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Margate WWTP Biosolids Projections

1. Introduction

The Broward County Water and Wastewater Services (BCWWS) program is currently consolidating the biosolids treatment capacity demand from all participating utilities to determine the total capacity of the centralized facility. The City has requested that Hazen and Sawyer (Hazen) assist in developing the next twenty-year outlook (2025-2045) for dewatered biosolids production to estimate the capacity it needs to secure at the centralized facility. The biosolids projections Hazen estimated at the City's request, including the assumptions and approach used, are briefly discussed in the technical memorandum (TM) herein.

2. Key Assumptions

The key assumptions made in completing the biosolids projections are listed below. Details of the approach and the assumptions are listed in Appendix A.

- Projected populations are based on 2024 Broward County and Municipal Population Forecasts and Allocation Model. Flows and loads are projected by multiplying the projected populations by the corresponding per capita flow/loads derived based on historical data from 2020 to 2024

- Biosolids projections are evaluated under two scenarios:

    - **Scenario 1**: With existing West and East Train infrastructure:
        - East Train biosolids production is estimated based on a yield of 0.8 lb TSS/lb BOD removed, based on historical data.
        - West Train sludge was estimated based on a yield of 1.1 lb TSS/lb BOD removed, based on historical data. The sludge estimated includes that from RBCs and chemical precipitation.
    - **Scenario 2:** With the new West Train membrane bioreactor (MBR) facility, replacing the RBCs

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  - Biosolids production estimated based on a yield of 0.87 lb TSS/lb BOD removed. The yield selected is based on the *"Overall Design Aspects"* document submitted to the City and Hazen's experience.
  - The East Train will be decommissioned once the new West MBR facility is built; therefore, all sludge generated under this scenario will come from the new MBR facility.
  - MBR facility is operational by the end of 2030.

- The solids capture rate from dewatering processes was assumed to be 95%, which is typical based on Hazen's experience.
- Following maximum volatile solids reductions (max VSR) from digestion were assumed. The characteristics of the digesters and belt filter presses are summarized in Appendix B:
  - Max VSR of 30% and 40% for West and East Trains under existing conditions (Scenario 1). A lower max VSR for the West Train was assumed to account for the chemical sludge
  - Max VSR of 40% for MBR sludge (Scenario 2)
- Wet sludge projections are based on achieving a solids content of **15.8%** through dewatering belt filter presses, as indicated by historical data.

The approach for projecting the dewatered wet and dry sludge production is presented in Figure 2-1.

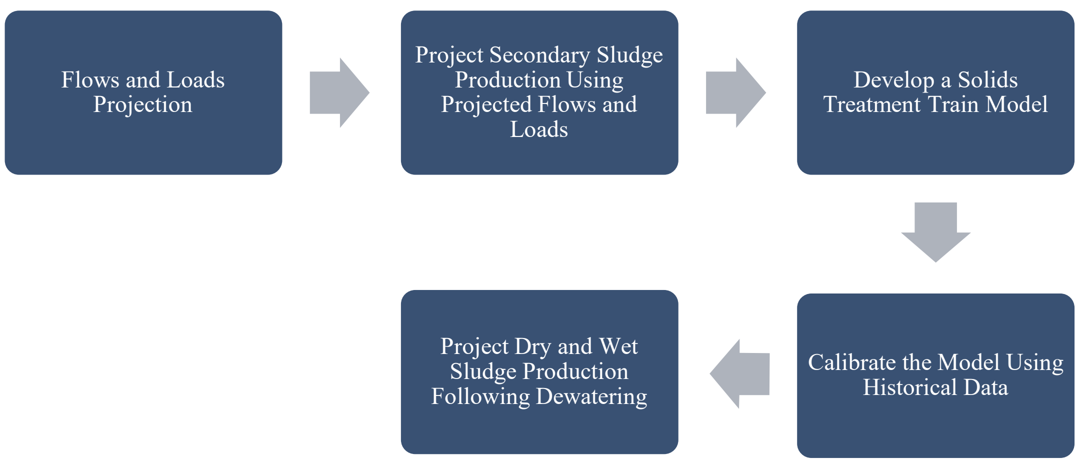

Figure 2-1: Dewatered Sludge Projection Approach

3. Flow and Load Peaking Factors

The flow and load peaking factors selected in the analysis are outlined in Table 3-1. Details of the historical flows and loads were discussed in the *"Capacity Assessment Update Report"* submitted to FDEP on September 8, 2025, and are summarized in Appendix B.

