NOTICE AND CALL OF PUBLIC MEETING-WORK SESSION

Governmental Body: City Council

Date of Meeting: **July 14, 2023**

Time of Meeting: **5:30 p.m.**

Place of Meeting: City Hall
Council Chambers

PUBLIC NOTICE IS HEREBY GIVEN that the above mentioned governmental body will meet at the date, time and place above set out. The tentative agenda for said meeting is as follows:

1. Roll Call

2. Approval of Agenda

3. Pledge of Allegiance

4. Work Session on Wastewater Treatment Plant

WC WWTP FACILITY PLAN **ISU STUDENT-CHENEY** **SNYDER WC WWTP FACILITY** **DNR NPDES LIST**

and any other matters that may come before the Council.

5. Adjourn

This notice is given at the direction of the City Council pursuant to Chapter 21 Code of Iowa and the local rules of the City of Webster City, Iowa.

Signature: Karyl K. Bonjour
Title: City Clerk
CITY OF WEBSTER CITY

NOTE: The Council may act by motion, resolution or ordinance on items listed on the Agenda.

Facility Plan

Wastewater Treatment Facility Improvements

City of Webster City
August 31, 2022

Prepared by:
Bolton & Menk, Inc.
1519 Baltimore Drive
Ames, IA 50010
P: (515 233-6100
F: (515 233-4430

Real People. Real Solutions.

Certification

Facility Plan Report

For

Wastewater Treatment Facility Improvements

City of Webster City
Webster City, Iowa
A21.119239

August 31, 2022

I hereby certify that this engineering document 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 Iowa.

Andrew D. Sindt (Signature) 8/31/22 (Date)

Printed or typed name: Andrew D. Sindt, P.E.

My license renewal date is December 31, 2023

Pages or sheets covered by this seal:

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EXECUTIVE SUMMARY

The City of Webster City owns and operates a wastewater treatment facility that was originally built in 1939 with five significant upgrades over the past 83 years. The facility utilizes a fixed film technology where bacteria grow on rock and plastic media that is in contact with wastewater to break it down for discharging to the stream. The facility's aging infrastructure, obsolete equipment, and tight space constraints of the existing treatment plan site will require significant improvements to maintain compliance with Iowa DNR and US EPA regulations. New requirements in the recently renewed NPDES discharge permit include compliance with the Iowa Nutrient Reduction Strategy for removal of total nitrogen and phosphorus. In addition, the current facility is operating above rated capacity. Expected growth of the City and industrial users requires an increase in plant capacity. The City of Webster City completed this evaluation of alternatives for wastewater treatment facility improvements to meet the needs of the community over the next 20 years.

Modifications to the existing system were evaluated and found to be not economically feasible. The existing fixed-film process is not capable of significant total nitrogen and phosphorus removal as required by the Iowa Nutrient Reduction Strategy. Additionally, the existing treatment facility is at the end of its useful life and a major renovation is required. The existing plant site's limited size and close proximity to housing and the flood plain make expansion at the current plant location not feasible.

The recommended alternative is construction of a new extended aeration activated sludge plant with biological nitrogen and phosphorus removal at a site previously purchased by the City south of town. Extended aeration activated sludge is a robust treatment process with proven success achieving low ammonia and total nitrogen discharge concentrations. Biological phosphorus removal reduces dependence on chemical addition for phosphorus removal. Proposed improvements include construction of the following:

- Renovation of the east lift station
- Renovation of preliminary treatment, main lift station (raw lift station), and operations building at existing plant
- Construction of a forcemain from the existing plant to the proposed plant site
- Preliminary treatment facilities at grade
- Wet weather flow equalization basin
- Two aeration basin treatment trains
- Three clarifiers
- One RAS fermenter
- Two control structures
- Rapid mix tank
- UV disinfection
- Operations building
- Rotary drum thickener
- Sludge press building

- Sludge dewatering press
- Dewatered sludge storage
- Demolish unused structures at existing plant site including primary clarifiers, trickling filter, RBC's, anaerobic digesters, sludge storage tank, and chorine disinfection.

Treatment capacity allocation requests were provided by industrial users for design year 2025 and 2030. Industrial users cannot project their production rates and wastewater quantities beyond 5 to 10 years. A design period of 20 years was used for residential and commercial loadings for design year 2040. Treatment plant design capacity includes 25% reserve capacity for industrial growth as approved by City Council on October 4, 2021.

The capital cost opinion for these improvements is $78.4 million and the projected increase in operation maintenance and replacement (OM&R) costs is $381,000. Financing the proposed wastewater treatment facility will require very significant increases in sewer user rates. The City and consultant Public Financial Management are evaluating financing options with the Iowa State Revolving Fund (SRF) and USDA Rural Development to fund the project.

I. INTRODUCTION

A. Purpose

This report provides the City of Webster City, Iowa with recommendations for wastewater treatment facility (WWTF) improvements to address future effluent requirements, meet NPDES Permit requirements, increased operating capacity, and to implement a user friendly treatment process and operating system. Recommendations are based on input from the City staff, a visual inspection of the infrastructure, and an evaluation of facility requirements in accordance with the current recommended practices. City officials may use the information included in this report to make an informed decision on improvements to be implemented at the Webster City WWTF. This report is being completed in compliance with the City's NPDES Permit issued in October 2021 (Appendix A), including requirements for nutrient removal.

