capital Cost (2011)	$3,800,000	
WWTF Cost per ERU (2011)	**$2,370**	
Lift Stations		
Lift Stations	9	
2011 ERU's	1281.80	
ERU / Lift Station	142.42	
Cost / Lift Station	$125,000	
Lift Station Cost / ERU	**$878**	
2011 SAC (WWTF + Lift Stations)	**$3,247**	

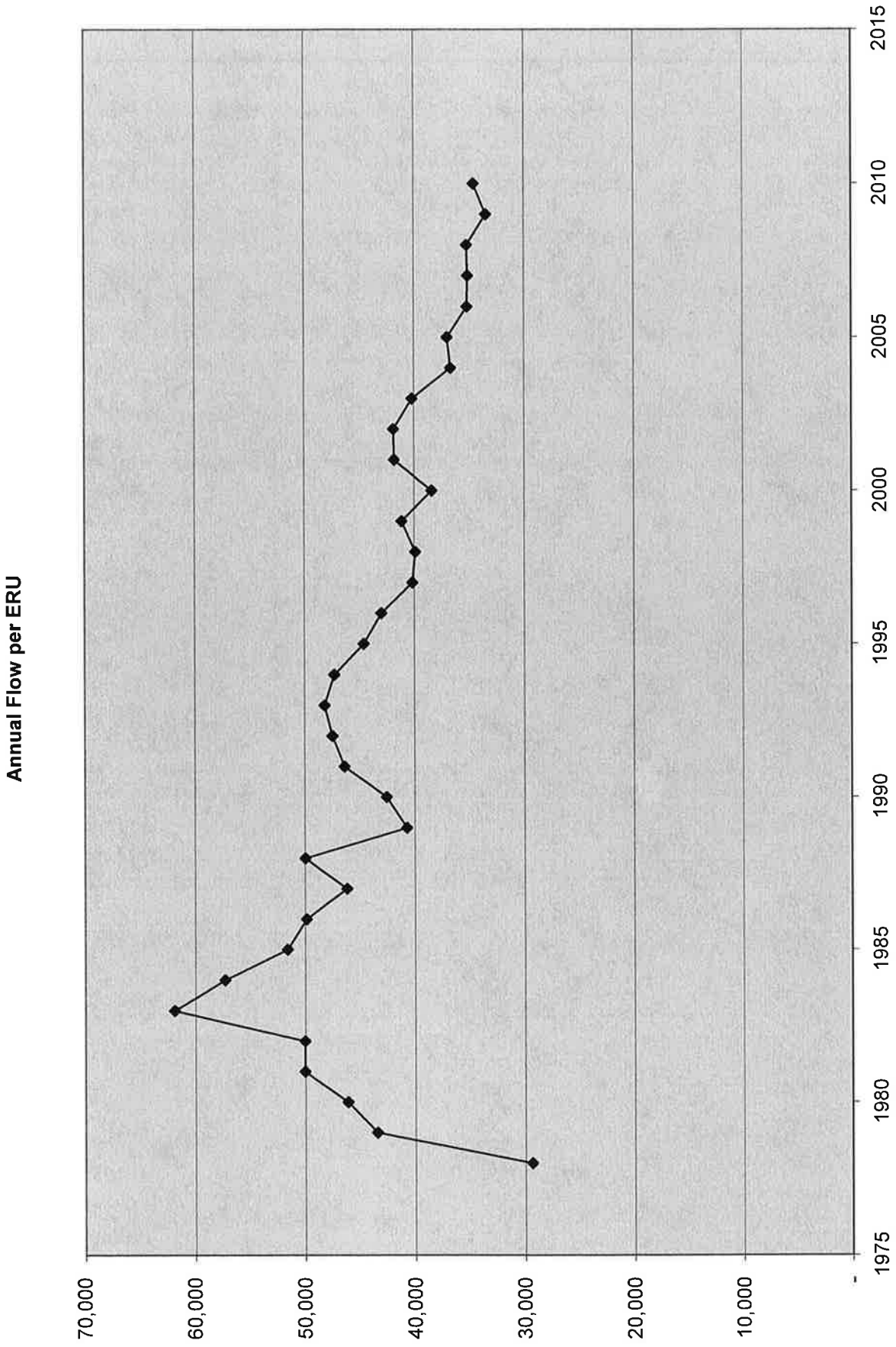
2011 CAPACITY ANALYSIS
Breezy Point WWTF

Waste Water Treatment Facility		
Permitted Capacity	70.0	Million Gallons
Permitted Capacity	59.5	Million Gallons
Average Annual ERU Usage	43,650	Gallons
WWTF Capacity	1,604	ERU's
2011 Usage	1,282	ERU's
Capacity Remaining	322	ERU's
1980 - 2010 ERU Growth	25	ERU / Year
85% Capacity at Year	2,035	
100% Capacity at Year	2,055	
Winter Storage		
Present Capacity	30.7	Million Gallons
85% of Present Capacity	26.1	Million Gallons
85% Capacity at Year	2023	
100% Capacity at Year	2037	
BOD Loading		
Pond 1 & 1A Volumes	9,435,400	Gallons
25-Day Capacity	377,416	GPD
85% of Capacity	320,804	GPD
85% Capacity at Year	2118	
100% Capacity at Year	2164	

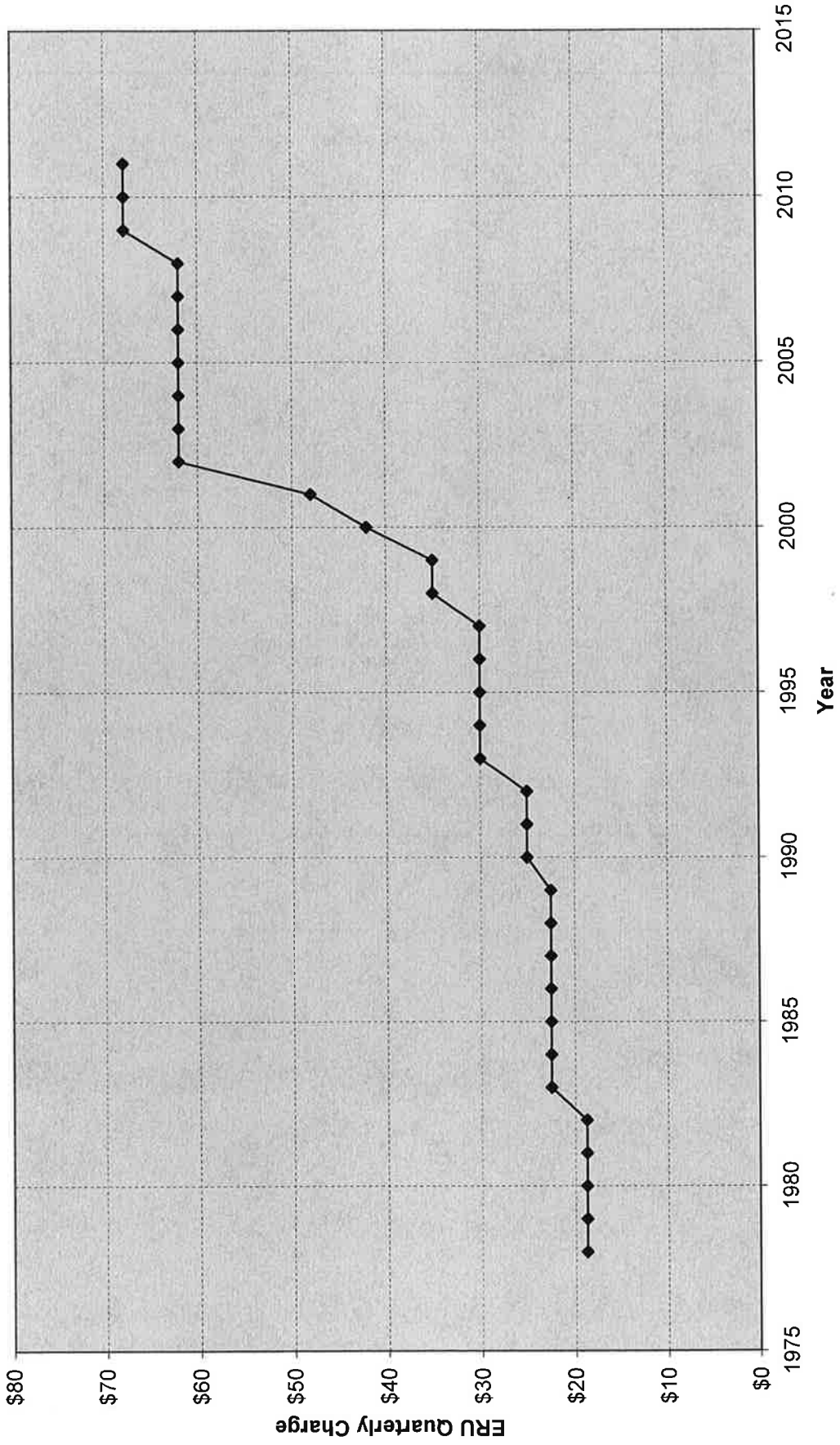
Monthly Sanitary Sewer Flows
City of Breezy Point




ANNUAL ERU's
City of Breezy Point
Number of ERU's
Year
0
200
400
600
800
1000
1200
1400
1600
1800
2000
1970
1980
1990
2000
2010
2020
2030
2040


Annual Flow per ERU
70,000
60,000
50,000
40,000
30,000
20,000
10,000
-
1975
1980
1985
1990
1995
2000
2005
2010
2015

Sanitary Sewer Quarterly Charge per ERU
City of Breezy Point



Preliminary Engineering Report for the Breezy Point Wastewater Treatment Facility

Prepared for

The City of Breezy Point

November 2001

Mayor:	*Carrie Ruud*
Council Members:	*Nic Anderson*
	David Slipy
	Scott Willer
	Diane Williams
City Clerk:	*Vicki Willer*
Wastewater Plant Supervisor:	*Tim Polipnick*

PRELIMINARY ENGINEERING REPORT FOR THE

BREEZY POINT WASTEWATER TREATMENT FACILITY

PREPARED FOR:

The City of Breezy Point, Minnesota

November 2001

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

11/16/2001

Bryan T. Oakley, P.E.
Engineer Minn. Reg. No.24480

TABLE OF CONTENTS

FIGURES

TABLES

1. INTRODUCTION

The City of Breezy Point owns and operates a wastewater treatment facility (WWTF) that treats municipal wastewater. The existing liquid treatment train includes one aerated pond followed by three storage ponds. The treated wastewater is discharged to forested spray irrigation fields. Because wastewater is treated in a pond system, Breezy Point does not currently have or need a dedicated solids treatment train.

The wastewater treatment facilities at the City of Breezy Point have met discharge criteria as set forth in the City's National Pollutant Discharge Elimination System (NPDES) permit; however, growth due to permanent and seasonal residential development is expected to increase wastewater treatment requirements. The City has retained McCombs Frank Roos Associates, Inc. to evaluate the existing wastewater treatment facility and prepare a Preliminary Engineering Report to evaluate methods by which treatment capacity can continue to meet discharge standards in the future.

During 1999, several memos were prepared regarding existing capacity, projected growth and upgrade options for the WWTF.

1. A February 15 memo focused on evaluating the capacity of the existing wastewater treatment infrastructure in Breezy Point.
2. An October 14 memo focused on population projections, design flow projections and a schedule of required upgrades of the existing WWTF based on the capacity of each component.
3. A December 23 memo presented capital costs and recommended a plan and schedule for upgrading the existing WWTF.

These recommendations were presented to the City Council. Information developed for these memos has been updated and is included in this report.

Additional objectives of this report are to:

1. Describe additional treatment alternatives for meeting applicable effluent, water quality and public health requirements for the planning period; specifically, the activated sludge processes: sequencing batch reactors and oxidation ditches.
2. Prepare a preliminary flow schematic of the evaluated alternatives.
3. Prepare a cost-effective analysis of the alternatives considered.
4. Present an implementation plan that will allow the facility to meet discharge permit limits during construction.
5. Prepare an estimate of construction, annual operation and maintenance, and equipment replacement costs.