Table 3-1: Flow Peaking Factors

	Flow	Load
Minimum Day	0.60	0.52
Average Annual	1.00	1.00
Maximum TMADF	1.15	-
Maximum Month	1.40	1.38
Maximum Day	2.75	3.00

NOTE-

1. 2025 data is excluded from the peaking factor selection

4. Flows and Load Projections

The historical and projected populations in the service area, along with projected flows and loads, are outlined in Table 4-1.

Table 4-1: Population, Flows and Loads

Years	2020	2021	2022	2023	2024	2025	2030	2035	2040	2045	At Design Capacity[1]
	Historical					Projected					
Population	64,293	64,891	65,495	66,105	66,720	67,341	69,988	70,548	72,082	74,772	85,160[3]
East Train											
East Train Flow (mgd, AADF)	1.5	1.6	1.6	1.6	1.6	1.7[4]	1.8[4]	1.8[4]	1.8[4]	1.9[4]	2.1[4]
East Train BOD Load (lb/d)[5]	2100	2000	2000	2300	2000	2100[4]	2300[4]	2300[4]	2300[4]	2400[4]	2700[4]
East Train TSS Load (lb/d)	2100	2300	2300	2500	2400	2400[4]	2500[4]	2500[4]	2600[4]	2700[4]	3000[4]
West Train											
West Train Flow (mgd, AADF)	5.2	4.8	5.2	5.2	5.0	5.2[4]	5.5[4]	5.5[4]	5.6[4]	5.8[4]	6.7[4]
West Train BOD Load (lb/d)[5]	6500	6200	6200	6900	6400	6700[4]	6900[4]	6900[4]	7100[4]	7400[4]	8400[4]
West Train TSS Load (lb/d)	6700	7000	7300	7800	7300	7400[4]	7700[4]	7800[4]	7900[4]	8200[4]	9400[4]
Total											
Total Flow (mgd, AADF)	6.7	6.4	6.8	6.8	6.5	6.9	7.2	7.3	7.4	7.7	8.8
Total Flow (mgd, TMADF)[3]	7.7	7.4	7.8	7.8	7.5	7.9	8.3	8.4	8.5	8.9	10.1
Total BOD Load (lb/d)[5]	8700	8200	8200	9200	8500	8800	9200	9200	9400	9800	11100
Total TSS Load (lb/d)	**8800**	**9300**	**9600**	**10300**	**9700**	**9800**	**10200**	**10300**	**10500**	**10900**	**12400**

NOTES:

1. The equivalent AADF at 10.1 mgd TMADF (8.8 mgd AADF). The peaking factor is based on Table 3-1
2. Peaking factor is based on Table 3-1.
3. Estimated population at design capacity (10.1 mgd TMADF or 8.8 mgd AADF), assuming a unit WW generation of 103 gal/capita-day based on historical data
4. Based on East and West Trains flow splits of 24% and 76%, respectively, based on historical data. Load split is assumed to be the same as flow split
5. City reports cBOD. The values outlined in the table were derived using a cBOD/BOD ratio of 0.84

5. Biosolids Projections

The secondary sludge projection results for Scenarios 1 and 2, as described above, are outlined in Tables 5-2 and 5-1. As shown below, the secondary sludge production is expected to decrease by ~ 10% once the new MBR treatment takes effect.