B. Background

The Webster City WWTF was originally constructed in 1939 as a primary treatment facility with primary clarifiers and anaerobic sludge digestion. A trickling filter was added in 1962. Several modifications were made in 1977 including grit removal, clarifiers, RBC's, chlorine disinfection, and another anaerobic digester. Other upgrades were completed in 1995, 1999, and 2017. The treatment facility receives raw wastewater from residents of Webster City and from three significant industrial users (SIU's): Mary Ann's Specialty Foods, Inc., Mertz Engineering, Inc., and Webster City Custom Meats, Inc. The City also has agreements to receive wastewater from a truck wash facility owned by Cactus Family Farms, LLC and an aquaculture operation, NaturalShrimp.

There are several issues with the current wastewater treatment facility equipment which will be developed further in the Existing Conditions section of the report. A brief list of these issues include outdated and obsolete control panels and motor control centers, no SCADA controls system, as well as increasing maintenance and repairs required for existing equipment, piping and structures, and digester and sludge storage tank issues. The treatment facility is operating above rated capacity. Additionally, the City's NPDES discharge permit includes a construction schedule for nutrient removal improvements by March 1, 202 .

C. Report Organization

To adequately address the major issues, the report is organized into 6 sections. Section II provides a review of the current and future design conditions; Section III describes the existing facilities; Section IV includes a review of the Iowa Nutrient Reduction Strategy and analyzes alternative treatment processes with cost opinions; Section V provides recommendations and an overview of implementation; and the report conclusions are provided in Section VI.

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II. DESIGN CONDITIONS

A. Planning Period

Wastewater treatment facilities are typically designed based on a 20-year planning period, as it is generally not feasible to ma e frequent changes in the capacity of a wastewater treatment facility. The design loads were initially developed in 2020 and revised in 2022. A design year of 2040 is used for this evaluation for residential and commercial loadings. The industrial users cannot project their production rates and wastewater discharge quantities beyond five to ten years. Reserve capacity of 25% of the total plant design loading is included as directed by City Council October 4, 2021. Projected wastewater flows and loadings are determined using a combination of population projections by City staff and expected commercial and industrial growth.

B. Population Projections

The design population was developed by City Manager Daniel Ortiz-Hernandez. The details of the City staff population projections are included as Appendix C.

The current (July 2015) population is 7,814. The design population is based on development of approximately 550 acres of land for residential purposes within the next 25 years. The City projects addition of approximately 1,650 housing units. Based on an average household size of 2.3, the projected increase in population over the next 20 years is 3,795. The total projected design year 2040 population is 11,609, a 49% increase from the current population.

C. Design Loads

The design loads are based on historical raw wastewater monitoring data, projected population, and requested treatment capacity allocations from the industrial users.

1. Residential and Commercial Design Loads

The residential and commercial design load is based on the calculated per capita loads from historical monitoring data for the period January 2012 thru December 2019. The historical residential and commercial CBOD, TSS, and TKN loads are estimated by subtracting the industrial loads from the total plant influent loads. Monthly average monitoring report data are used in these calculations. The data are attached as Appendix B.

The average day residential and commercial CBOD, TSS, and TKN design loads are based on the average calculated per capita loads attributed to residential and commercial users over the period January 2012 thru December 2019. See Appendi B for calculated historical residential and commercial loading data.

The ma imum day residential and commercial design loads are based on the 90th percentile historical calculated per capita loads. The residential and commercial design flowrate is based on the average calculated per capita flow attributed to residential and commercial users (92 gal/c/d) during December 2013, a period of very low precipitation and low inflow and infiltration flow.

Design organic loads are expressed in terms of CBOD. CBOD (rather than BOD) is the appropriate parameter for the design of biological wastewater treatment facilities. In addition, most of the historical monitoring data at this facility are CBOD. IDNR revised raw wastewater monitoring requirements from CBOD to BOD and is currently reviewing treatment process design on the basis of BOD rather than CBOD loading. DNR staff can assume for the purposes of process review and design organic loading that the BOD load is equivalent to the CBOD load for this facility.

The total plant influent less industrial contributor CBOD data are quite variable and appear to be not representative of typical per capita CBOD generation rates. The average calculated per capita CBOD contribution from residential and commercial users was 0.35 lbs CBOD/c/d, much greater than typical design loads observed at other cities and greater than IDNR design standard values. Similarly, the calculated per capita TSS and TKN values are greater than typical of other municipal treatment facilities. The reasons for these high per capita pollutant generation rates were not identified.

Tables 2.1 and 2.2 are summaries of the average and maximum day residential and commercial user design loads.