1.1 Planning Area

The planning area for this Facilities Plan includes the existing collection system within the corporate limits of the City of Breezy Point as shown in Figure 1-1.

Breezy Point was known for many years as a resort owned by Captain Billy Fawcett. This resort, which has since passed through several ownerships, has always been the focal point of the area.

As part of the development by previous owners of the resort complex, large amounts of land were platted, developed with streets and offered for sale to the public. The platted areas designated White Birch Additions are primarily lots larger than 1/2 acre. The platted areas designated Breezy Point Estates are primarily smaller lots.

Originally incorporated as Pelican Lakes, the City's name was changed to Breezy Point in 1969. As a City, it is organized and operates under the laws of the State of Minnesota.

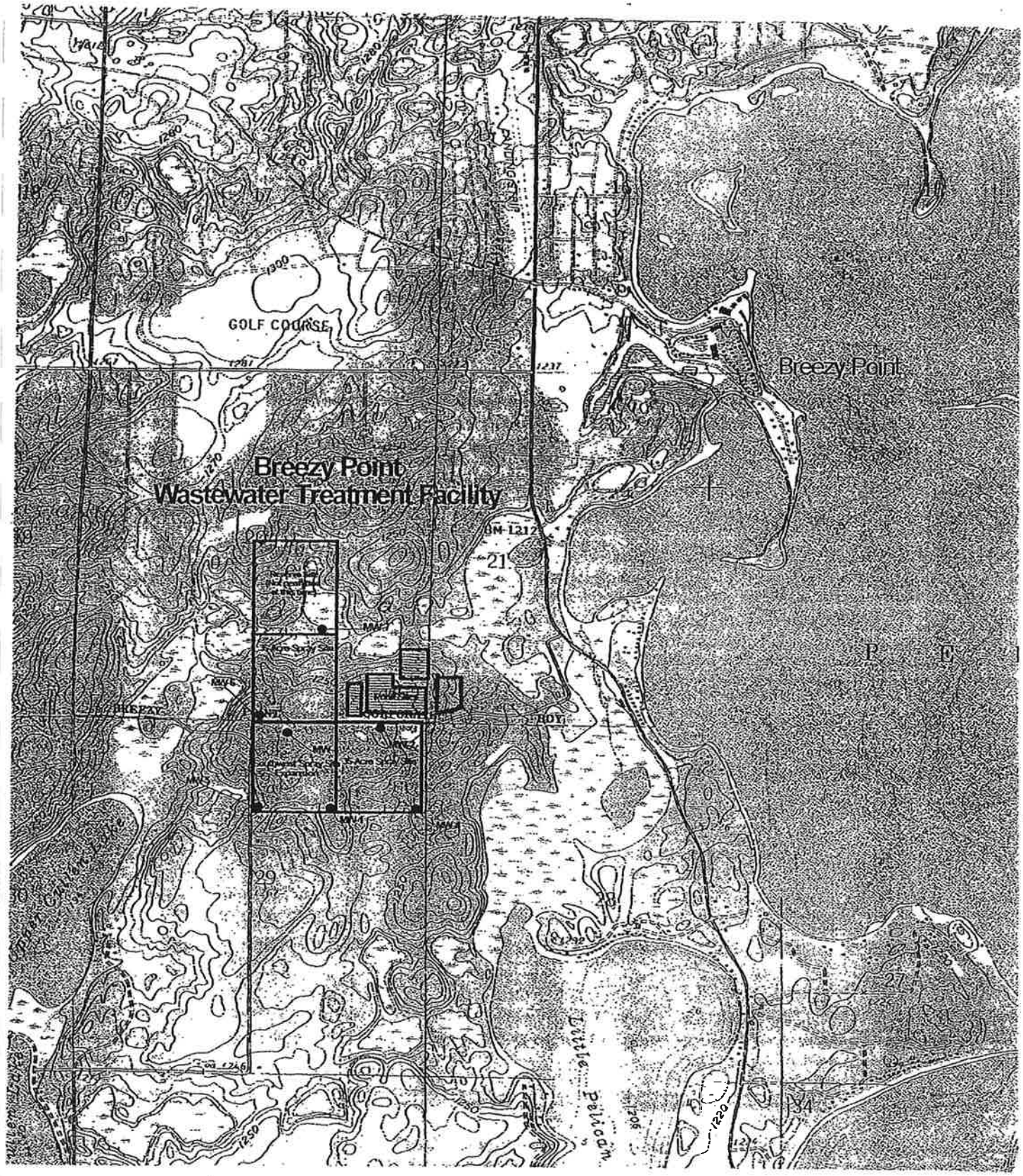


Figure 1-1 – City of Breezy Point

1.2 Environmental Resources

The City of Breezy Point, Minnesota, is located in Crow Wing County in Township 136 North, Range 28 West of the 5th Principal Meridian in North Central Minnesota. Breezy Point is located in a leading recreational area. It is an area of hills and mixed forests of hardwoods and softwoods. The area contains many lakes of varying size providing a wide variety of fishing. It also contains many swimming beaches, golf courses and hunting areas. Winter recreational opportunities include ice fishing, cross-country skiing and snow mobiling.

Pelican Lake, which forms the nucleus for the recreational attraction area, is a large lake approximately 8,500 acres in area with depths to 104 feet. The lake lies within the upper Mississippi watershed and has a shoreline of approximately 24.4 miles.

Minnesota Trunk Highway 371 and County State Aid Highways 11 and 4 provide access to the City of Breezy Point. A private airport is located within City limits. The closest commercial airport is located in Brainerd.

The climate of the area is sub-humid continental with cold winters and moderately warm summers. Average monthly temperatures range from 6°F in January to 73°F in July with extremes ranging from -30°F to 100°F. Breezy Point receives an average of 28 inches of precipitation during the year with an average of 18.5 inches during the period from May 1 through September 30.

The Breezy Point Wastewater Treatment Facility is not located adjacent to any surface water and, therefore, is not affected by any 100-year flood boundaries.

2. PROJECTED FLOWS AND LOADS

2.1 Population of Breezy Point

The city of Breezy Point is unique in its flow patterns observed at the Wastewater Treatment Facilities (WWTF). High flows occur on weekends during the summer when there are high levels of recreational activities and low flows are observed in the late fall and early spring when recreational activity is low. Capacities and design flows at the WWTF must account for this seasonal flow pattern. The population contributing to these flows can be split into two categories, permanent and seasonal.

The permanent population will be defined as the population that has been determined in recent estimations and counts. The flow contributed by the permanent population will be considered to be the lowest average daily flow during any month of the year.

The seasonal population supported by the area is difficult to define. It is made up of both resort-type property and private seasonal/recreational property. Resorts are not required to provide attendance numbers and the number of private seasonal cottages in use at any given period is not easy to identify. The majority of wastewater flow contributed by the seasonal population occurs on weekends.

For design purposes, the population contributing any flows greater than the lowest monthly average daily flows will be defined as seasonal. Future seasonal population will be estimated from past flow trends that demonstrate the typical amount of flow contributed.

2.2 Design Period

Population estimates will be made for five-year intervals over the next 20 years, with the final design year being 2022. This will allow design flows to be defined for these periods. Bottlenecks of treatment capacity can then be identified and a time frame for improvements to the WWTF can be developed from these flow projections. Update and revision of the flow projections will

be necessary during final design of the future projects identified in this memo to maximize design life.

2.3 Population Projections

Design population estimates have been developed from past population counts from the state demographer and population estimates and projections provided in the 1997 City of Breezy Point Comprehensive Plan. Both sets of population estimates are shown in Table 2-1.

Table 2-1 – Population Estimates

Year	State Demographer Population Estimates	1997 Comprehensive Plan Population Estimates
1960	134	134
1970	233	233
1980	384	384
1990	432	432
1991	437	
1992	443	
1993	457	
1994	461	
1995	544	544
1996	622	624
1997	635	
1998	701[1]	
1999	774	
2000	979[2]	752[3]
2010		1310[3]

1 – Revised from 1999 estimate
2 – 2000 census
3 – 1997 projection

Two distinctive rates of growth can be seen for Breezy Point in the State Demographer's estimates. A fairly constant rate of growth appears from 1960 up to 1994. A much more rapid rate of growth occurs from 1994 to 2000. Both of these rates of growth are shown as the linear regressions on Figure 2-1. These regressions have been projected forward for twenty years to give a range of high and low possible growth for Breezy Point. Also plotted in Figure 2-1 are the population estimates found in the 1997 Comprehensive Plan. A linear regression line plotted

through these points and projected forward through 2020 fits within the high and low growth rates. The projections developed in and extended from the Comprehensive Plan estimates will be adopted as the design population.

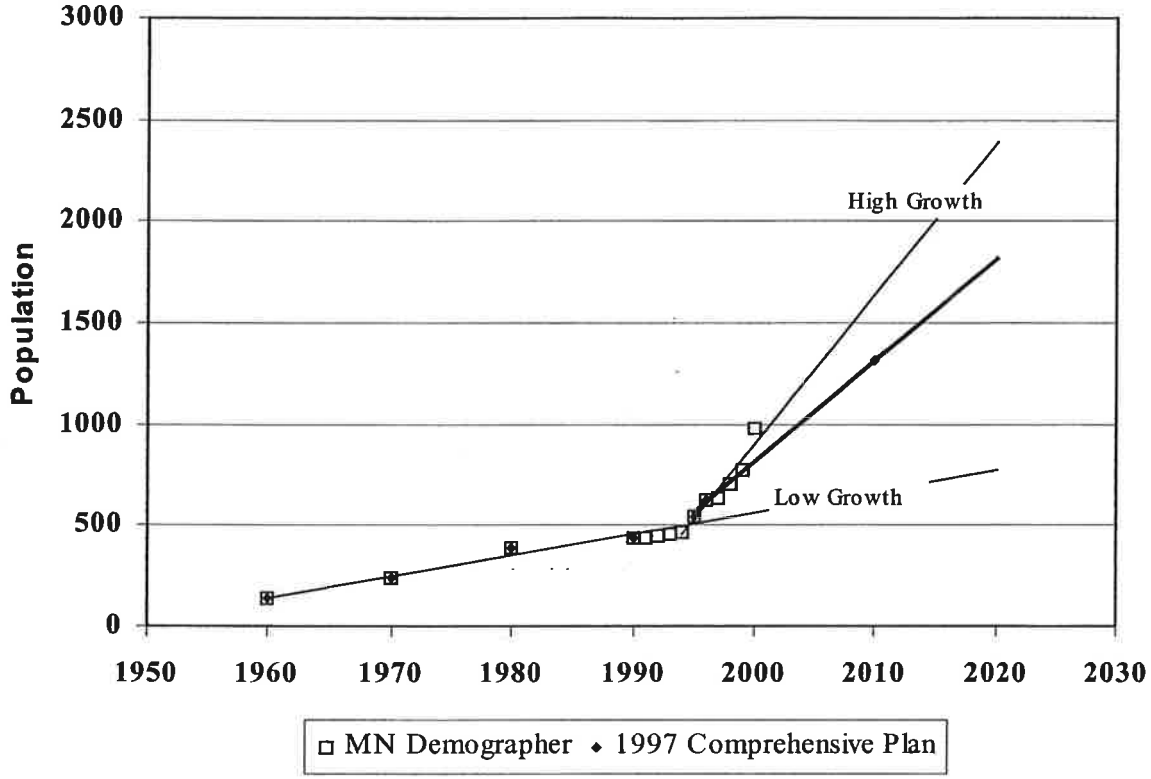


Figure 2-1 – Breezy Point Population

Table 2-2 gives the design population estimates that will be used for the WWTF analysis.

Table 2-2 – Population Estimates for Design

Year	Design Population Estimate
1996	624
2000	979
2007	1160
2012	1411
2017	1662
2022	1913

2.4 Determination of Design Flows

Design flows for analysis of the Breezy Point WWTF can be determined from the calculated population and using past flow records. Influent flow records from 1993 through September 2001 were used to develop flow trends. Figure 2-2 shows the average daily flow during each month using the last five years of data. The figure also shows the range recorded for each month during the last five years.

