

THIS REPORT AND ANY INFORMATION OR REVISIONS THEREON WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
JOSEPH DUBEL  
DATE: 01/09/2024, LIC. NO. 4550

DATE	REVISION DESCRIPTION	BY

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

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

SHEET NO.  
**APPENDIX A**

**FIGURE 3: EXISTING CONDITIONS**

Breezy Point WWTF

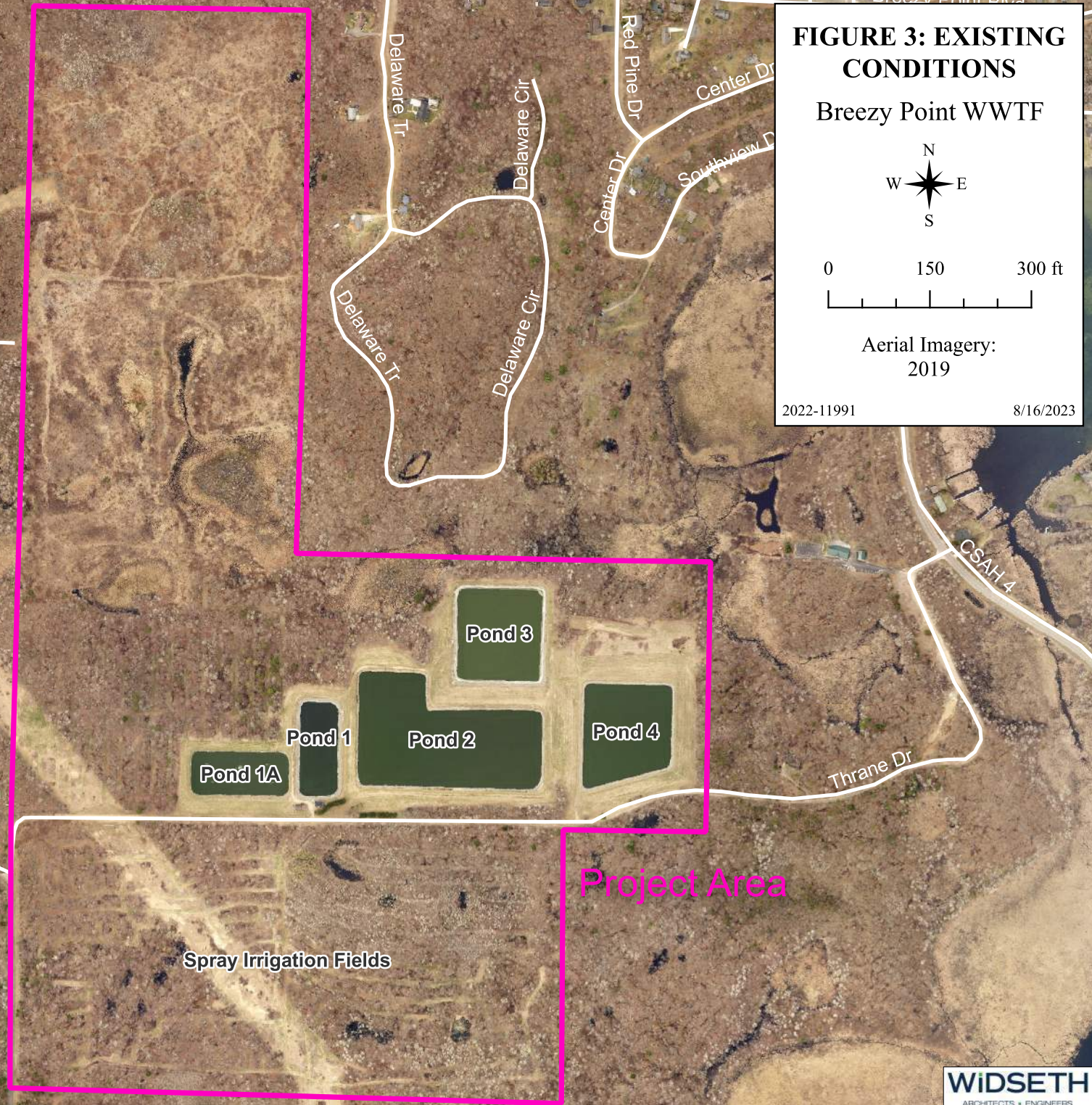
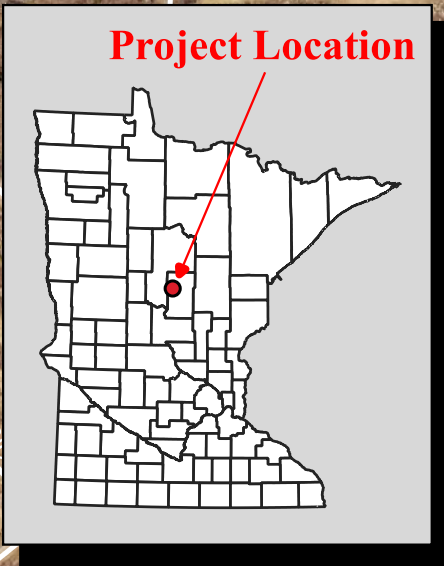