Table 2.1: Residential and Commercial User Average Day Design Loads

Parameter	Typical Per Capita Contribution	Design Per Capita Contribution	Design Value
Population			11,609
Flow	100 gal/c/d	92 gal/c/d	1.068 MGD
CBOD	0.17 lbs/c/d	0.35 lbs/c/d	4,063 lbs/d
TSS	0.22 lbs/c/d	0.46 lbs/c/d	5,340 lbs/d
TKN	0.032 lbs/c/d	0.042 lbs/c/d	488 lbs/d

Table 2.2: Residential and Commercial User Maximum Day Design Loads

Parameter	Design Per Capita Contribution	Design Value
Population		11,609
Flow	92 gal/c/d	1.068 MGD
CBOD	0.47 lbs/c/d	5,456 lbs/d
TSS	0.72 lbs/c/d	8,358 lbs/d
TKN	0.055 lbs/c/d	639 lbs/d

2. Industrial Contributor Design Loads

The three industrial users with significant flows and organic loads, Cactus Family Farms (truck wash), Mary Ann's Specialty Foods, and Webster City Custom Meats, submitted treatment plant capacity allocation requests in 2019 and 2020. Mary Ann's Specialty Foods submitted a revised capacity allocation request in October 2020 in anticipation of a production increase. The industrial treatment capacity allocation requests and Wastewater Services Agreements are included in Appendix E.

Mertz Engineering, Inc. is an EPA Metal Finishing Categorical User and has insignificant hydraulic and organic loading. The DNR Treatment agreement forms are included in Appendix E. The industrial users will execute new Treatment Agreements after the design flows and loads are finalized prior to the Construction Permit Application submittal.

Webster City Custom Meats and Mary Ann's Specialty Foods have Wastewater Treatment Agreements (DNR Form 542-3221). Cactus Family Farms and NaturalShrimp do not have DNR Treatment Agreement forms. The City and Cactus Family Farms entered into a February 29, 2020 Agreement that established discharge limits. A new industrial user, NaturalShrimp, an aquaculture operation entered into a February 19, 2021 Wastewater Services Agreement.

Table 2.3 is a summary of the current and proposed Treatment Agreement Limits.

Electrolux, a large home appliance manufacturer and significant industrial sewer user (0.50 MGD and 400 lbs BOD/d max. discharge limit), ceased operations in 2011. The Electrolux treatment capacity was reallocated to the other significant industrial users.

An aquaculture operation, VeroBlue Farms, started negotiations for wastewater treatment services in early 2016. The firm started operations in March 2017 and discharged wastewater to the City of Webster City. For several months the City and VeroBlue Farms were negotiating a long-term Agreement for Wastewater Treatment Services, including participation in the proposed treatment facility improvement project. VeroBlue had a very significant design wastewater flow and load that would result in a much larger City treatment facility design capacity. The VeroBlue design loads under this maximum load scenario were 0.240 MGD and 5,064 lbs CBOD/d. Negotiations terminated when VeroBlue Farms filed for bankruptcy on September 21, 2018, but then negotiations resumed in 2019 with potential new management after the bankruptcy.

VeroBlue Farms has now ceased operations. The long-term negotiations with VeroBlue Farms resulted in a three year delay in the City's wastewater treatment facility planning process.

A new aquaculture operation NaturalShrimp is currently operating a commercial shrimp production operation in the former VeroBlue facility.

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Table 2.3: Current and Proposed Treatment Agreement Limits								
Contributor	Flow, MGD				CBOD, lbs/d			
	Avg.		Max.		Avg.		Max.	
	Current	Proposed	Current	Proposed	Current	Proposed	Current	Proposed
Cactus Family Farms	0.008417	0.0125	0.015	0.021	120	256	160	435
Mary Ann's Specialty Foods	0.080	0.100	0.110	0.140	300	600	400	900
Webster City Custom Meats	0.080	0.070	0.110	0.110	600	500	900	1,000
NaturalShrimp	0.024	0.024	0.024	0.024	166	166	208	208
Total Industrial Load	0.192	0.207	0.259	0.295	1,186	1,522	1,668	2,543
	TSS, lbs/d				TKN, lbs/d			
	Avg.		Max.		Avg.		Max.	
	Current	Proposed	Current	Proposed	Current	Proposed	Current	Proposed
Cactus Family Farms	120	338	150	576	15	28	19	47
Mary Ann's Specialty Foods	150	200	250	300	30	60	40	80
Webster City Custom Meats	200	100	300	250	60	40	80	80
NaturalShrimp	100	100	150	150	18	18	20	20
Total Industrial Load	570	738	850	1,276	123	146	159	227

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3. Reverse Osmosis Water Treatment Reject Water

The City may replace its lime/soda ash potable water treatment process with a reverse osmosis (RO) treatment process in the near future. The reject stream from the RO process will be discharged to the sanitary sewer. This will increase the hydraulic loading on the wastewater treatment facility.

The design hydraulic loads from the future RO water treatment process are:

0.217 MGD average RO reject waste

0.400 MGD maximum day RO reject waste

4. Inflow and Infiltration

The City of Webster City has been implementing an inflow and infiltration (I/I) reduction program of collection system improvements. The City is also enforcing its foundation drain and sump pump ordinance. Even though the City has made collection system improvements for I/I reduction, the reported peak wet weather influent flowrates as illustrated in Appendix B Figure B.3 have not decreased during the past ten years.