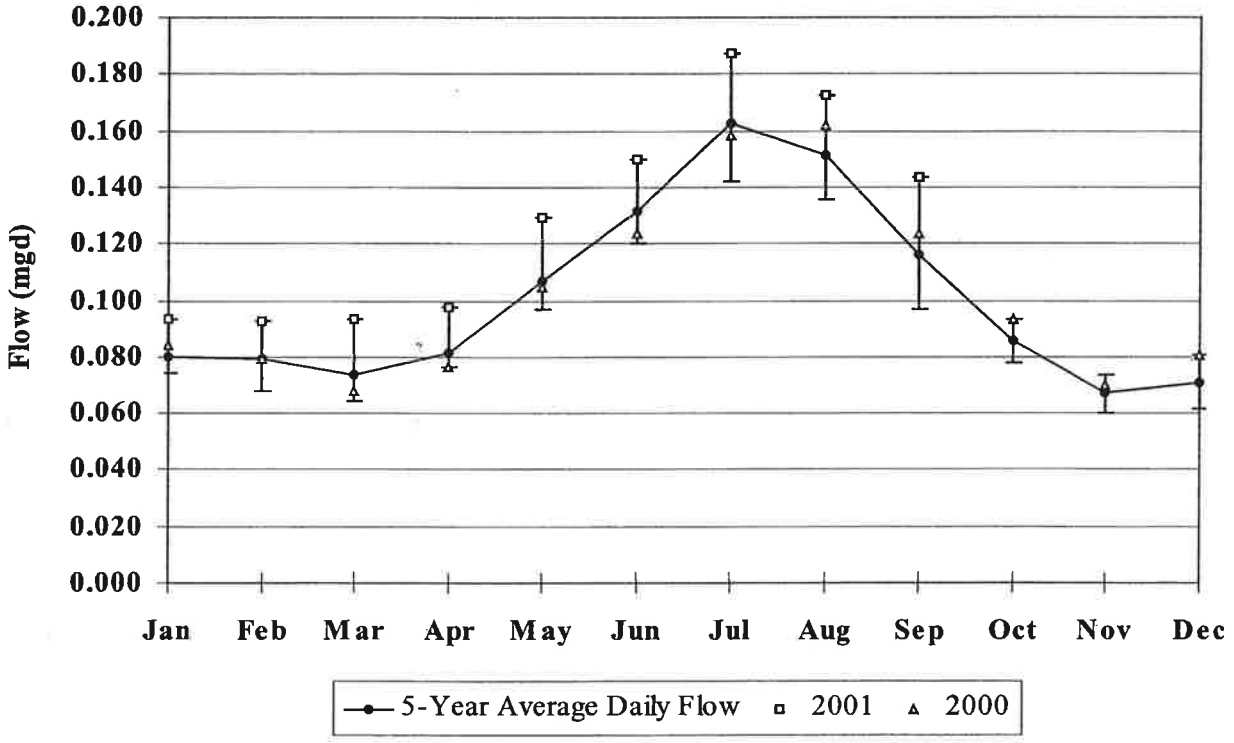


Figure 2-2 – Average Daily Flow (Jan-96 through Sep-01)

The same general trend appears each year, with the high flows occurring in July and low flows during November. The maximum daily flow observed each year is typically seen on the Saturday closest to July 4. During June, July and August of 2000, a total of 120 new hotel units were connected to the sewer collection system. As a result of these additions, the WWTF has experienced the maximum influent flow ever recorded for each month since August 2000 with the single exception of November 2000.

The City of Breezy Point has done an excellent job controlling inflow and infiltration (I/I) into the sanitary sewer. Wet weather due to heavy rains and snow-melt does not appear to influence flows to the WWTF. Therefore, future flows can be predicted based only on population. Figure 2-3 shows per capita flows which can be used for design flows.

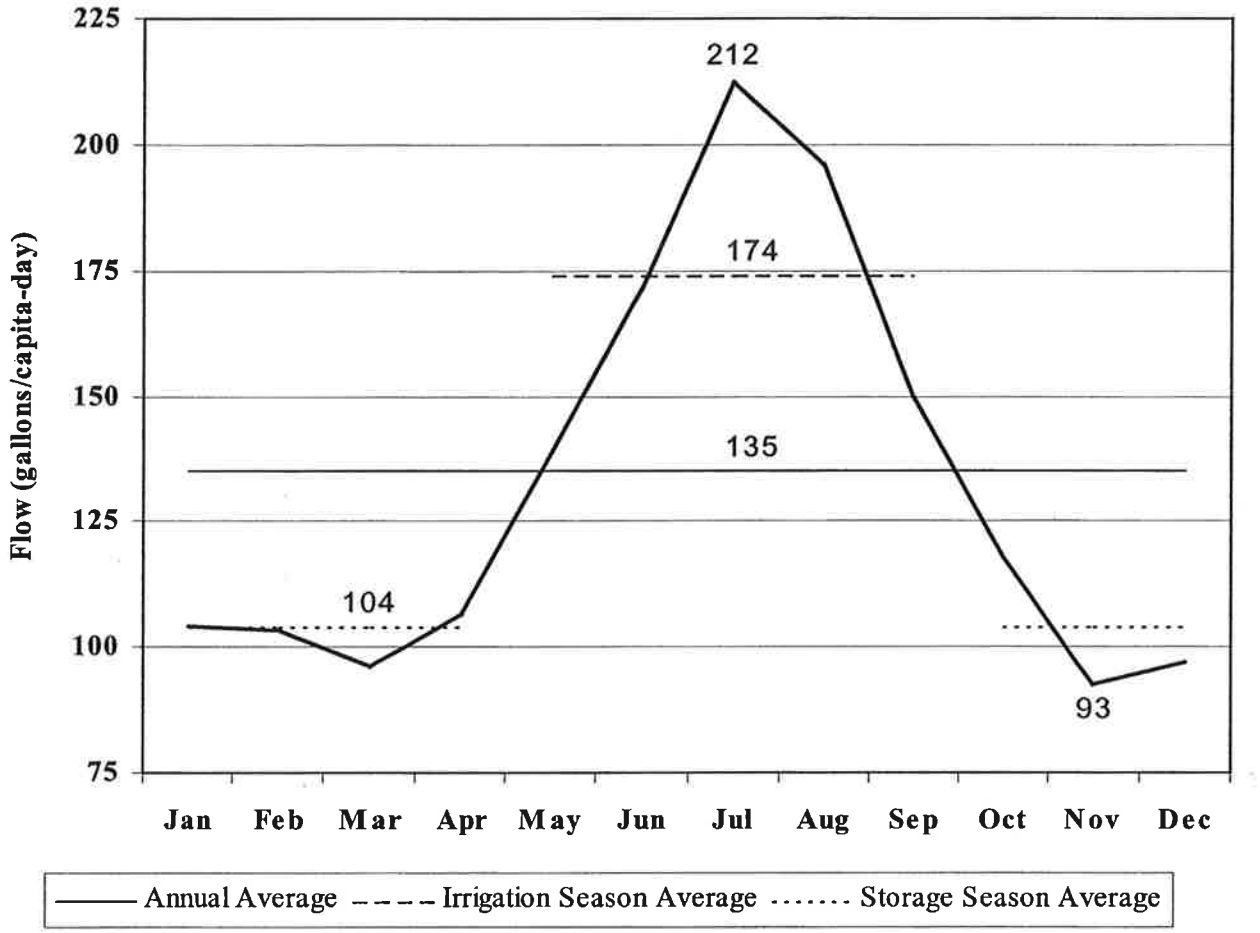


Figure 2-3 – Average Per Capita Flow (Jan-96 through Sep 2001)

The Average Wet Weather flow (AWW) is a flow used for design typically assumed to be the maximum monthly flow that the WWTF will experience during it's design period. Because the maximum monthly flow at the Breezy Point WWTF occurs each year during July, as shown in Figure 2-3, the AWW can be determined for future years by multiplying the projected total population by 212 with the following assumptions:

1. The ratio of permanent to seasonal residents will remain constant.

2. I/I will continue to not be a factor in wet weather flows.
3. The ratio of new housing units which connect to municipal sewer (as opposed to on-site treatment systems) will remain the same.
4. Sewer service is not extended to areas outside of the incorporated area of Breezy Point.

An alternate method of determining design flows was presented in the October 14, 1999 memo. This method is still viable as a flow prediction tool assuming that seasonal and permanent populations actually connected to the municipal sewer are known.

Determination of design flows can be accomplished by multiplying the appropriate per capita flow by the projected population. Figure 2-4 shows a summary of the calculated design flows over the next 20 years.

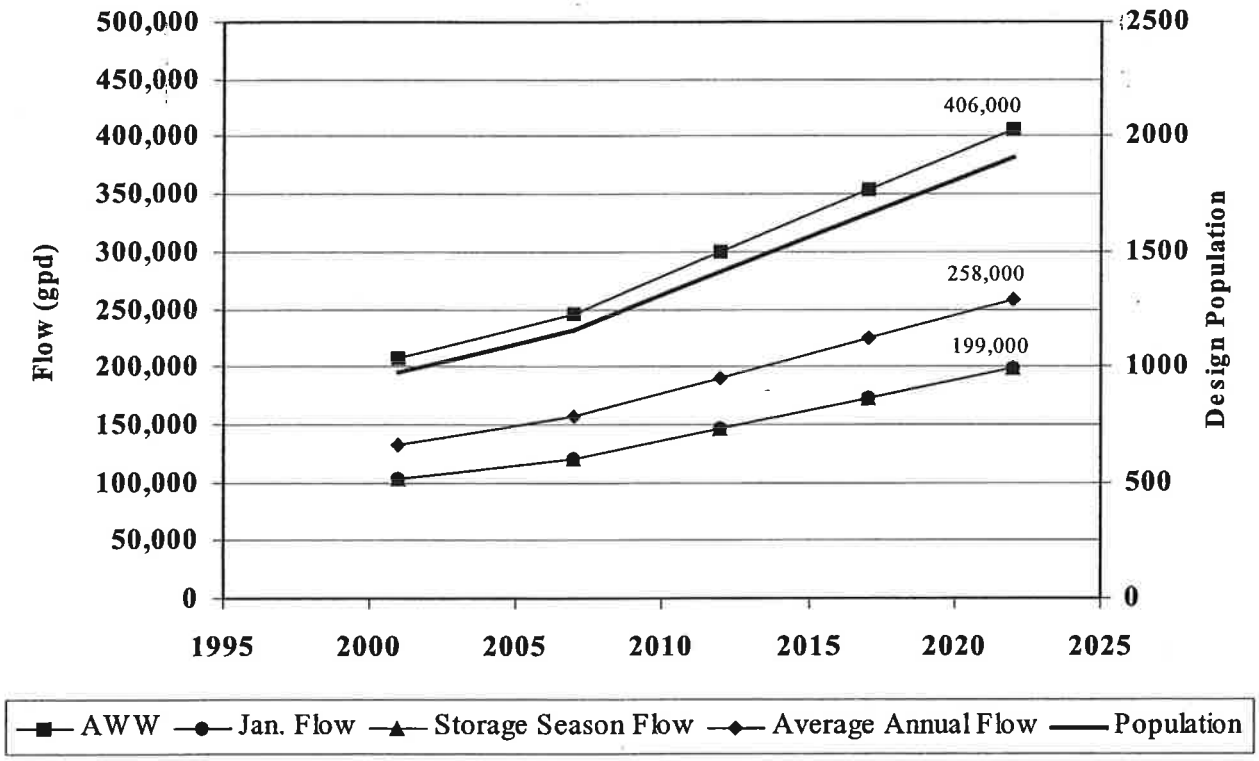


Figure 2-4 – Design Flows

One curious aspect of the flows at Breezy Point is that the January Flow and the storage season flow happen to be the same.

The peak hourly wet weather flow (PHWW) is a design flow that is used to size pumps, preliminary treatment equipment and clarifiers. PHWW is determined using a peaking factor calculated from the service population and the AWW.