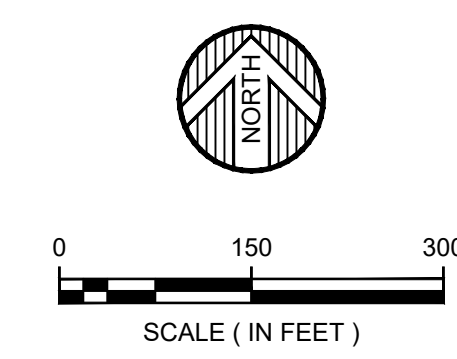
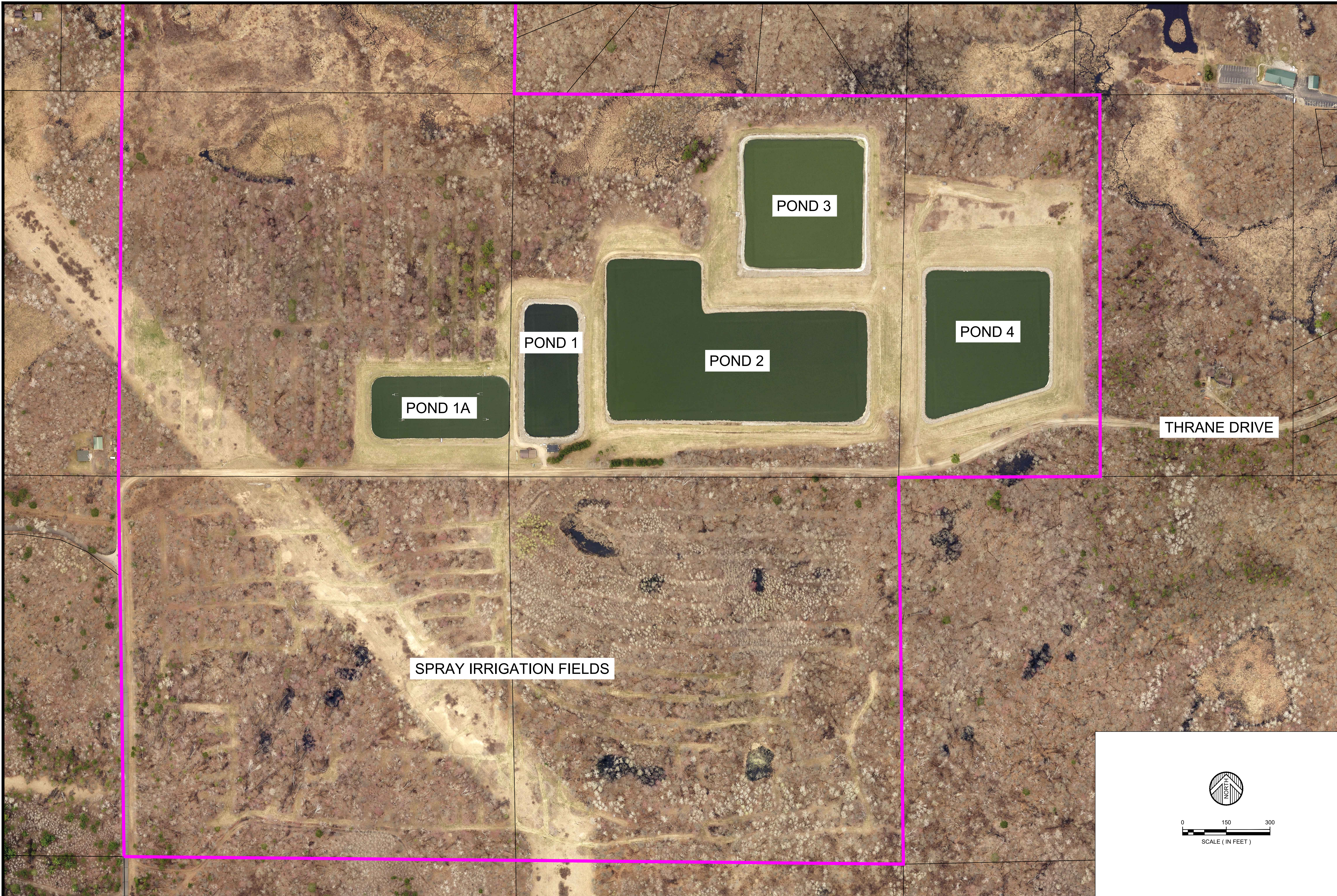
0 150 300 ft