Table 5-1: Scenario 2 Secondary Sludge Projections (With the new West Train MBR facility, replacing the RBCs)

	2025	2030	2035	2040	2045	At Design Flow[4]
East Train Sludge Production (Biological Sludge Only)						
WAS Load - Baseline Condition (lb/d)[1]	NA	7700	7700	7900	8200	9200
WAS Load - Upper Bound (lb/d)[2]	NA	8800	8800	9000	9400	10600
WAS Load - Lower Bound (lb/d)[3]	NA	6500	6500	6700	6900	7800

NOTES:
1. WAS projections based on a biomass yield of 0.87 lb TSS/lb BOD removed
2. At a yield 15% higher than the baseline yield
3. At a yield 15% lower than the baseline yield
4. The projected WAS load at 10.1 mgd TMADF, which is the design capacity of the new MBR system

Table 4-2: Scenario 1 Secondary Sludge Projections (With existing West and East Train infrastructure) – For Reference Only

	2025	2030	2035	2040	2045	At Design Flow[5]
East Train Sludge Production (Biological Sludge Only)						
WAS Load - Baseline Condition (lb/d)[1]	1600	1600	1600	1700	1800	2000
WAS Load - Upper Bound (lb/d)[2]	1800	1900	1900	1900	2000	2300
WAS Load - Lower Bound (lb/d)[3]	1300	1400	1400	1400	1500	1700
West Train Sludge Production (Biological and Chemical)						
WAS Load - Baseline Condition (lb/d)[4]	6800	7000	7000	7200	7500	8400
WAS Load - Upper Bound (lb/d)[2]	7800	8100	8100	8300	8600	9700
WAS Load - Lower Bound (lb/d)[3]	5700	6000	6000	6100	6400	7200
Total Sludge Production (Biological and Chemical)						
WAS Load - Baseline Condition (lb/d)	8400	8600	8600	8900	9300	10400
WAS Load - Upper Bound (lb/d)	9600	10000	10000	10200	10600	12000
WAS Load - Lower Bound (lb/d)	7000	7400	7400	7500	7900	8900

NOTES:
1. WAS projections based on a biomass yield of 0.8 lb TSS/lb BOD removed
2. At a yield 15% higher than the baseline yield
3. At a yield 15% lower than the baseline yield
4. WAS projections based on a combined biological and chemical yield of 1.1 lb TSS/lb BOD removed
5. The projected WAS load at 10.1 mgd TMADF, which is the design capacity of the existing facility

The projected daily dewatered biosolids productions for the next twenty years under Scenarios 2 and 1 are summarized in Tables 5-3 and 5-4. The estimates were developed for high, low, and baseline conditions to account for uncertainty and model sensitivity as discussed above. As shown in the tables below, a reduction of ~ 18% in hauled sludge tonnage could be anticipated following the new MBR construction. This reduction in dewatered sludge production is attributed to the elimination of chemical sludge following the completion of the MBR project and the improved aerobic digestion VSR reduction of West Train sludge, which currently contains chemical sludge. It is emphasized that the wet sludge projections shown below are based on achieving a solids content of 15.8% through dewatering belt filter presses, as indicated by historical data.