The City continues to evaluate opportunities for peak flow reduction with collection system improvements for I/I reduction. The treatment facility design flows are based on the current estimated I/I flows.

The design monthly average wet weather I/I flowrate is calculated as the difference in the monthly average flowrates, excluding industrial flow, between the minimum average dry weather month and maximum wet weather month of record during the period January 2012 thru December 2019. The monitoring data are included in Appendix B.

Average Dry Weather Flow (December 2013):

0.771	MGD	Average City Plant Influent
-0.052	MGD	Average Industrial Discharge
0.719	MGD	Residential/Commercial Users

Average Wet Weather Flow (September 2018 – Peak Month):

3.439	MGD	Average City Plant Influent
-0.123	MGD	Average Industrial Discharge
3.316	MGD	Residential/Commercial Plus I/I

Average Wet Weather I/I:

3.316	MGD	Residential/Commercial Plus I/I AWW Flow (September 2018)
-0.719	MGD	Residential/Commercial ADW Flow (December 2013)
2.597	MGD	Average Wet Weather I/I Flow

The average wet weather I/I design flow excluding allowance for industrial reserve capacity is 2.597 MGD.

The design maximum wet weather I/I flow is calculated on the basis of the maximum day influent flow of record during the period January 2013 through December 2019. The maximum flow occurred on July 22, 2010. The maximum day wet weather I/I is calculated:

7.887	MGD	Max. Day City Plant Influent (October 9, 2018)
-0.089	MGD	Industrial Flow (October 9, 2018)
7.798	MGD	Residential/Commercial + I/I
-0.719	MGD	Residential/Commercial ADW Flow (December 2013)
7.079	MGD	MWW I/I Flow

The maximum day wet weather I/I design flow excluding industrial reserve capacity is 7.079 MGD.

5. Diurnal Flow Variations

The diurnal flow variation is estimated using the IDNR design standards peaking factors for typical municipal wastewater treatment facilities. A peak hour to maximum day residential sewage flow factor of 2.0 is used in the peak hour design flow derivation.

The peak hour residential/commercial and industrial design flowrate is calculated:

1.068	MGD	Max. Day Residential/Commercial Design Flow
0.295	MGD	Max. Day Industrial User Discharge Limits
+0.400	MGD	Max. Day RO Reject Design Flow
1.763	MGD	Max. Day Residential/Commercial plus Industrial Flow
x 2.0		Peaking Factor – peak hour : average day
3.526	MGD	Peak Hourly Residential/Commercial plus Industrial Flow

The peak hourly residential/commercial plus industrial design flow excluding industrial reserve capacity and including future RO reject wastewater is 3.526 MGD.

6. Peak Hour Wet Weather Design Flow

The peak hour wet weather (PHWW) design flow is based on the peak day I/I from historical data and adding the peak hour Residential/Commercial plus Industrial design flow including future RO reject wastewater.

The PHWW design flow is calculated:

3.526	MGD	Peak Hourly Residential/Commercial plus Industrial Design Flow plus RO reject water
1.175		25% Industrial Reserve
+7.079	MGD	MWW I/I Design Flow
11.780	MGD	PHWW Design Flow

The PHWW design flow is 11.780 MGD. This PHWW design flow is applicable to the raw wastewater lift station, forcemain, and treatment facility headworks design. Peak wet weather flow equalization will be provided. The activated sludge treatment facility will be designed on the basis of partial stormwater flow equalization.

7. Reserve Treatment Capacity

The City completed a formal Asset Management Plan for the wastewater treatment facility in 2008. The City Council and City staff included the requirement for a 25% treatment facility design reserve capacity to accommodate industrial growth as a Level of Service. The City Council subsequently confirmed this design requirement at a September 16, 2016 City Council Meeting.

The City Council revised the reserve capacity allocation from 25% as stated in the 2008 Asset Management Plan to 10% at an August 1, 2017 City Council Workshop due to potential issues with SRF financing of reserve capacity. DNR staff indicated that SRF financing may not be used for financing treatment capacity allocations for "speculative growth". Although there are no known formal rules regarding the allowable allowances for "speculative" growth in the SRF financing program, DNR staff subsequently indicated in 2021 that 25% allowance for industrial growth is reasonable and should be eligible for SRF financing. USDA Rural Development staff also indicated that 25% reserve capacity would be eligible for USDA financing.

The City Council reviewed the reserve capacity concept on October 4, 2021 and revised the design capacity to provide 25% of the total plant capacity as reserve capacity. The treatment facility design capacity includes 25% reserve capacity for industrial growth.

8. Design Flowrates

The design flowrates are based on the residential and commercial flowrates plus future water treatment plant RO reject, industrial design flowrates, industrial reserve capacity and I/I flowrates. Table 2.4 is a summary of the design flowrates.