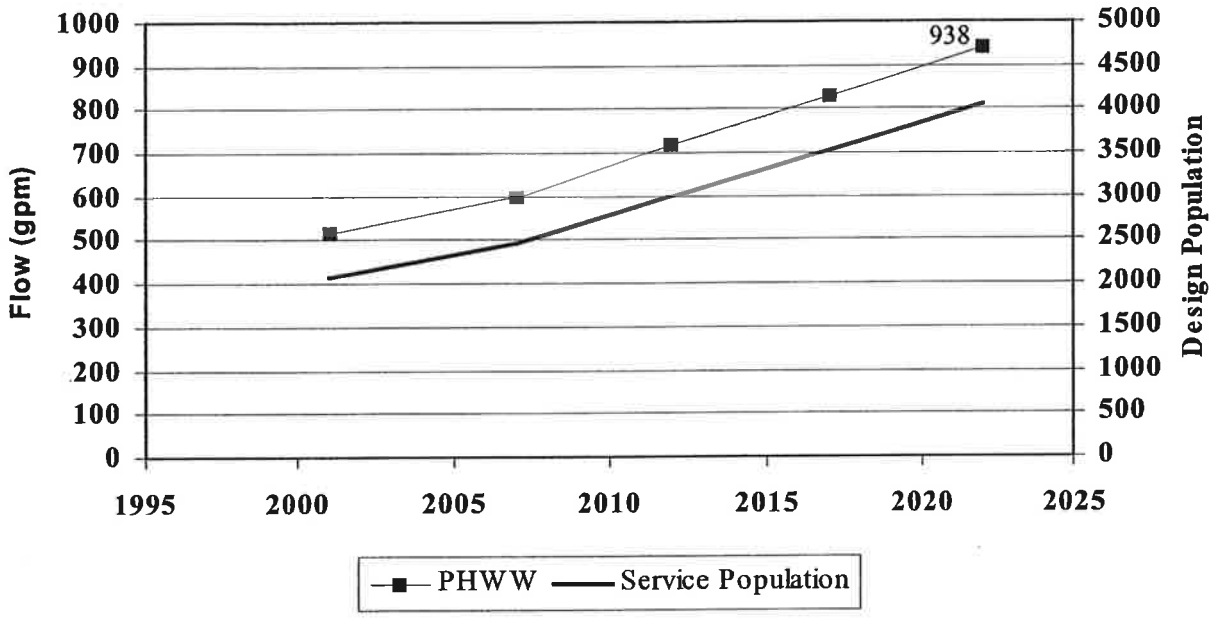


Figure 2-5 – PHWW Design Flow

As an alternative to population projections, growth can be estimated from planned growth projects. Breezy Point has several planned growth projects with the potential to occur over the next few years. Future development can be expressed in terms of equivalent residential units (ERU). Each ERU can be expected to increase the average annual flow by 275gpd and the Average wet weather flow by 400 gpd. The population projection shown in Figure 2-5 is roughly equivalent to adding 725 ERU over the next 20 years. The following developments may occur during the design life of the WWTF.

1. There are currently 200 to 250 residential sewer stubs installed but not connected.
2. The High Village development will add 144 ERU when completed. This project has not begun and was originally projected to take six years to complete.
3. The Golf Course Condos will add 500 ERU when completed. This project has not begun and was originally projected to take 22 years to complete.

4. White Birch Estates will add an additional 63 ERU.
5. A 1000 student school with cafeteria and locker room facilities could increase flows by 35,000 gpd on school days and 5,000 gpd on weekdays with no school. This would increase the AWW by only 5,000 gpd as school is not in session during July, which historically has been the month with highest flows. However, the AAF would increase by 20,000 gpd, which is approximately 75 ERU.
6. Camping Cluster II has 56 campsites left to connect. These connections will increase the AWW by 4,000 gpd, approximately 11 ERU.
7. The Sports Complex completed in 2000 is being served by a septic system. This development would add 33 ERU if the septic system fails.
8. A new, larger restaurant planned for 1998 to replace the old Marina Restaurant has not yet been built. When open, it will add 1 ERU for every additional 8 seats.

If all of these development projects occur, more than 1100 ERU will be added to the WWTF.

In addition to these planned projects, municipal sewer service could be extended to several lakeshore neighborhoods that are currently served by individual sewage treatment systems (ISTS). Lakeshore areas that developed prior to the mid-1970's were frequently constructed on lots too small to allow upgrade of ISTS due to State Rules, which have grown more restrictive in the past 30 years with respect to ISTS setbacks from lakeshore. The incorporated area of Breezy Point includes neighborhoods on Pelican Lake and Ossawinnamakee Lake that do not have municipal sewer. There are also neighborhoods in unincorporated areas on Clear Lake, Ossawinnamakee Lake, Kimble Lake, Bass Lake and Pelican Lake to which Breezy Point is the nearest potential source for municipal wastewater service.

2.5 Design WWTF Loadings

Other important parameters to consider in the evaluation and design of WWTF are the characteristics of the influent wastewater and the loadings that will be experienced at the facility. Wastewater generated in Breezy Point is almost exclusively domestic in nature. The waste should be fairly consistent in strength and character because I/I does not influence and dilute it.

Breezy Point does not have a BOD treatment requirement for discharge; however, if BOD is not removed to below 25 mg/L in the primary pond, the potential for odors in the storage ponds increases. The aerated pond was originally designed to achieve an effluent BOD concentration of 25 mg/L. On an average annual basis, this is approximately 85% removal. The influent waste will be assumed to remain at this constant strength of 167 mg/L during the 20-year design period. Table 2-3 presents the daily BOD loadings expected at this level of strength relative to the design flows.

Table 2-3 – BOD Loads

Year	July Flow (mgd)	BOD (lbs/day)	January Flow (mgd)	BOD (lbs/day)
2001	187,000	260	94,000	131
2007	246,000	343	121,000	169
2012	300,000	418	147,000	205
2017	353,000	492	173,000	241
2022	406,000	566	199,000	277

The WWTF does not have regulated treatment limits for nitrogen or phosphorus removal because it discharges all of the effluent by spray irrigation. If spray irrigation becomes impractical, other discharge options must be considered and limits on nutrient removal may become important factors in treatment.

3. EXISTING FACILITIES

3.1 Pumping Station #1

Pumping Station 1 is currently equipped with two pumps. Original pumps have recently been replaced. In 1997, a rebuilt 25 HP pump was added. The pumping rate for this pump has been measured at 530 gpm at approximately 79 feet of toal dynamic head (TDH). This is well below the design point of 500 gpm at 95 feet of total dynamic head, suggesting either a worn or smaller impeller than could be used. In 2000, a 27 HP pump with a discharge capacity of 925 gpm at 87 feet TDH was installed. At the design point on the pump curve, the motor draws more power than it is rated for; however, the draw is within the service factor for the motor. This may reduce When operated together, the two pumps have a discharge capacity of approximately 1030 gpm.

The pump down volume (the volume between the highest reasonable elevation of the "lead pump on" float and the lowest reasonable elevation of the "pumps off" float) of the Pumping Station 1 wet well is 1,692 gallons. This volume limits the existing pumping station to pumps with capacity of approximately 900 gpm. Higher capacity pumps would run for a shorter time than is desirable for submersible pumps, which would result in higher operation and maintenance costs.

The firm pumping capacity of the station is now 530 gpm. By the year 2005, peak hourly flows are projected to exceed the current firm capacity of the pump station.

A firm pumping capacity of 1.35 MGD (938 gpm) will be needed in Pumping Station #1 by 2020.

3.2 Force Main

Pumping Station 1 collects all wastewater generated in Breezy Point and pumps it through a 10-inch, 4400-ft, cast iron pipe force main. The cast iron force main has the following system head:

Table 3-1 – Force Main System Head

Discharge (gpm)	Head (ft H_2O)	Pump Size (HP)
0	66	-
200	67.3	10
400	70.5	15
600	75.6	20
800	82.3	25
1000	90.6	40
1200	100.5	50
1400	111.8	75

The maximum discharge that the existing force main could reasonably be expected to handle is about 1400 gpm. While it may be possible to find pumps which are rated for high flow, high head conditions, there are not many to select from. Most submersible pumps do not operate efficiently at heads above 120 feet.

Peak-hourly flows for the 20-year design period are not projected to be higher than 938 gpm in the design year 2020. The existing force main appears to have adequate capacity for this period.

3.3 Municipal Wastewater Treatment Facility

The existing liquid treatment train includes one aerated pond followed by three storage ponds. Treated wastewater is discharged to forested spray irrigation fields. Because wastewater is treated in a pond system, Breezy Point does not currently have or need a dedicated solids treatment train.

3.3.1 Influent Pretreatment and Control Building

The Control Building formerly housed a comminutor, and currently houses a Parshall flume and three positive displacement blowers. Upgrade of the comminutor with a mechanically cleaned bar screen and manually cleaned bypass screen was completed in 2001. A screenings rack for dewatering of screenings prior to landfill disposal was also installed as a part of that project.

A 6-inch Parshall flume measures influent flow. The flume has a maximum flow capacity of 1750 gpm at a maximum head of 1.50 feet. Peak hourly flow predicted for the 20-year design period is 938 gpm. Therefore, the existing Parshall flume should provide adequate capacity.

3.3.2 Aerated Pond

The main treatment unit at the wastewater treatment facility is the aerated pond. The pond has a depth of 10 feet and a constant volume of 5.4 million gallons. Three positive displacement blowers supply oxygen, with a firm blower capacity of 700 inlet cubic feet per minute (icfm). One of the blowers has been replaced, but two are original equipment.

3.3.2.1 Hydraulic Loading Considerations

In order to achieve 85% BOD removal, the pond must have a hydraulic detention time of 41 days during the coldest month of winter and 25 days during summer. This limits the existing pond to a maximum monthly flow rate of 0.132 mgd during January and 0.216 mgd during July. Comparing these values with the future flow projections, the July flow will exceed 0.216 mgd before 2007 when the flow is projected to be 0.246 MGD. The winter ADW flow will exceed capacity sometime before 2012 when the flow is projected to be 0.147 MGD. Based on this information, the aerated pond capacity and sizing should be evaluated and improved shortly after 2001.

3.3.2.2 Organic Loading Considerations

Assuming that 3 mg/L of dissolved oxygen is maintained in the pond, and that the BOD discharge is limited to 25 mg/L at 85 percent removal, the existing pond must be limited to a maximum monthly BOD influent load of 183 lbs/day during winter and 263 lbs/day during summer.

Projected organic loadings related to flows expected in the future show that the existing pond will reach its organic loading capacity at the same time it reaches its hydraulic loading capacity. The pond should be evaluated for expansion of capacity shortly after 2001 as dictated by the hydraulic capacity limitations. Even though Breezy Point's WWTF does not have a BOD

discharge permit, BOD loadings should be monitored to ensure the ponds maintain adequate capacity.

Organic loadings to the WWTF should continue to change at the same rate as the hydraulic loadings as long as the nature of the wastewater remains primarily domestic. However, if a significant industrial waste is added to the flows received at the WWTF, organic loading may become an important consideration.

3.3.3 Aeration Blowers

The existing aerated pond has coarse-bubble tube diffusers. They have an oxygen transfer efficiency of approximately 6%. With the three existing blowers, this means that the standard oxygen transfer rate is approximately 1050 lbs/day. In wastewater at Breezy Point, this converts to an actual oxygen transfer rate of 525 lbs/day. The MPCA requires a minimum supply of 2 pounds of oxygen for each pound of BOD loaded to the pond; therefore, the blower capacity is sufficient for treating a maximum daily load of 263 pounds of BOD per day.

The blower capacity will be exceeded shortly after 2001 when the BOD maximum monthly loading is expected to reach 260 lbs of BOD/day. In addition to this, the existing blowers are at or near the end of their useful service life.

The City currently operates the blowers an average of 8 hours per day from November through March.

The City has experimented with the use of a solar powered mixer called a Pond Doctor. Based on the data collected during the full-scale pilot study, the unit cannot furnish sufficient oxygen to maintain aerobic conditions. The City currently uses the existing aeration system for 8 hours per day from November through March and on an as needed basis from March through October.

The Pond Doctor appears to improve natural aeration (oxygen produced by algae) during sunny periods but cannot provide enough aeration to meet MPCA criteria. The evaluation of whether or not to continue the use of the Pond Doctor should be based on the energy payback realized from reduced mechanical aeration.