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Table 5-3: Scenario 2 Dewatered Biosolids Projections (With the new West Train MBR facility, replacing the RBCs)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	At Design Capacity[2]
	Baseline Projection for Dewatered Biosolids																					
Dry Sludge after dewatering (ton/d)	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.7	3.1
Wet Sludge after dewatering (ton/d)	15.1	15.3	15.4	15.5	15.6	15.7	15.8	15.8	15.8	15.8	15.9	15.9	16.0	16.1	16.2	16.2	16.4	16.5	16.6	16.7	16.9	19.3
Maximum Week Dewatered Wet sludge (tons/day)[1]	23.1	23.3	23.5	23.7	23.9	24.1	24.2	24.2	24.2	24.3	24.3	24.4	24.5	24.7	24.8	24.9	25.1	25.3	25.5	25.7	25.9	29.9
Annual dewatered dry sludge (tons/yr)	870	880	890	890	900	910	910	910	910	910	920	920	920	930	930	940	940	950	960	960	970	1,110
Annual Dewatered Wet Sludge (tons/yr)	**5,500**	**5,600**	**5,600**	**5,700**	**5,700**	**5,700**	**5,800**	**5,800**	**5,800**	**5,800**	**5,800**	**5,800**	**5,800**	**5,900**	**5,900**	**5,900**	**6,000**	**6,000**	**6,100**	**6,100**	**6,200**	**7,100**
	High-end Projection for Dewatered Biosolids[3]																					
Dry Sludge after dewatering (ton/d)	2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.5
Wet Sludge after dewatering (ton/d)	17.5	17.6	17.8	17.9	18.1	18.2	18.2	18.3	18.3	18.3	18.3	18.4	18.5	18.6	18.7	18.8	18.9	19.1	19.2	19.4	19.5	22.4
Maximum Week Dewatered Wet sludge (tons/day)[1]	26.9	27.1	27.4	27.6	27.8	28.0	28.1	28.1	28.2	28.2	28.3	28.4	28.6	28.7	28.8	29.0	29.2	29.4	29.7	29.9	30.1	34.8
Annual dewatered dry sludge (tons/yr)	1,010	1,020	1,020	1,030	1,040	1,050	1,050	1,050	1,050	1,060	1,060	1,060	1,070	1,070	1,080	1,080	1,090	1,100	1,110	1,120	1,120	1,290
Annual Dewatered Wet Sludge (tons/yr)	**6,400**	**6,400**	**6,500**	**6,500**	**6,600**	**6,600**	**6,700**	**6,700**	**6,700**	**6,700**	**6,700**	**6,700**	**6,800**	**6,800**	**6,800**	**6,800**	**6,900**	**7,000**	**7,000**	**7,100**	**7,100**	**8,200**
	Low-end Projection for Dewatered Biosolids[4]																					
Dry Sludge after dewatering (ton/d)	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.6
Wet Sludge after dewatering (ton/d)	12.8	12.9	13.0	13.1	13.2	13.3	13.3	13.4	13.4	13.4	13.4	13.5	13.6	13.6	13.7	13.7	13.8	13.9	14.0	14.2	14.3	16.3
Maximum Week Dewatered Wet sludge (tons/day)[1]	19.5	19.6	19.8	20.0	20.1	20.3	20.3	20.3	20.4	20.4	20.5	20.5	20.6	20.7	20.8	20.9	21.1	21.3	21.4	21.6	21.7	25.0
Annual dewatered dry sludge (tons/yr)	740	740	750	760	760	770	770	770	770	770	770	780	780	790	790	790	800	800	810	820	820	940
Annual Dewatered Wet Sludge (tons/yr)	**4,700**	**4,700**	**4,800**	**4,800**	**4,800**	**4,900**	**4,900**	**4,900**	**4,900**	**4,900**	**4,900**	**4,900**	**4,900**	**5,000**	**5,000**	**5,000**	**5,100**	**5,100**	**5,100**	**5,200**	**5,200**	**6,000**

NOTES:

1. Based on 15.8% solids content following dewatering
2. The projected wet sludge hauled at 10.1 mgd TMADF or 8.8 mgd AADF, which is the design capacity of the new MBR system
3. At a secondary solids production 15% higher than the baseline scenario
4. At a secondary solids production 15% lower than the baseline scenario

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Table 5-4: Scenario 1 Dewatered Biosolids Projections (With existing West and East Train infrastructure) – For Reference Only