Table 2.4: Design Flowrate Summary

Contributor	ADW MGD	AWW MGD	MWW MGD
Residential and Commercial	1.068	1.068	1.068
RO Reject	0.217	0.217	0.400
Industrial	0.207	0.207	0.295
Subtotal	1.492	1.492	1.763
25% Reserve Industrial Growth	0.497	0.497	0.588
Subtotal	1.989	1.989	2.351
I/I	0	2.597	7.079
Total Design Flow	1.989	4.586	9.430

Notes:
ADW refers to Average Dry Weather design flowrate
AWW refers to Average Wet Weather design flowrate
MWW refers to Maximum (day) Wet Weather design flowrate
PHWW refers to the Peak Hour Wet Weather design flowrate = 11.780 MGD

9. Flow Equalization

The City has a significant inflow and infiltration issue. The design MWW flowrate (9.430 MGD) is 4.7 times the ADW flowrate (1.989 MGD). The AWW design flowrate (4.586 MGD) is 2.3 times the ADW flowrate.

Use of a short term, peak wet weather flow equalization basin can significantly reduce the treatment facility cost. With the use of a peak wet weather flow equalization basin, the treatment facility can be designed on the basis of average wet weather (AWW) design flows rather than the maximum day wet weather (MWW) or peak hourly wet weather (PHWW) flowrate. This reduces the sizes of all plant components that are designed on the basis of hydraulic loading including clarifiers, disinfection equipment, pumps, and piping.

The daily influent flow data (ref. Appendix B, Figure B.1) indicate the very high peak flows are relatively short duration of less than six days.

The wet weather flow equalization basin evaluation details are included in Appendix F. The basin volume is based on evaluation of three wet weather periods over the eight year period 2012 thru 2019. The following wet weather periods were evaluated in detail:

April – June 2013

September – October 2018

March – June 2019

Reported daily plant influent flow data were used in the evaluation of a hypothetical flow equalization basin. The MWW design flowrate for the wastewater treatment facility design is increased from 4.586 MGD (AWW) to 4.986 MGD for reducing the required equalization basin volume. This 0.500 MGD (11%) increase in MWW plant design flow rate results in a significant reduction in the flow equalization basin volume.

The equalization basin volume is evaluated with the following approach as detailed in Appendix F:

1. Daily influent flows during the period January 2012 thru December 2019 are used in the evaluation.
2. Maximum plant influent flowrate for evaluation using the 2012 – 2019 data is set equal to the maximum month historical flow or historical maximum AWW flow (September 2018 = 3.439 MGD) plus 0.500 MGD additional flow for reduction in required equalization basin volume Total maximum day flow to the plant in the model is 3.939 MGD (Plant would have operated at the historical maximum AWW flow plus 0.50 MGD during peak flow).
3. Daily flow from the collection system in excess of the 3.939 MGD maximum day plant influent flow is routed to the flow equalization basin.
4. During periods when the influent flow from the collection system is less than the 3.939 MGD maximum plant influent flow, wastewater is drawn from the equalization basin to maintain 3.939 maximum day flow to the treatment plant until the equalization basin is empty.
5. The total volume in storage is calculated for each day by adding the volume added to storage (or subtracting volume drawn from storage) to the previous day storage volume.
6. The minimum required storage volume is the maximum volume in storage during the period of data analysis.

Graphs of influent flow, flows diverted to equalization basin, equalization basin storage volume, and flows from equalization basin to the treatment facility are illustrated graphically and in tabular format in Appendix F.

The evaluation indicates that the following minimum equalization basin volumes would be required to limit the hydraulic load in the treatment facility to the AWW flow plus 0.500 MGD excess wet weather flow for these extreme wet weather periods.

10.2 MG	April – June 2013
11.1 MG	September – October 2018
6.1 MG	March – June 2019

A 12 MG wet weather flow equalization basin is proposed. The MWW design flow with flow equalization for the new treatment facility is the AWW design flow (4.586 MGD) plus 0.500 MGD excess wet weather flow, or 5.086 MGD.

10. Phosphorus Design Load

The phosphorus design load is based on historical reported plant influent phosphorus loads for the period April 2016 thru December 2019. Historical phosphorus load data are included in Appendix B. As illustrated in Figures B.10 and B.11, the phosphorus load is highly variable. The design phosphorus load is based on 97 lbs/d historical average plus 49% for the design population increase. The average design phosphorus load is 145 lbs/d.

The maximum day phosphorus load is based on the historical ratio of 95th percentile maximum day load (226 lbs/d) to average day load (97 lbs/d), or 2.3 times the design average load. The maximum day design phosphorus load is 334 lbs/d.

11. Total Design Loads

The design loads as developed in the previous sections are summarized in Table 2.5. These design loads are also presented in IDNR Schedule G – Treatment Project Design Data and the Waste Allocation Load request in Appendix D. DNR letter of approval for these design loads is also included in Appendix D.