Aerial Imagery:  
2019

2022-11991

8/16/2023





BY: \_\_\_\_\_  
REVISIONS DESCRIPTION: \_\_\_\_\_  
DATE: \_\_\_\_\_  
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2023 WASTEWATER FACILITY STUDY  
CITY OF BREEZY POINT  
CROW WING COUNTY, MINNESOTA  
**APPENDIX C**

**APPENDIX D  
ESTIMATED GROWTH  
FLOW, POPULATION, ERU'S**

Year	1.09%	Design 36.3 MG 1.94%	0.935%	Design 74.1 MG 2.077%	4.89%	1.89%	WWTP Estimate	
	$y = 0.2692x + 41.497$ Total Influent MG	$y = 0.3117x + 17.4$ Winter Influent	Summer Influent	$y = 0.7029x + 38.659$ Effluent Irrigation	Total Population	$y = 17.301x + 1060.1$ ERU's	1604 Available/(Needed) 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	
<b>Design Period</b>	<b>2023</b>	<b>47.69</b>	<b>24.57</b>	<b>23.12</b>	<b>54.83</b>	<b>2,941</b>	<b>1,458</b>	<b>146</b>
	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
<b>ERU 85%</b>	<b>2030</b>	<b>49.57</b>	<b>26.75</b>	<b>22.82</b>	<b>59.75</b>	<b>3,521</b>	<b>1,579</b>	<b>25</b>
	2031	49.84	27.06	22.78	60.45	3,604	1,596	8
<b>ERU Design Cap</b>	<b>2032</b>	<b>50.11</b>	<b>27.37</b>	<b>22.74</b>	<b>61.15</b>	<b>3,687</b>	<b>1,614</b>	<b>(10)</b>
	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)
<b>Irrigation Cap 85%</b>	<b>2035</b>	<b>50.92</b>	<b>28.31</b>	<b>22.61</b>	<b>63.26</b>	<b>3,935</b>	<b>1,666</b>	<b>(62)</b>
	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)



New Mixers with automatic control system

irrigation pumping structure

4.71 ac

8,225 sf

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

BY: \_\_\_\_\_  
DATE: \_\_\_\_\_  
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2023 WASTEWATER FACILITY STUDY  
CITY OF BREEZY POINT  
CROW WING COUNTY, MINNESOTA  
APPENDIX G - PROPOSED IMPROVEMENTS