3.3.4 Storage Ponds

Breezy Point currently has a storage capacity of 30.7 million gallons in three storage ponds. MPCA requires a minimum of 210 days (7 months) storage capacity during non-discharge periods. This limits the wastewater flow during storage periods (October 1 to April 30) to an average of 146,200 gpd.

Flows are predicted to exceed the existing capacity of 146,200 gpd during winter storage periods about 2012, when they are expected to reach 147,000 gpd. Therefore, alternatives to improving storage capacity must be considered and evaluated before that time.

3.4 Spray Irrigation System

The original spray field at Breezy Point was permitted at an application rate of 47 inches per year; however, ponding occurred at 36 inches per year. The current NPDES permit limits irrigation to 33 inches per year. At this application rate, Breezy Point's current irrigation capacity is 70.8 mgy. This equates to 194,000 gpd. In 1998, a permit application for the Southwest Irrigation Fields was submitted to the MPCA, which will expand the total irrigated area to 110 acres. This field has not yet been approved. When the SW Irrigation Fields are approved, the capacity based on a 33-inches/year application rate will increase to 97.9 mgy, or an average annual flow of 268,200 gpd.

The capacities listed above may be reduced if more restrictive limits are adopted for spray irrigation application rates. The City of Nisswa has recently been issued a permit by the MPCA for spray irrigation. The permit includes irrigation of a golf course area. The final permitted application rate will be 13.5 inches per year. There are other spray irrigation sites in Minnesota, which have been permitted in the 15 inches per year range. The current available capacity at this application rate, including the 1998 SW Irrigation Fields expansion, would be 121,900 gpd.

At the currently permitted discharge rate with the SW Irrigation Fields included, the average annual capacity of the system should last somewhat beyond the year 2022 when the annual average flows are expected to reach 0.258 MGD. If more restrictive limits are placed on the discharge at Breezy Point WWTF, the capacity could be exceeded when the new permit is issued.

Given these considerations, the spray irrigation system capacity will need immediate consideration if more restrictive application rates are introduced. Therefore, a close watch of impending permit limits should be made and appropriate actions taken to evaluate expansion of the irrigation fields or other discharge options.

3.5 Irrigation Pumps

There are two existing irrigation pumps. One of the irrigation pumps has been replaced, but the other is original equipment, and will likely require replacement soon. The pumps are vertical turbine pumps rated for 660 gpm at 108-psi discharge head. Assuming that the system could be operated an average of 16 hours per day even during a wet summer, the total irrigation capacity would be 101.3 mgy based on the average pumping rate of the irrigation pumps with one pump out of service. The capacity for a twelve-month flow with an eight-hour day operation schedule would yield an existing capacity of 138,800 gpd average annual flows. The existing capacity could be increased to 277,500 gpd by switching to a 16-hour operating schedule.

Expansion of the capacity of the existing pumps would probably be necessary shortly after the year 2017 when the average annual flow is expected to reach 0.224 MGD.

4. WASTEWATER TREATMENT ALTERNATIVES

Any expansion of the wastewater treatment facility for Breezy Point must be capable of meeting requirements and constraints imposed by the EPA, the Minnesota Statutes and Rules, the MPCA, the City of Breezy Point and the general public. Among these requirements are:

1. Meeting effluent limits to the waters of the state as required by the State Rules and enforced by MPCA.
2. Design criteria as set forth in Ten States' Standards.
3. Sludge disposal requirements as established by the EPA and regulated by MPCA.

In addition to these legal requirements, the City and the general public will also have a list of requirements.

1. The new facility should make use of the old facility to the fullest extent practical.
2. New processes should be located on City-owned land.
3. Public nuisances such as odors, noise, traffic impedance and eyesores should be minimized.
4. The facility should be cost-effective and easy to operate with low operation and maintenance costs.

Wastewater treatment can be accomplished in two basic ways: mechanically or naturally. Natural treatment systems require more time and space than mechanical systems, but minimize the amount of human-generated energy sources required for treatment. An example of a natural system is the facultative (without aeration) stabilization ponds that are used by many small communities.

One step above stabilization ponds in terms of complexity and quality of effluent are mechanically aerated ponds. The existing treatment facility at Breezy Point falls into this category. By aerating the primary cell, the City is able to treat wastewater with considerably less land than would be required for stabilization ponds. Aerated ponds, however, are not capable of

meeting the requirements that would likely be implemented for discharge to surface water in the Breezy Point area.

Fully mechanical treatment systems offer a multitude of possibilities for wastewater treatment and disposal. Mechanical treatment systems usually consist of preliminary, primary, and secondary treatment plus separate sludge stabilization, storage and disposal. Preliminary treatment can include coarse screening, grit removal, comminution, septage handling, flow equalization and odor control. Preliminary treatment protects downstream processes, conditions the wastewater and prevents public nuisance conditions from developing at the wastewater treatment site.

Primary treatment may include sedimentation, pre-aeration, chemical coagulation, fine screening and dissolved air flotation. Primary treatment is basically solids separation and deals with capture of insoluble material suspended in the wastewater. Typically, 50 to 60% of TSS and 25 to 35% of BOD are removed with primary treatment. Many small mechanical plants do not include primary treatment as the secondary treatment systems can be cost-effectively designed without it.

Secondary treatment uses biological processes in conjunction with sedimentation to first convert soluble biodegradable materials into carbon dioxide, water and microorganisms. With a suspended-growth biological process such as activated sludge, the microorganisms are kept in suspension in a reactor to enhance contact with influent wastewater. Solids separated from the treated water are either returned to the reactor to maintain the appropriate population of microorganisms, or, if not needed, wasted to the sludge treatment process. Fixed-growth processes such as trickling filters allow microorganisms to grow on a support structure with wastewater flowing through. Solids are separated downstream and wasted to the sludge treatment process. There are many permutations of secondary treatment. Two that have been used successfully to treat wastewater in Minnesota are sequencing batch reactors (SBR) and oxidation ditches.

Sludge treatment processes are necessary to stabilize sludge wasted from secondary treatment processes. Stabilization significantly reduces pathogens (Class B) and may further reduce pathogens (Class A), depending on the treatment process selected. Class B processes that have

been used successfully in Minnesota include thermal treatment, lime treatment, anaerobic digestion, aerobic digestion, composting and air drying. Class A processes which have been used in Minnesota include heat treatment, thermophilic aerobic digestion and pasteurization. In Minnesota sludge is typically disposed of by land application.

Breezy Point has a number of options for upgrading the wastewater treatment faciltiy. This report will further consider the three options that appear to offer the most cost-effective solutions and future flexibility for the City:

Option 1 - Expansion of the existing pond system

Option 2A - Construction of a sequencing batch reactor system

Option 2B - Construction of an oxidation ditch system

Option 1 was considered in the 1999 series of memos. Information presented at that time has been updated in this report.

For option 2, sludge treatment will be required. The sludge treatment system could be the same for either of the considered secondary treatment processes.

For purposes of planning, it has been assumed that the City will wish to undertake wastewater related projects no more frequently than once every five years. All costs given in this report are applicable for 2001 construction.

4.1 Pumping Station #1 and Influent Force Main

Pumps are typically assumed to have a design life of 15 years. If it is assumed that the City must always have a firm capacity equal to the projected Peak Hourly Flows, that Pumping Station #1 will continue to be a duplex lift station, and that the pumps will have a design life of 15 years the following projects will be necessary:

Table 4-1 – Schedule for Lift Station Upgrade

Year	Project	Cost
2000	Replace existing 425 gpm/20 HP pump with 830 gpm/30HP pump	$30,000
2002	Replace impeller in 530 gpm pump (new capacity may be as much as 675 gpm	$5,000
2012	Replace 675 gpm/25 HP pump with 1040 gpm/50 HP pump Add overflow manhole to increase pump down time to 2 min. Replace 830 gpm/30 HP pump with 1040 gpm/50 HP pump	$90,000
2020+	1040 gpm/50 HP pumps can have impellers replaced as necessary to increase capacity to a maximum flow of approximately 1200 gpm	$5,000

The first project has been completed. The second is being evaluated by the operations staff along with the possibility of purchase of a new or rebuilt pump.

Upgrade of the Lift Station will be required regardless of the future expansion plans for the secondary treatment system; however, the nature of the upgrade could be different. If the secondary treatment process includes a clarifier, it may be necessary to upgrade the pumping station controls with variable frequency drives. This upgrade would allow the pumps to run at lower speeds and would protect the clarifiers from upsets caused by the on-off operation of the lift station. This type of an upgrade would cost approximately $50,000 in addition to the cost of the new pumps.

The influent force main will not require upgrade during the project design life.

4.2 Municipal Wastewater Treatment Facility

The existing liquid treatment train includes one aerated pond followed by three storage ponds. The treated wastewater is discharged to forested spray irrigation fields. Because wastewater is treated in a pond system, Breezy Point does not currently have or need a dedicated solids treatment train.

4.2.1 Preliminary Treatment Processes

4.2.1.1 Comminutor

The comminutor was replaced with a mechanical bar screen in 2001.

4.2.1.2 Bar Screen

By replacing the comminutor with a bar screen, the problems listed above can be avoided; however, the screenings will have to be disposed of in a landfill, a task which is not currently required.

Removal of screenable material should be done for aerated pond systems and is an absolute requirement for mechanical systems such as SBRs or oxidation ditches.

If the comminutor is replaced with a bar screen, it may be possible to specify a piece of equipment which will fit into the existing comminutor room; however, a building expansion will likely be necessary. The cost of a bar screen will range from $150,000 to 250,000 assuming that a building expansion is not necessary. If a building expansion is necessary, an additional $25,000 to 50,000 should be budgeted.

4.2.1.3 Grit Removal

Grit removal is not required for aerated pond systems; however, it should be installed for activated sludge systems.

Grit removal equipment could be installed downstream from a new bar screen in a building expansion. There are several options for grit removal; however, the most applicable option for Breezy Point would be a vortex grit removal system. This type of system would be capable of removing 98% of grit greater than 50 mesh (0.3 mm), 90% of grit from 50 to 70 mesh (0.22 mm) and 75% of grit from 70 to 100 mesh (0.15 mm). Aerated grit removal is an alternative to vortex grit removal. Aerated grit removal requires more space and is less efficient than vortex grit removal.

The benefit of a grit removal system is the reduction in the amount of sand discharged to the activated sludge system. This would have the effect of reducing the frequency of cleaning the concrete tanks. In addition, wear on all sludge handling pumps would be reduced.

A cost estimate is given below for a typical system.

Table 4-2 – Capital Costs for Grit Removal

Item	Cost
Demolition	$10,000
Equipment	70,000
Concrete	15,000
Installation	30,000
Building space	20,000
Subtotal	$120,000
Engineering	24,000
Project Total	$144,000

4.2.2 Secondary Treatment Processes

4.2.2.1 Option 1 – Expansion of the Aerated Pond

To meet summer design flows of 0.406 mgd and winter design flows of 0.199 mgd in 2022, an additional aerated pond 10 feet deep with a volume of 5.4 million gallons could be constructed. This additional capacity will provide summer and winter combined detention times for both ponds of 25 days and 41 days respectively for the 2022 design flows.

The new aerated pond (Pond 1a) will be approximately the same size as the existing aerated pond. It should be possible to operate the aerated ponds in parallel or series. There are two possibilities for locating Pond 1a: west of Pond 1, or in the western portion of Pond 2.

If Pond 1a is located to the west of Pond 1, approximately 4 acres of the existing spray irrigation area will be lost. If Breezy Point is allowed to continue irrigation at the currently permitted rates, the loss of area will reduce the average annual flow capacity of the irrigation sites to 258,400 gpd. This would be sufficient to serve until 2015.

If Pond 1a is located in Pond 2, approximately 7 million gallons of storage capacity will be lost. This capacity would have to be replaced immediately.

Because Breezy Point has more irrigation capacity than storage capacity, and because irrigation capacity is less expensive to replace, the most cost-effective location for Pond 1a is probably west of Pond 1. This issue should be examined more thoroughly during preliminary design.

The construction cost for Pond 1a should be $550,000 to 650,000 plus the cost of aeration equipment.