Table 2.5: Design Load Summary				
Parameters	AWW[1]		MWW[2]	
	Value	Percent	Value	Percent
Flow, MGD				
Residential/Commercial	1.068	23%	1.068	11%
RO Reject – Future	0.217	5%	0.400	4%
Industrial- Allocated	0.207	4%	0.295	3%
Industrial - Unallocated	0.497	11%	0.588	6%
Inflow and Infiltration	2.597	57%	7.079	76%
Total	4.586		9.430	
MWW Plant Design Flow, MGD[3]				
AWW Design Flow			4.586	
+ MWW Design Flow in excess of AWW			0.500	
Total Plant MWW Design Flow			5.086	
CBOD, lbs/d				
Residential/Commercial	4,063	55%	5,456	51%
Industrial- Allocated	1,522	20%	2,543	24%
Industrial - Unallocated	1,861	25%	2,666	25%
Total	7,446		10,665	
TSS, lbs/d				
Residential/Commercial	5,340	66%	8,358	65%
Industrial- Allocated	738	9%	1,276	10%
Industrial - Unallocated	2,026	25%	3,211	25%
Total	8,104		12,845	
TKN, lbs/d				
Residential/Commercial	488	58%	639	55%
Industrial- Allocated	146	17%	227	20%
Industrial - Unallocated	211	25%	289	25%
Total	845		1,155	
P, lbs/d				
Total	145		334	

ADW flow = 1.989 MGD

PHWW flow = 11.780 MGD

Notes:

1. AWW (Average Wet Weather) flows and loads are the maximum monthly average design flows and loads.
2. MWW (Maximum Wet Weather) flows and loads are maximum day design flows and loads.
3. MWW Plant Design Flow is based on partial equalization of MWW flow from the collection system in a stormwater equalization basin. The plant will be designed for a maximum day flow equal to the 4.586 MGD AWW design flow plus 0.500 MGD MWW flow in excess of the AWW design flow.

The design loads are quite conservative due to the following factors:

1. Per capita CBOD and TSS loads based on several years of plant influent monitoring data are significantly greater than national averages and DNR design standards.
2. It is assumed that maximum loads from residential/commercial users and all industrial users occur on the same day.

A wet weather flow equalization basin will be provided. The design flow rates are applicable to the hydraulic design of the flowing wastewater treatment facility components:

PHWW Flow (11.780 MGD)

- Raw sewage lift station
- Lift station forcemain to plant
- Headworks (screening and grit removal)

MWW Plant Design Flow (AWW Flow plus 0.500 MGD) (5.086 MGD)

- Biological secondary and tertiary treatment process design
- Disinfection
- Biological treatment facility process piping
- Outfall pipe to river

The discharge permit limits will be based on the MWW plant design flow (AWW design flow plus 0.500 MGD due to partial flow equalization with the stormwater flow equalization basin.

The current and future design loads are summarized in Table 2.6. The proposed AWW design flow is 41% greater than the current plant rated capacity. The proposed AWW design CBOD load is 79% greater than the current rated plant capacity.

The proposed treatment facility MWW design flow that is based on partial storm flow equalization (AWW design flow plus 0.500 MGD excess) is 18% less than the current rated plant capacity.

The historical reported actual loads and future design loads are summarized in Table 2.7. The proposed AWW design flow is 36% greater than the historical reported maximum monthly average actual flows. The proposed AWW design CBOD load is 58% greater than the historical reported maximum monthly average actual CBOD loads.

Table 2.6: Current and Future Design Load Summary						
Parameters	**AWW**			**MWW**		
	Current Design Load[1]	**Future Design Load**	**Percent Increase**	**Current Design Load[1]**	**Future Design Load**	**Percent Increase**
Population	11,000	11,609	6%			
Flow, MGD						
Residential/Commercial	0.930	1.068	15%	1.560	1.068	-32%
RO Reject – Future	--	0.217	--	--	0.400	--
Industrial	0.630	0.704	12%	0.740	0.883	19%
Inflow and Infiltration	1.700	2.597	53%	3.700	7.079	91%
Total	3.260	4.586	41%	6.000	9.430	57%
MWW Plant Design Flow[3]						
Total MWW Plant Design	--	--	--	6.000	5.086	-18%
CBOD, lbs/d						
Residential/Commercial	1,722	4,063	136%	1,722	5,456	217%
Industrial	2,428	3,383	39%	2,428	5,209	115%
Total	4,150	7,446	79%	4,150	10,665	157%
TKN, lbs/d						
Residential/Commercial	259	488	88%	259	639	147%
Industrial	141	357	153%	141	516	266%
Total	400	845	111%	400	1,155	188%

Notes:

1. Current Design Loads are based on the September 23, 1999 IDNR Schedule G – Treatment Project Design Data.
2. There are no TSS design loads stated in the September 23, 1999 IDNR Schedule G.
3. MWW Plant Design Flow refers to the maximum wet weather design flow to the treatment facility with partial stormwater flow equalization.