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	At Design Capacity[2]
	Baseline Projection for Dewatered Biosolids																					
Dry Sludge after dewatering (ton/d)	2.9	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.2	3.2	3.2	3.2	3.3	3.8
Wet Sludge after dewatering (ton/d)	18.5	18.7	18.8	19.0	19.1	19.3	19.3	19.3	19.4	19.4	19.4	19.5	19.6	19.7	19.8	19.9	20.0	20.2	20.3	20.5	20.6	23.8
Maximum Week Dewatered Wet Sludge (tons/day)	28.3	28.5	28.8	29.0	29.2	29.5	29.5	29.6	29.6	29.7	29.7	29.9	30.0	30.1	30.3	30.4	30.6	30.9	31.1	31.4	31.6	35.6
Annual dewatered dry sludge (tons/yr)	1,070	1,080	1,090	1,090	1,100	1,110	1,110	1,120	1,120	1,120	1,120	1,130	1,130	1,140	1,140	1,150	1,150	1,160	1,170	1,180	1,190	1,370
Annual Dewatered Wet Sludge (tons/yr)	**6,800**	**6,800**	**6,900**	**6,900**	**7,000**	**7,000**	**7,000**	**7,100**	**7,100**	**7,100**	**7,100**	**7,100**	**7,200**	**7,200**	**7,200**	**7,200**	**7,300**	**7,400**	**7,400**	**7,500**	**7,500**	**8,700**
	High-end Projection for Dewatered Biosolids[3]																					
Dry Sludge after dewatering (ton/d)	3.4	3.4	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.7	3.7	3.7	3.7	3.8	4.4
Wet Sludge after dewatering (ton/d)	21.4	21.6	21.8	21.9	22.1	22.3	22.3	22.4	22.4	22.4	22.5	22.6	22.7	22.8	22.9	23.0	23.1	23.3	23.5	23.7	23.9	27.6
Maximum Week Dewatered Wet Sludge (tons/day)	32.8	33.1	33.4	33.7	33.9	34.2	34.3	34.3	34.4	34.4	34.5	34.7	34.8	35.0	35.1	35.3	35.6	35.9	36.1	36.4	36.7	42.6
Annual dewatered dry sludge (tons/yr)	1,230	1,240	1,250	1,260	1,270	1,290	1,290	1,290	1,290	1,290	1,300	1,300	1,310	1,310	1,320	1,320	1,330	1,350	1,360	1,370	1,380	1,590
Annual Dewatered Wet Sludge (tons/yr)	**7,800**	**7,900**	**7,900**	**8,000**	**8,100**	**8,100**	**8,100**	**8,200**	**8,200**	**8,200**	**8,200**	**8,200**	**8,300**	**8,300**	**8,300**	**8,400**	**8,400**	**8,500**	**8,600**	**8,600**	**8,700**	**10,100**
	Low-end Projection for Dewatered Biosolids[4]																					
Dry Sludge after dewatering (ton/d)	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.8	3.2
Wet Sludge after dewatering (ton/d)	15.7	15.8	15.9	16.1	16.2	16.3	16.3	16.4	16.4	16.4	16.4	16.5	16.6	16.7	16.7	16.8	16.9	17.1	17.2	17.3	17.5	20.1
Maximum Week Dewatered Wet Sludge (tons/day)	23.8	24.0	24.2	24.4	24.6	24.8	24.9	24.9	24.9	25.0	25.0	25.1	25.3	25.4	25.5	25.6	25.8	26.0	26.2	26.4	26.6	30.8
Annual dewatered dry sludge (tons/yr)	900	910	920	930	930	940	940	940	940	950	950	950	960	960	960	970	980	980	990	1,000	1,010	1,160
Annual Dewatered Wet Sludge (tons/yr)	**5,700**	**5,800**	**5,800**	**5,900**	**5,900**	**6,000**	**6,000**	**6,000**	**6,000**	**6,000**	**6,000**	**6,000**	**6,100**	**6,100**	**6,100**	**6,100**	**6,200**	**6,200**	**6,300**	**6,300**	**6,400**	**7,300**

NOTES:

1. Based on 15.8% solids content following dewatering
2. The projected wet sludge hauled at 10.1 mgd TMADF or 8.8 mgd AADF, which is the combined rated capacity of East and West Trains
3. At a secondary solids production 15% higher than the baseline scenario
4. At a secondary solids production 15% lower than the baseline scenario

Appendix A: Historical Flows and Loads

The approach employed for data screening and peaking factor selection is discussed below:

- **Data Analysis:** Historical influent data from 2020 to 2024 were compiled and reviewed, following the statistical analysis approach below. A pre-processing step was used to remove outliers, including BOD and TSS concentrations below 50 mg/L or above 800 mg/L:
  - Data points more than two standard deviations from the mean were excluded when calculating Annual Average values.
  - Data points more than three standard deviations from the mean were excluded when calculating minimum day, maximum month, week, and day values.
- **Terminology:** The terminology below is used herein:
  - **Carbonaceous Biochemical Oxygen demand (cBOD):** Lab-reported $cBOD_5$ using a nitrification inhibitor.
  - **Just "BOD":** Calculated as $cBOD_5/0.84$.
- **Flow Projection:** Projected flows were calculated based on the 2024 Broward County and Municipal Population Forecasts and Allocation Model using a per capita approach. The analysis conducted can be obtained from the "*Capacity Analysis Update Report"*.
- **Peaking Factor Selection:** Historical peaking factors were analyzed for the combined influent flows from both treatment trains. Flows and cBOD peaking factors selected from historical peaking factors. The selected peaking factors from the cBOD analysis were also applied to TSS.

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Appendix B: Solids Treatment Equipment Characteristics

Table B-1: East Train Aerobic Digesters Characteristics

Description	Units	Value
Digesters		
Number of Digesters	--	1
Type of Digester	--	Aerobic Digester
Width	ft	36.5
Length	ft	76
Water Depth	ft	14.25
Volume	gal	295,700
Surface Aerators		
Number of Aerators	--	3
Type of Aerator	--	Floating Aerator
Manufacturer	--	EPIC International, Inc.
Aerator Horsepower	HP	20

Table B-2: West Train Sludge Digestion/Thickening Characteristics

Description	Units	Digester/Thickener #1	Digester/Thickener #2
Digester/Thickener			
Number of Digesters	--	1	1
Type of Digester	--	Aerobic Digester/Thickener with Jet Aeration	Aerobic Digester/Thickener with Coarse Bubble Diffusers
Year of Installation	--	1988 / 2001	1988
Outer Diameter	ft	118	118
Digester Water Depth	ft	15	15
Thickener Diameter	ft	60	60
Thickener Water Depth	ft	10	10
Digester Volume (each)	gal	909,800	909,800
Digester Volume (total)	gal	1,819,500	
Thickener Volume (each)	gal	211,500	211,500
Thickener Volume (total)	gal	423,000	
Manufacturer	--	Chemineer	Sanitaire
Aeration System			

Table B-2: West Train Sludge Digestion/Thickening Characteristics

Description	Units	Digester/Thickener #1	Digester/Thickener #2
Type of Aeration	--	Jet Aeration Pumps	Coarse Bubble Diffusers
Number of Pumps	--	10	--
Number of Course Bubble Diffusers	--	--	1004
Manufacturer	--	Deming	Sanitaire
Pump Horsepower (each)	HP	15	--
Blowers[1]			
Number of Blowers	--	3	
Type of Blower	--	Multistage	
Manufacturer	--	Hoffman	
Blower Capacity (each)	scfm	4,100	
Discharge Pressure	psig	5.5	
Blower Horsepower (each)	HP	200	

Notes:
[1] These three blowers are primarily used for the aerobic digesters. However, these blowers are manifolded together with the two blowers that are used primarily for the RBCs.

Table B-3: West Train Sludge Dewatering Characteristics

Description	Units	Value
Belt Filter Press Feed Pumps		
Number of Pumps	--	2
Type of Pumps	--	Positive Displacement
Manufacturer	--	Moyno
Pump Horsepower (each)	HP	15
Feed Rate	gpm	0 - 100
Belt Filter Presses		
Number of Units	--	2
Belt Width	meters	2
Manufacturer	--	Ashbrooke
Exhaust Blower		
Number of Blowers	--	1
Manufacturer	--	Duall
Blower Horsepower	HP	10
Dewatering Drain Pumps		
Number of Pumps	--	3

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Table B-3: West Train Sludge Dewatering Characteristics

Description	Units	Value
Manufacturer	--	EMU
Pump Horsepower (each)	HP	20
Polymer Blend Units		
Number of Units	--	2
Manufacturer	--	Polyblend
Electric Hoist for Polymer System		
Number of Units	--	1
Manufacturer	--	Wright
Capacity	Tons	2

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Appendix C: Historical Flows and Loads