If it becomes necessary for Breezy Point to discharge to surface water in the future, it will be necessary to install chemical feed equipment and a sand filtration unit. The cost of this equipment is shown in Table 4-3

Table 4-3 – Phosphorus Removal Upgrade for Aerated Pond

Description	10-Year	20-Year
Chemical Handling Equipment	$55,000	$30,000
Sand Filter with Building	440,000	200,000
Recirculation Pumping	100,000	40,000
Subtotal	$595,000	$270,000
Contingencies	89,000	41,000
Construction Cost	$684,000	311,000
Engineering, Legal, Administrative	137,000	62,000
Total	**$821,000**	**$373,000**

4.2.2.1.1 Aeration

Two of the existing blowers are at or near the end of their useful service life. One has been recently replaced. If coarse-bubble diffusers are used in the additional pond, the total blower capacity necessary for the 20-year design period is 1,720 standard cubic feet per minute (scfm). This means that an additional 1020 scfm will be required to support the additional aerated pond. To meet this air capacity requirement, three additional blowers sized the same as the existing blowers will be necessary to provide an additional firm blower capacity of 1,050 icfm. In addition to the new blowers, two of the existing blowers are ready to be replaced.

In the years since the existing aeration system was installed, many communities have had success in aerating stabilization ponds with floating mechanical aerators or aspirators. If additional aeration is required for Pond 1, this will be the most economical option. To make up the gap between the current Pond 1 aeration capacity and the full capacity, two 5 HP floating aspirators could be installed at a cost of $10,000 to 15,000. To completely replace the aeration system in Pond 1 would require four 10 HP aspirators. This would cost $60,000 to 80,000.

When Pond 1a is constructed, it will require approximately 40 HP of floating aspirators. This would cost $60,000 to 80,000.

4.2.2.2 Option 2 - Activated Sludge

Activated sludge is the most popular mechanical wastewater treatment process. It is very flexible and can be adapted to almost any type of biological waste treatment problem. The process utilizes aeration tanks for maintaining dissolved-oxygen levels and return and waste activated sludge for maintaining biological activity. In a conventional activated sludge process, the wastewater and recycled activated sludge are mixed in the aeration tank and are aerated by diffused-air or mechanical aeration. During the aeration period, adsorption, flocculation, and oxidation of organic matter occurs. Treated water is separated from solids in a secondary clarifier before exiting the plant. Activated sludge processes produce residuals that require stabilization before land application.

For Breezy Point, selection of the activated sludge process would allow the use of the existing aerated pond for storage. The existing aeration system could be abandoned.

One advantage of some activated sludge systems is that phosphorus can be removed biologically with chemical back-up. If Breezy Point ever has the need to discharge to surface water such as a stream or lake, phosphorus removal will likely be necessary.

The two options being considered for activated sludge treatment at Breezy Point are sequencing batch reactors and oxidation ditches.

4.2.2.2.1 Process Layout

Figure 4-1 shows the existing wastewater treatment processes as they would fit into an upgrade incorporating mechanical secondary treatment. The main modifications of existing processes would be to remove all of the existing aeration equipment from Pond #1 and to reconstruct the control structure in Pond #1 to allow its use as a storage pond.

Options 2A and 2B are both shown on the diagram for purposes of comparison. Only one option would actually be selected.

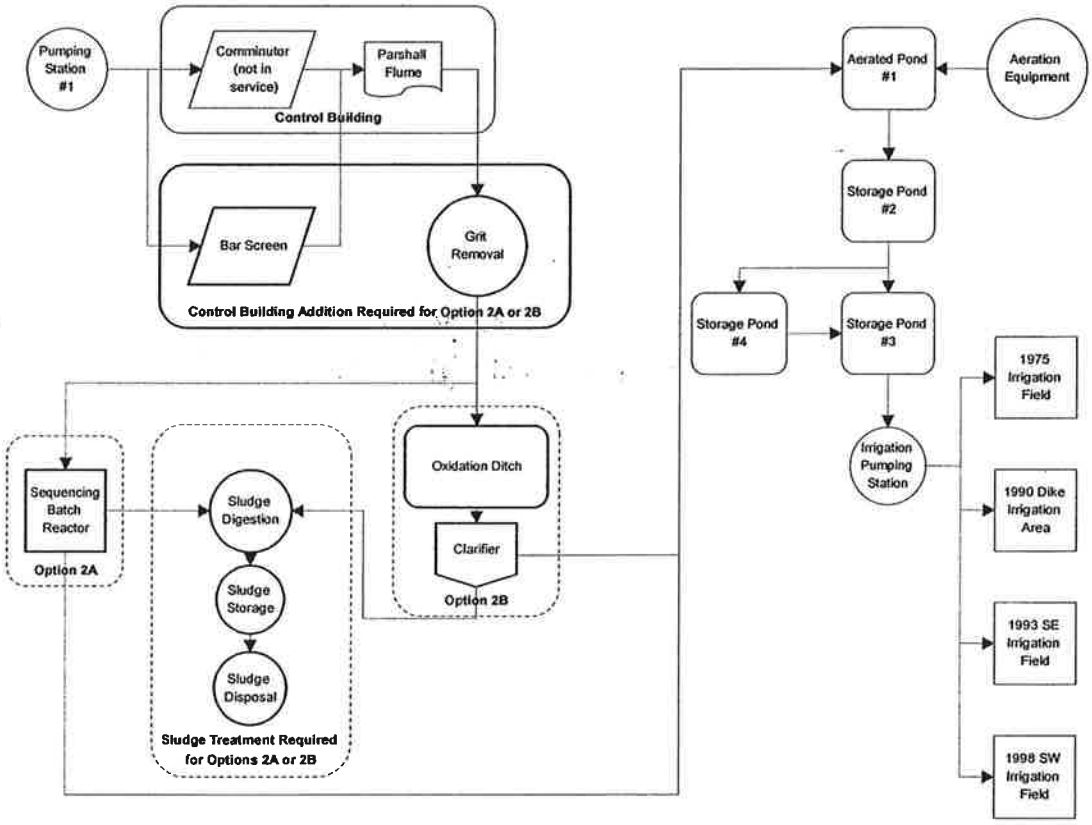


Figure 4-1 – Process Schematic

By making these revisions, the storage capacity could be increased to an average flow of 167,000 gpd during the storage period (October 1 to April 30).

4.2.2.2.2 Option 2A - Sequencing Batch Reator (SBR)

The Sequencing Batch Reactor (SBR) process involves a single, complete-mix reactor in which all steps of treatment typical for an activated sludge process occur. Separate cycle times are used for fill, react, settle, and decant. The SBR is a batch process and usually requires multiple tanks or flow equalization prior to fill. Withdrawal from an SBR is intermittent and therefore requires a flow equalization (surge) tank downstream to the SBR. For Breezy Point, the storage ponds act as a downstream flow equalization tank. Anaerobic and anoxic mixing periods required for biological nutrient removal are achieved within the same reactor by simply modifying the cycle time and controlling the air supply. SBRs operated to enhance biological phosphorus removal are capable of achieving 70 to 80% removal of phosphorus.

The SBR offers a greater amount of flexibility in both operation and planning in comparison with oxidation ditch alternatives. The SBR has high tolerance for peak flows and shock loadings, which would also be an advantage for Breezy Point given the seasonal fluctuations in flow and the intermittent flow of the influent lift station. Elimination of secondary clarifiers and RAS pumping significantly reduces the capital cost.

A two-tank SBR system could be constructed to handle the initial flow as well as the 20-year design flow. If the City wishes to stage construction, a two-tank system could be constructed initially to treat the 10-year flow with a third tank added in ten years.

SBRs produce sludge as a wastewater residual in quantities comparable to other conventional activated sludge processes and therefore, need sludge treatment facilities.

4.2.2.2.3 Option 2B - Oxidation Ditch

The oxidation ditch has been one of the most common permutations of extended aeration activated sludge applied to municipal wastewater treatment. An oxidation ditch consists of a concrete raceway type aeration basin with mechanical aeration. The two most common methods of aeration are horizontal-shaft aerators (brush aerators) and vertical-shaft aerators (surface turbines). The rotation of the aerator maintains a flow velocity sufficiently high to maintain the suspension of mixed liquor.

The oxidation ditch is simple yet rugged and efficient. It has an excellent track record of operation in Minnesota. It offers the advantage of a high degree of reliability in mechanical performance.

Like SBRs, oxidation ditches produce sludge as a wastewater residual in quantities comparable to other conventional activated sludge processes and therefore, need sludge treatment facilities.

Conventional oxidation ditches can be modified with two anaerobic cells and an anoxic cell to incorporate biological nutrient removal. The modified oxidation ditch, is capable of achieving 60%-70% TP removal. The process can also nitrify and denitrify.

The oxidation ditch is not very flexible and will not be effective in handling the fluctuation in low flows (initial operation) and high flow (20-year design). For this reason, it would be necessary to stage construction of the oxidation ditches. The initial project would consist of two ditches and two clarifiers sized to handle the 10-year design flow. In year 10, a third ditch and clarifier could be added to allow the system to treat the 20-year design flow.

Of the systems considered, the oxidation ditch has the highest capital construction cost, due to the large concrete basins which must be constructed for the clarifiers as well as the aeration tank. Grit removal is necessary to prevent excessive wear on the mechanical aerators and to avoid deposition in the aeration tanks.

4.2.2.2.4 Capital Cost Comparison

Table 4-4 details the capital costs associated with the secondary treatment processes discussed above. These costs do not include the cost of preliminary, primary and sludge treatment upgrades. They are presented here for purposes of comparison. Detailed project costs are given later in Chapter 4.

Table 4-4 – Capital Costs for Option 2A and 2B

Item	SBR		Ox. Ditch	
	10-yr	20-yr	10-yr	20-yr
Aeration Tank				
Equipment	$260,000	$130,000	$220,000	$145,000
Installation	150,000	80,000	110,000	70,000
Concrete	185,000	90,000	130,000	70,000
Clarifier				
Equipment			120,000	60,000
Installation			55,000	25,000
Cover			30,000	15,000
Concrete			70,000	35,000
Yard Piping	50,000	20,000	70,000	40,000
Electrical/Controls	200,000	50,000	150,000	30,000
Control/Blower Building	200,000		200,000	
Subtotal	$1,045,000	$370,000	$1,155,000	$490,000
Contingencies	157,000	56,000	173,000	74,000
Construction Cost	$1,202,000	$426,000	$1,328,000	$564,000
Engineering, Legal, Administrative	240,000	85,000	266,000	113,000
Total	**$1,442,000**	**$511,000**	**$1,594,000**	**$677,000**

Contingencies are included at a rate of 15% of the subtotal of equipment and installation costs. Engineering, legal and administrative costs include preparation of plans and specifications, costs associated with bidding, costs associated with bonding, construction observation and time required for administrative functions of the City associated with this project. These costs are estimated to be 20% of the construction contract total.

4.2.2.2.5 Operation and Maintenance Costs Comparison

Operation and maintenance costs for the two options should be similar. Both options will produce similar quantities of waste sludge. Both options will require more personnel for operation of the process and maintenance of the equipment. Projections for annual O&M costs are given in detail late in Chapter 4.

4.2.3 Sludge Treatment Process

The existing system does not require a sludge treatment process other than dredging ponds as sludge accumulates to depths above 18 to 24 inches. Typically, this is done every 20 to 40 years, depending on how close the system is operated to capacity.

A new secondary treatment process will produce sludge in quantities of approximately 1 lb per 1000 gallons of wastewater treated. At this production rate, the system will require sludge treatment for the quantities of sludge shown in Table 4-5.

Table 4-5 – Sludge Production

Year	Daily Volume @ 2.5% solids (gal/day)	Annual Production (T/yr)
2007	753	29
2012	911	35
2017	1074	41
2022	1237	47

Stabilization of the sludge is an important step before final disposal by land application. Stabilization can be designed and operated to achieve Class A or Class B categorization. Class B systems stabilize sludge with a Process to Significantly Reduce Pathogens (PSRP). PSRPs reduce fecal coliform bacteria to less than 2 million MPN per gram of total solids (dry weight basis). Class A systems stabilize sludge with a Process to Further Reduce Pathogens (PFRP). PFRPs reduce fecal coliform bacteria to less than 1000 MPN per gram of total solids (dry weight basis).