Table 2.7: Historical Actual and Future Design Load Summary						
Parameters	AWW			MWW		
	Historical Load	Future Design Load	Percent Increase	Historical Load	Future Design Load	Percent Increase
Population	7,814	11,609	49%			
Flow, MGD						
Residential/Commercial	0.711[2]	1.068	50%	0.711	1.068	50%
RO Reject - Future	--	0.217	--	--	0.400	--
Industrial	0.332	0.704	112%	0.493[7]	0.833	69%
Inflow and Infiltration	2.514	2.597	3%	7.079[5]	7.079	0%
Total[1]	3.382[3]	4.586	36%	5.344	9.430	76%
Maximum Day of Record				7.887	9.430	20%
CBOD, lbs/d						
Residential/Commercial[6]	2,735	4,063	49%	3,673	5,456	48%
Industrial	1,062	3,383	218%	1,931	5,209	170%
Total[1]	4,721[3]	7,446	58%	6,509	10,665	64%
TSS, lbs/d						
Residential/Commercial[6]	3,594	5,340	49%	5,626	8,358	49%
Industrial	559[4]	2,764	395%	1,039	4,487	331%
Total[1]	8,788[3]	8,104	-8%	9,661	12,845	33%
TKN, lbs/d						
Residential/Commercial[6]	328	488	49%	430	639	49%
Industrial	203	357	-20%	383	516	35%
Total[1]	574[3]	845	47%	845	1,155	37%

Notes:

1. Historical total AWW Flows and loads, except as noted, are based on 99th percentile reported monthly average influent monitoring data for the period 2017-2019.
2. Historical Residential/Commercial AWW Flow is based on Residential/Commercial ADW Flow (December 2013).
3. Total Historical AWW Flows and Loads are not equal to the sum of Flows and Loads for Residential/Commercial plus Industrial Flows and Loads because the peak loads from user classes may not occur during the same time period.
4. Historical AWW Industrial User TSS Load is based on 95th percentile data for 2017-2019 due to outlier data in 99th percentile calculation.
5. Historical Inflow and Infiltration for MWW is based on calculations in Section 2.3.4.
6. Historical Residential and Commercial Loads are based on the 2013-2019 estimated per capita loads and 7,814 population:

AWW per capita loads (50th Percentile of Monthly Average)

0.35 lbs CBOD/c/d

0.46 lbs TSS/c/d

0.042 lbs TKN/c/d

MWW per capita loads (90th Percentile of Monthly Average)

0.47 lbs CBOD/c/d

0.72 lbs TSS/c/d

0.055 lbs TKN/c/d

7. Historical Industrial User MWW Flow is based on 95th percentile of 2017-2019 daily maximum values from monthly reporting data due to impact of VeroBlue flow on daily data and 99th percentile data.

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III. EXISTING WASTEWATER FA ILITIES

A. Facility History

The wastewater treatment facility was constructed under several major projects from 1939 through 1999. Most of the process equipment and mechanical equipment was replaced during the 1995 and 1999 plant improvement projects.

The plant is a biological treatment facility with primary clarification for raw solids removal and anaerobic digestion with the following major components:

- aerated grit removal
- raw lift pumps (4)
- primary clarifiers (3)
- trickling filter
- intermediate lift pumps (3)
- rotating biological contactors (RBCs) (20)
- final clarifiers (2)
- chlorine disinfection
- sodium metabisulfite dechlorination
- anaerobic biosolids digesters (2)
- biosolids storage tank
- liquid biosolids land application

The plant was constructed and improved in several stages. The following is a summary of the existing facility construction dates:

- 1939 Original Plant Construction
  - operations building
  - Primary Clarifier No. 1 (north) tank
  - primary anaerobic biosolids digester tank
  - intermediate lift wet well
- 1962 Trickling Filter Expansion
  - trickling filter tank and media
  - Primary Clarifier No. 2 (south) tank
- 1977 Tertiary Treatment, Disinfection, and Sludge Treatment Expansion
  - aerated grit removal tanks
  - raw wet well
  - Primary Clarifier No. 3 (west tank
  - RBC biological treatment tanks
  - final clarifier tanks

- chlorine contact basin and building
- outfall pipe to river
- secondary anaerobic biosolids digester
- electrical control panels

* 1995 Phase I Plant Improvements
    - intermediate lift pumps
    - trickling filter recirculation piping
    - RBC covers (demolish RBC building)
    - RBC equipment (12 of 20 units)
* 1999 Phase II Plant Improvements
    - raw lift pumps
    - maintenance garage
    - biosolids storage tank
    - RBC equipment (8 of 20 units)
    - RBC and final clarifier diversion structure (peak flow split)
    - primary sludge pumps and piping
    - primary clarifier equipment
    - trickling filter distributor
    - final clarifier equipment
    - primary anaerobic digester cover
    - secondary anaerobic digester cover
    - HVAC equipment – all buildings
    - biosolids storage tank
    - biosolids treatment equipment and pumps
    - biosolids treatment piping
    - biosolids treatment control system
    - biosolids treatment boilers
    - biogas piping and waste gas burner
    - process area lighting fixtures and wiring
    - chemical feed equipment
    - roofing system – all buildings
    - masonry tuck pointing (partial) all buildings
* 2016-17 Renovation Project
    - replace primary digester cover
    - replace primary digester mixing system

- renovate Primary Clarifier No. 1 tank

Table 3.1 is a summary of the construction dates and ages of the significant assets.