Table C-0-1: Historical Flows

	2020	2021	2022	2023	2024	2025[1]	Average	Maximum
	Flow (mgd)	Flow (mgd)	Flow (mgd)	Flow (mgd)	Flow (mgd)	Flow (mgd)	Flow (MGD)	Flow (MGD)
Minimum Day	2.0	3.7	3.1	4.6	4.4	3.8	3.6	4.6
Average Annual	6.7	7.0	6.8	6.8	6.5	4.4	6.8	7.0
Maximun TMADF	7.8	7.9	7.7	7.4	7.2	5.9	7.6	7.9
Maximum Month	8.1	13.6	8.9	8.5	8.4	4.7	9.5	13.6
Maximum Day	15.8	21.1	19.7	18.2	18.2	4.9	18.6	21.1

Table C-2: cBOD Loads

	2020	2021	2022	2023	2024	2025	Average
	Load (ppd)	Load (ppd)	Load (ppd)	Load (ppd)	Load (ppd)	Load (ppd)	Load (ppd)
Minimum Day	2,600	3,000	1900	4000	3600	3,922	3000
Average Annual	7,300	6,900	6900	7,700	7100	5,760	7200
Maximum Month	8,400	9,500	8400	8600	8400	6,349	8700
Max 30-Day	8,500	10,100	8600	8900	8400	6,404	8900
Max 7-Day	9,400	11,300	9700	11900	11900	7,316	10800
Maximum Day	13,600	20,700	13000	15800	14200	9,891	15500

Table C-3: TSS Loads

	2020	2021	2022	2023	2024	2025	Average
	Load (ppd)	Load (ppd)	Load (ppd)	Load (ppd)	Load (ppd)	Load (ppd)	Load (ppd)
Average Annual	8,800	9,300	9600	10,300	9700	6,786	9500
Maximum Month	10,600	11,900	15500	13500	13500	7,975	13000
Maximum Day	30,100	26,400	36200	33100	26100	13,025	30400

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Appendix D: Margate WWTP Flow Projection

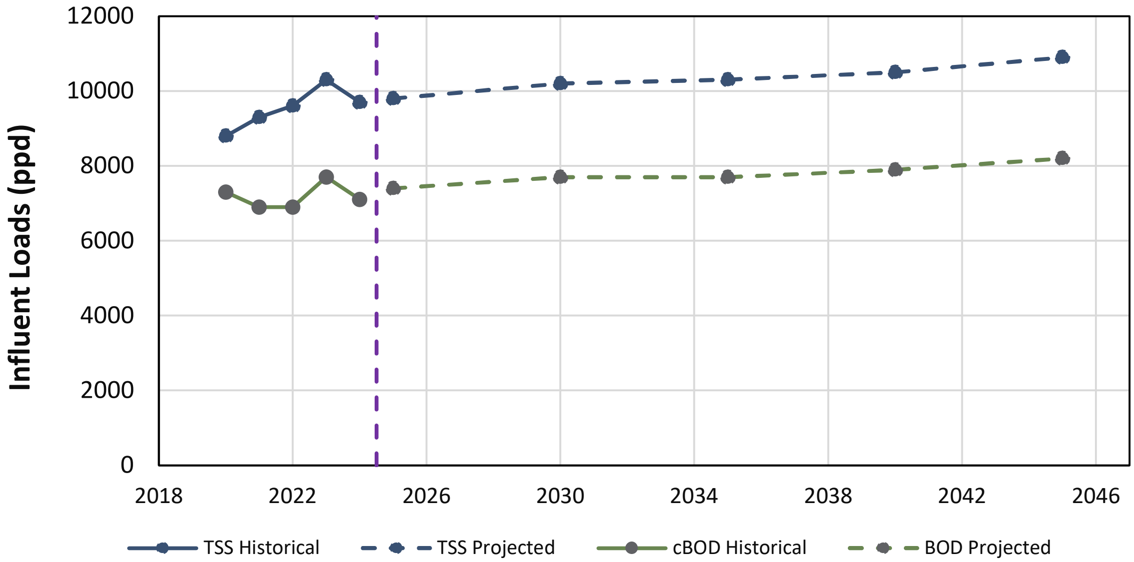

Figure 4-1: Projected Annual Average TSS and cBOD in Raw Influent