Class A sludge that is also categorized as "exceptional quality" (EQ) is not subject to the EPA Part 503 general requirements and management practices for land application. Its use following processing is unrestricted.

Class B sludge is subject to site restrictions on crop harvesting, animal grazing and public access for a certain period of time following land application. The area required for land application depends on the available nitrogen in the sludge, the type of soil in the field, the type of crop grown and, most importantly, the quantity of setbacks, wetlands and sloped areas. Breezy Point would require between 40 and 120 acres of agricultural land for land application of liquid sludge.

Typically, for quantities of land this small, land can be acquired through agreements with local farmers.

As an alternative to liquid sludge processing, Reed Beds are a simple way of treating and storing sludge which has gained popularity for small communities in Minnesota. Reed Beds generate Class B sludge. The reed bed process combines the use of common reed plants (phragmites communis) and a conventional under-drained sand bed. During warm months, the reeds grow in the sand bed and enhance dewatering and stabilization of the wastewater biosolids in three ways. First, root and stem growth penetrate the sludge and provide drainage pathways. This allows more rapid gravity drainage and prevents clogging of the sand layer. Second, the root structure increases the area of contact between the atmosphere and sludge. This increases evaporation. Finally, the plants take up water through their roots and evapo-transpire to the atmosphere through their emergent portions.

Stabilization of the biosolids is enhanced by reeds as well. The stem and root zone, or rhizosphere, provide a conduit for oxygen to the subsurface layers of biosolids. This provides a environment which can support a population of aerobic and facultative micro-organisms. These micro-organisms mineralize organic matter in the sludge to H_2O, CO_2, and N_2. This reduces the volatile solids percentage and total nitrogen. Typically, sludge with a volatile solids concentration of 60% when applied will have a VSS of 25% when removed. This amounts to a 35% reduction in biosolids on a dry weight basis.

During the winter, the reeds are dormant and, therefore, will not take up water and nutrients. Biological activity in the rhizosphere also ceases; therefore, further stabilization of the sludge will be limited. However, due to the severely cold temperatures experienced in Minnesota during winter, it is possible to dewater by freezing and thawing the sludge. The solids concentration of sludge immediately following thawing will be 20-25%.

Under-drainage is collected and pumped to the head of the secondary treatment process. Typically, sludge can be applied to a single reed bed for 7 to 10 years before it is necessary to abandon the bed or remove the dried sludge solids for permanent disposal to farmland.

Sludge loading rates for the reed beds vary depending on the sludge stabilization process. Aerobic sludge is more amenable for reed beds dewatering than anaerobic sludge. Chemical-laden sludge further limits the solids loading rate. For aerobic sludge, a loading rate of 8-10 lbs/sf-yr is typically used. For anaerobic sludge, reed beds loading rate of 5 to 8 lbs/sf-yr is more common. Initially, an appropriate loading rate for Breezy Point would be 10 lbs/sf-yr. If a surface discharge becomes necessary in the future, the loading rate would need to be reduced to 8 lbs/sf-yr. At this loading rate, the City would need 8,000 sf of reed bed cells for the 10-year design. To improve the dewatering capabilities and to facilitate effective subnatant collection, a cluster of 2 reed beds each with a surface area of 4,000 sf could be constructed initially. In Year 10, additional cells could be constructed to handle the additional biosolids and chemical sludge if necessary. In addition to the reed bed cells, a 60-day storage tank with mechanical mixing and two submersible lift stations would also be required. There would be no advantage to staging construction of the storage tank due to its small size.

Capital costs associated with reed beds are presented in Table 4-6. There are other methods of storing, stabilizing and disposing of sludge; however, there is not another alternative which will be significantly less expensive on a capital or O&M costs basis. If the City wishes to produce a Class A product for distribution, capital costs will increase.

Table 4-6 – Capital Costs for Sludge Processing

Item	Cost	
	10-year	20-year
Sludge Storage Tank	$95,000	
Reed Beds		
Gravel	17,000	$17,000
Sand	4,000	4,000
Earthwork	12,000	12,000
Perforated Pipe	8,000	8,000
Manifold	5,000	5,000
Reeds installation	30,000	30,000
Concrete	100,000	100,000
Liner	8,000	8,000
Valves	6,000	6,000
Distribution Piping	8,000	8,000
Subnatant lift station	60,000	
Reed Bed Pump Station	60,000	
Subtotal	$413,000	$181,000
Contingencies	62,000	27,000
Construction	$475,000	$208,000
Engineering, Legal, Administrative	95,000	42,000
Total	**$570,000**	**$250,000**

4.2.4 Storage Ponds

Additional storage will be required to allow the City to maintain 210 days of storage during winter months beyond 2010. The exact amount of storage which should be constructed will need to be determined at that time. The current extent of the City property includes only one area which is not currently being used and which would be suitable for a storage pond. It is located north of Pond 4. This area is lower than the other ponds and is adjacent to some wetland areas, but could potentially be used to construct a new pond with a storage capacity of 9 million gallons. This would give the City storage capacity in excess of what would be required in 2020. The cost of constructing this new pond would be $550,000 to 650,000. If the City constructs new secondary treatment facilities, the existing aerated pond can be converted for use as storage. This would reduce the required amount of additional storage.

4.2.5 Spray Irrigation Fields

It is not possible with the current information to accurately project the service life of the existing irrigation fields. The City should be aware of the potential problems associated with reduced application rates and take opportunity to purchase additional adjacent land as it becomes available. For each 40-acre parcel of land, the City can expect to get about 20 to 25 acres of irrigable land. The cost for each 40-acre site will range from $300,000 to 450,000 depending on the cost of the land, the type of labor used and the actual amount of irrigable land.

4.2.6 Spray Irrigation Pumps

The spray irrigation pumps have sufficient capacity to treat the average annual flow for the next 20 years. The capacity of the irrigation pumps should be evaluated when it becomes necessary to expand or improve the existing spray irrigation fields, which may be immediately necessary.

As with the expansion of the irrigation fields, the pump sizing necessary in 2015 is difficult to predict now and additional flow projections will be required at that time. It will be necessary to replace one of the pumps in the near future as it is near the end of its service life. Replacement of this pump will cost $20,000 to 40,000.

4.3 Financial Analysis

4.3.1 Capital Costs

Table 4-7 shows capital costs for the three options previously discussed. The aerated pond option assumes that surface discharge—and therefore phosphorus removal—will not be required in the future. If it were required immediately, the capital costs would increase by $821,000 for the 10-year design and $373,000 for the 20-year design. The range given for the total reflects this increase. In actuality, it is possible that it will not be necessary for many years, if ever, for the City to discharge to surface water.

Table 4-7 – Capital Cost Comparison (10-Year Design)

Description	Aerated Pond	SBR	Ox. Ditch
Pumping Station and Influent Force Main	$35,000	$35,000	$85,000
Preliminary Treatment			
Bar Screen	250,000	250,000	250,000
Grit Removal		144,000	144,000
Secondary Treatment System	810,000	1,442,000	1,594,000
Sludge Treatment		570,000	570,000
Storage Ponds			
Spray Irrigation Fields	450,000		
Spray Irrigation Pumps	40,000	40,000	40,000
Total	**$1,585,000 to $2,406,000**	**$2,481,000**	**$2,683,000**

If the flow increases as projected previously, another upgrade will be necessary in approximately 2012. Table 4-8 shows the capital costs for the three options for the upgrades necessary at that time.

Table 4-8 – Capital Cost Comparison (20-Year Design)

Description	Aerated Pond	SBR	Ox. Ditch
Pumping Station and Influent Force Main	$90,000	$90,000	$90,000
Preliminary Treatment			
Bar Screen			
Grit Removal			
Secondary Treatment System		511,000	677,000
Sludge Treatment		250,000	250,000
Storage Ponds	650,000	550,000	550,000
Spray Irrigation Fields	450,000	450,000	450,000
Spray Irrigation Pumps			
Total	**$1,190,000 to $1,563,000**	**$1,851,000**	**$2,017,000**

4.3.2 Operation and Maintenance Costs

A cost comparison summary O&M costs for the initial, 10th year and 20th year of operation is given in the following three tables. Again, the range given for the aerated pond option reflects the additional costs associated with chemical addition for phosphorus removal.

Table 4-9 – O&M Costs (Initial Year)

Description	Aerated Pond	SBR	Ox. Ditch
Salaries and Benefits	$93,000	$93,000	$93,000
Utilities	8,900 to 9,200	6,900	7,900
Chemicals	0 to 21,000	1,000	1,000
Equip. Maintenance and Repair	14,200 to 21,300	15,700	17,300
Depreciation	47,800 to 82,000	79,100	86,200
Outside Services	4,400	4,400	4,400
Administrative	7,800	7,800	7,800
Misc.	13,700	13,700	13,700
Total	**$189,800 to 252,400**	**$221,600**	**$231,300**

Table 4-10 – O&M Costs (Year 10)

Description	Aerated Pond	SBR	Ox. Ditch
Salaries and Benefits	$106,000	$106,000	$106,000
Utilities	12,000 to 12,400	9,100	10,500
Chemicals	0 to 27,700	1,400	1,400
Equip. Maintenance and Repair	23,100 to 33,800	26,200	28,500
Depreciation	79,800 to 131,100	130,600	136,600
Outside Services	4,400	4,400	4,400
Administrative	8,900	8,900	8,900
Misc.	13,700	13,700	13,700
Total	**$247,900 to 338,000**	**$300,300**	**$310,000**

Table 4-11 – O&M Costs (Year 20)

Description	Aerated Pond	SBR	Ox. Ditch
Salaries and Benefits	$122,000	$122,000	$122,000
Utilities	15,600 to 16,100	11,700	13,600
Chemicals	0 to 29,100	2,000	2,000
Equip. Maintenance and Repair	23,100 to 33,800	26,200	28,500
Depreciation	79,800 to 131,100	130,600	136,600
Outside Services	4,400	4,400	4,400
Administrative	10,200	10,200	10,200
Misc.	13,700	13,700	13,700
Total	**$268,800 to 360,400**	**$320,800**	**$331,000**

4.3.3 Cost-Effective Analysis

The cost-effective analysis of the three options follows guidelines established by the EPA and MPCA. Costs include estimated capital, operation, maintenance, replacement and salvage values. All costs are presented in terms of present worth value with the following assumptions:

1. The service life of various components are assumed to be:
    a. Land – permanent
    b. Concrete, masonry and earthen structures – 40 years
    c. Piping systems – 40 years
    d. Mechanical process equipment – 20 years
    e. Electrical, HVAC and auxiliary equipment – 20 years
2. The design period is 20 years
3. The time-value of money is 6%
4. Inflation is not applied to future costs. Inflation should be considered on an annual basis when connection and user fees are established.

The benchmark for costs presented here can be based on the Engineering News Record construction cost index (Oct 2001 = 6396.50)

Table 4-12 summarizes the cost-effective analysis.

Table 4-12 – Cost-Effective Analysis

Item	Aerated Pond	SBR	Ox. Ditch
1. Initial Construction	$1,585,000 to 2,406,000	$2,481,000	$2,683,000
2. Present Worth O&M Cost	2,634,000 to 3,440,000	3,119,000	3,244,000
3. Future Construction	1,190,000 to 1,563,000	1,851,000	2,017,000
4. Present Worth of Future Construction	653,000 to 858,000	1,016,000	1,107,000
5. Salvage Value	-1,500,000 to -1,687,000	-2,236,000	-2,472,000
6. Present Worth of Salvage Value	-452,000 to -508,000	-673,000	-745,000
Total Present Worth (1+2+4+6)	**$4,420,000 to 7,212,000**	**$5,943,000**	**$6,289,000**

The cost-effective analysis shows clearly what is obvious from the capital cost estimates and O&M cost estimates: expansion of the existing system is the most cost-effective alternative. It is not surprising that this is the conclusion, given the fact that expansion of the existing system has lower capital and O&M costs than the other alternatives considered. The main advantage of the activated sludge alternatives is that they are applicable for phosphorus removal and discharge to surface water if that becomes a requirement in the future.

The existing system cannot be economically upgraded to allow discharge to surface water at the discharge standards that would likely be required. If phosphorus removal and surface water discharge becomes necessary in the future after the aerated ponds have been upgraded, it will be necessary to add chemical addition and sand filtration equipment to meet the standards. This type of system would commit the City to higher O&M costs (due primarily to the cost of phosphorus removal chemicals) than either of the activated sludge alternatives. The higher numbers for the aerated pond cost-effective analysis reflect these costs for a system discharging 100% to surface water.

In summary, if the City were required to construct a surface water discharge immediately, and discharge 100% to surface water, the aerated pond option would not be cost-effective. The longer the time until the City has to construct a surface water discharge, and the higher the percentage of

water which continues to be spray irrigated, the more cost-effective the aerated pond option becomes.

5. IMPLEMENTATION SCHEDULE

5.1 Assumptions

The assumptions made in preparing Table 5-1 are listed below:

1. Growth will occur as outlined previously.
2. The ratio of seasonal to permanent residents will remain the same.
3. Construction projects will be scheduled no more frequently than once every 5 years.
4. All construction projects can be completed during the same season in which they are begun.
5. Construction contingencies at a rate of 15% and engineering, legal and administrative costs are included in the estimates at a rate of 20% of construction costs.
6. Spray irrigation will continue to be allowed at a rate of 33 inches/year.

5.2 Recommended Plan and Schedule

Table 5-1 summarizes the cost and scope of the projects which should be planned for over the next 20 years.

Table 5-1 – Project Schedule

Year	Scope	Cost
2002	1. Construct new bar screen to replace comminutor 2. Replace aeration in Pond 1 3. Construct Pond 1a 4. Install aeration in Pond 1a 5. Replace spray irrigation pump 6. Replace impeller in 530 gpm pump	$1,585,000
2012	7. Replace 675 gpm/25 HP pump with 1040 gpm/50 HP pump 8. Replace 830 gpm/30 HP pump with 1040 gpm/50 HP pump 9. Add overflow manhole at Lift Station 1 10. Construct storage Pond 11. Construct additional spray irrigation fields	$1,190,000

5.3 Actions Required to Implement the Plan

The following actions by the Breezy Point City Council will be required to implement the plan discussed above.

1. ***Review the assumptions and suggest revisions to the assumptions where appropriate.*** For example: more or less growth may be desirable, scheduling of construction activities can be revised, etc.

2. ***Determine whether or not to pursue state PFA funding.*** Low-interest loans may be available for part or all of the work. Securing a low-interest loan will require MPCA approval of the Facilities Plan. The Facilities Plan must be submitted to MPCA by April 12, 2002 in order to secure funding for 2003 construction. For small projects, the cost of securing the loan (additional cost of Facilities Plan, cost of payroll reporting and prevailing wages during construction) will outweigh the benefit of the loan.

3. ***Order operator to evaluate equipment identified as nearing the end of its service life.*** One lift station pump, one spray irrigation pump and the existing aeration equipment may need replacement in the near future. The operator can make a judgment based on O&M experience as to the urgency of replacing each item. If a substantial construction project is

implemented soon, it will be more cost-effective to replace this equipment as a part of that project.

4. ***Order preparation of Facilities Plan (if applicable).*** All of the work presented in this Engineering Report is applicable to a Facilities Plan. A Facilities Plan will also include additional information required by the MPCA. MFRA can prepare a scope of services for either alternative.

5. ***Review and update Sewer Service fees.*** The City should be sure that future growth will continue to pay for necessary expansions of the WWTF. User fees should continue to pay for operation and maintenance costs.

6. ***Order preparation of plans and specifications for 2002 projects.*** If the City decides not to pursue PFA funding, MFRA can begin preparation of plans and specifications for construction in 2002. If the City does decide to pursue PFA funding, the City should wait until after the Facilities Plan receives MPCA approval before ordering plans and specifications for construction in 2003.

7. ***In 2010, re-evaluate growth and develop a final plan for the next phase of the project.*** The City should continue to plan for the costs described above; however, the detailed design of each future project will vary as the City's growth varies from projections.

TO: Mayor and City Council

FROM: Joe Zierden, Public Works Supervisor

RE: Terminal Ln and Red Oak Ln Sewer Extensions

DATE: May 21, 2024

Background:

A feasibility study to extend sewer service from manhole 107 on Airport Road to Terminal Rd and Red Oak Ln was completed by Widseth. The intention of the study was to investigate providing trunk sewer service to Terminal Ln and possibly Red Oak Ln, while identifying the approximate number of commercial and residential lots on each road that could be served in the future. The impetus for the feasibility study is the possible construction of a new commercial structure off Red Oak Ln and Terminal Rd. Both roads identified in the 2010 comp plan as potential expansion areas. A major benefit of providing sewer service is percentage of impervious coverage increases from 25% to 50% on lots that are served with sewer. Of the approximate 58 remaining commercial zoned lots in Breezy Point that do not have city sewer service this project could facilitate future sewer service to 43 of those lots.

A trunk line is a sewer line that serves to collect sewer from broader areas. The trunk lines would terminate at the intersection. It would allow future sewer service to extend approximately 1395 feet down Terminal Lane and approximately 700 feet down Red Oak Lane if desired. Options 1 and 2 address a trunk line extension to Terminal Road, while options 1A and 2A extend the trunk line to Terminal Road and Red Oak Ln.

As a trunk line, city cost participation can help gain support for sewer line extension that may serve a greater area in the future. Looking at the cost splits by lot count is included in option 1 and 2. Splitting costs by ERU (equivalent residential units) is an alternative cost split that would be based on estimated water usage and is included in option 1A and 2A, this cost could vary based on proposed structure/ERU evaluation.

Option 1:

Trunk line with city cost participation with remaining cost split amongst lots that could be potentially served on the remainder of Terminal Road.

- Potential number of Terminal Road commercial lots that could be served in future = **22**

- Potential number of Terminal Road residential lots that could be served in future = **22**
- City Cost = **$169,341.28**
- Developer Cost = **$63,502.98**
- Total Cost = **$232,844.26**

Option 1A:

Trunk line with city cost participation with remaining cost split amongst lots that could be potentially served on the remainder of Terminal Road and Red Oak Lane.

- Potential number of Terminal Road commercial lots that could be served in future = **22**
- Potential number of Terminal Road residential lots that could be served in future = **22**
- Potential number of Red Oak Lane commercial lots that could be served in future = **21**
- Potential number of Red Oak Lane residential lots that could be served in future = **5**
- City Cost = **$238,631.55**
- Developer Cost = **$78,014.16**
- Total Cost = **$316,645.71**

Option 2:

Trunk line with city cost participation with remaining cost split by ERU that could be potentially served on the remainder of Terminal Road.

- Potential number of commercial lots that could be served in future =
- Potential number of residential lots that could be served in future =
- City Cost = **$212,866.18**
- Developer Cost = **$19,958.08**
- Total Cost = **$232,844.26**

Option 2A:

Trunk line with city cost participation with remaining cost split by ERU that could be potentially served on the remainder of Terminal Road and Red Oak Lane

- Potential number of Terminal Road commercial lots that could be served in future = **22**
- Potential number of Terminal Road residential lots that could be served in future = **22**
- Potential number of Red Oak Lane commercial lots that could be served in future = **21**
- Potential number of Red Oak Lane residential lots that could be served in future = **5**
- City Cost = **$299,374.12**
- Developer Cost = **$17,271.58**
- Total Cost = **$316,645.71**

Option 5:

No action

Option 6:

Further negotiate with the developer to reach a cost share agreement acceptable to the developer and the city.

Option 7:

100% percent assessment to benefiting property owners.

Requested Action:

A motion to select one of the above options would be appreciated.

Option 1

PRELIMINARY ASSESSMENT CALCULATIONS - EXCLUDING RED OAK LANE - LOT BREAKOUT			
#1	**COUNTY ROAD 11 TRUNK LINE - AIRPORT ROAD TO TERMINAL ROAD**		
	TOTAL LOTS		44
	TOTAL LOTS WITH FUTURE SEWER CONNECTION		33
	TOTAL LOTS TO BE ASSESSED		1
	PROJECT COST		$232,844.26
	ASSESSMENT COST PER LOT	$232,844.26/44 =	$5,291.91
	HARDWARE STORE PROPERTY ASSESSMENT COST	(12 LOTS)	$63,502.98
	CITY COST		$169,341.28
#2	**TERMINAL ROAD - APPROXIMATELY 1395 LF**		
	TOTAL LOTS		44
	PROJECT COST		$991,437.44
	ASSESSMENT COST PER LOT	$991,437.44/44 =	$22,532.67
	HARDWARE STORE PROPERTY ASSESSMENT COST	(11 LOTS)	$247,859.36
	TOTAL HARDWARE STORE PROPERTY ASSESSMENT COST		$311,362.34

Option 1A

PRELIMINARY ASSESSMENT CALCULATIONS - LOT BREAKOUT			
#1	**COUNTY ROAD 11 TRUNK LINE - AIRPORT ROAD TO RED OAK LANE**		
	TOTAL LOTS		69
	TOTAL LOTS WITH FUTURE SEWER CONNECTION		52
	TOTAL LOTS TO BE ASSESSED		17
	PROJECT COST		$316,645.71
	ASSESSMENT COST PER LOT	$316,645.71/69 =	$4,589.07
	HARDWARE STORE PROPERTY ASSESSMENT COST	(17 LOTS)	$78,014.16
	CITY COST		$238,631.55
#2	**TERMINAL ROAD - APPROXIMATELY 1395 LF**		
	RED OAK LANE - APPROXIMATELY 700 LF		
	TOTAL LOTS		69
	PROJECT COST		$1,143,738.16
	ASSESSMENT COST PER LOT	$1,143,738.16/69 =	$16,575.92
	HARDWARE STORE PROPERTY ASSESSMENT COST	(17 LOTS)	$281,790.56
	TOTAL HARDWARE STORE PROPERTY ASSESSMENT COST		$359,804.72

Option 2

PRELIMINARY ASSESSMENT CALCULATIONS - EXCLUDING RED OAK LANE			
#1	**COUNTY ROAD 11 TRUNK LINE - AIRPORT ROAD TO TERMINAL ROAD**		
	TOTAL FUTURE SERVICABLE ERU's		35
	TOTAL LOTS TO BE ASSESSED		1
	TOTAL ASSESSED ERU'S		3
	PROJECT COST		$232,844.26
	ASSESSMENT COST PER ERU	$232,844.26/35 =	$6,652.69
	HARDWARE STORE PROPERTY ASSESSMENT COST	(3 ERU's)	$19,958.08
	CITY COST		$212,886.18
#2	**TERMINAL ROAD - APPROXIMATELY 1395 LF**		
	TOTAL ERU's		35
	PROJECT COST		$991,437.44
	ASSESSMENT COST PER ERU	$991,437.44/35 =	$28,326.78
	HARDWARE STORE PROPERTY ASSESSMENT COST	(3 ERU's)	$84,980.35
	TOTAL HARDWARE STORE PROPERTY ASSESSMENT COST		$104,938.43

Option 2A

PRELIMINARY ASSESSMENT CALCULATIONS			
#1	**COUNTY ROAD 11 TRUNK LINE - AIRPORT ROAD TO RED OAK LANE**		
	TOTAL FUTURE SERVICABLE ERU's		55
	TOTAL LOTS TO BE ASSESSED		1
	TOTAL ASSESSED ERU'S		3
	PROJECT COST		$316,645.71
	ASSESSMENT COST PER ERU	$316,645.71/55 =	$5,757.19
	HARDWARE STORE PROPERTY ASSESSMENT COST	(3 ERU's)	$17,271.58
	CITY COST		$299,374.12
#2	**TERMINAL ROAD - APPROXIMATELY 1395 LF** **RED OAK LANE - APPROXIMATELY 700 LF**		
	TOTAL ERU's		55
	PROJECT COST		$1,143,738.16
	ASSESSMENT COST PER ERU	$1,143,738.16/55 =	$20,795.24
	HARDWARE STORE PROPERTY ASSESSMENT COST	(3 ERU's)	$62,385.72
	TOTAL HARDWARE STORE PROPERTY ASSESSMENT COST		$79,657.30