Table 3.1 – Wastewater Treatment Facility – Summary of Significant Asset Ages		
Component	**Construction Date**	**Age Years**
Operations Building	1939	83
Primary Clarifier No. 1 Tank	1939	83
Primary Digester Tank	1939	83
Intermediate Wet Well	1939	83
Trickling Filter Tank and Media	1962	60
Primary Clarifier No. 2 Tank	1962	60
Raw Wet Well and Grit Removal	1977	45
Primary Clarifier No. 3 Tank	1977	45
RBC Tanks	1977	45
Final Clarifier Tanks	1977	45
Chlorine Contact Tank	1977	45
Secondary Digester Tank	1977	45
Electrical Equipment	1977	45
Intermediate Lift Pumps and Piping	1995	27
RBC Covers	1995	27
RBC Equipment (12 of 20 Units)	1995	27
Raw Lift Pumps and Piping	1999	23
Biosolids Storage Tank	1999	23
RBC Equipment (8 of 20 Units)	1999	23
Primary Clarifier Equipment	1999	23
Primary Sludge Pumps and Piping	1999	23
Trickling Filter Distributor	1999	23
Final Clarifier Equipment	1999	23
Digester Covers and Equipment	1999	23
Chemical Feed Equipment	1999	23
Roofing Systems	1999	23
HVAC Equipment	1999	23
Process Area Electrical and Lighting	1999	23
Primary Digester Cover Replacement	2017	5
Primary Digester Mixing System	2017	5
Primary Clarifier No. 1 Tank Renovation	2017	5

Figure 3.1 is a diagram of the existing plant processes. The plant is designed for carbon (BOD), suspended solids, and ammonia removal but does not include provisions for total nitrogen and total phosphorus removal.

Figure 3.2 is an aerial photograph of the existing treatment facility.

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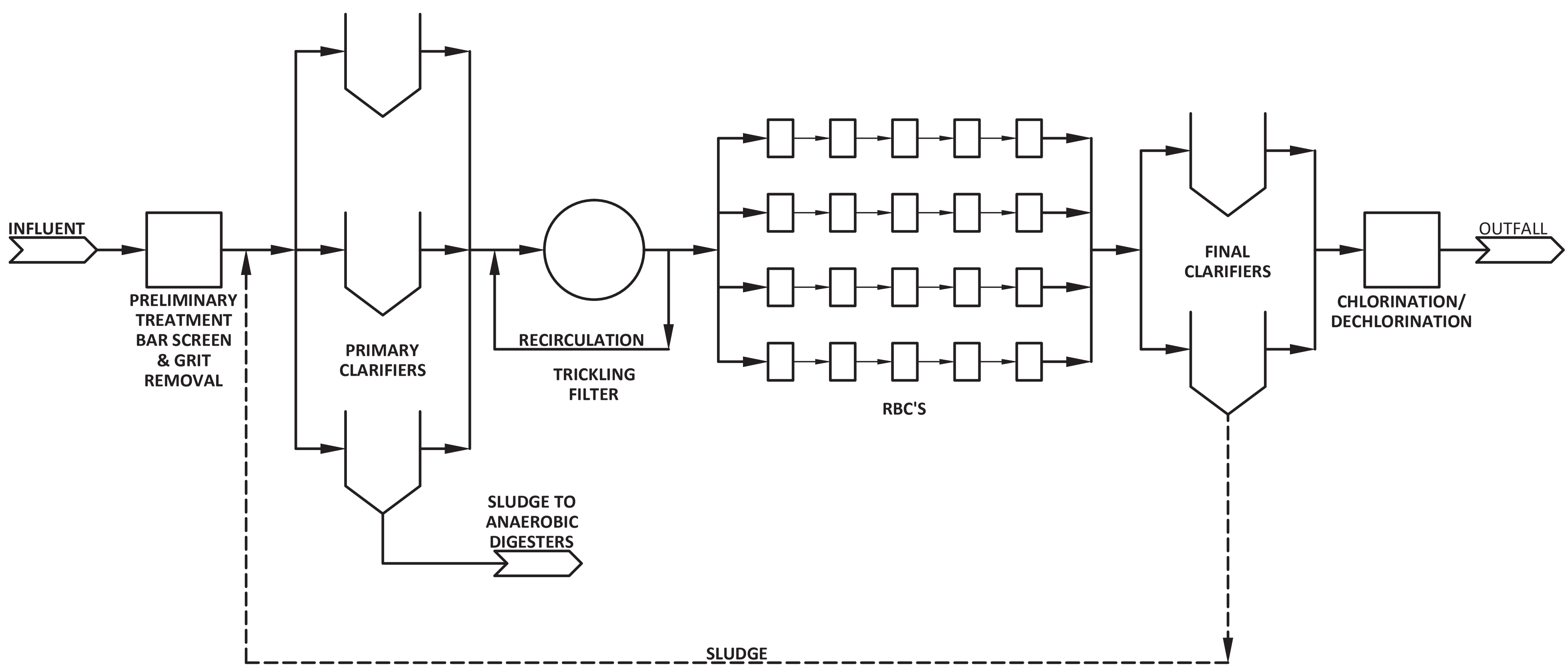

Figure 3.1 - Existing WWTF Process
Webster City WWTF Improvements
Facility Plan - August 2022

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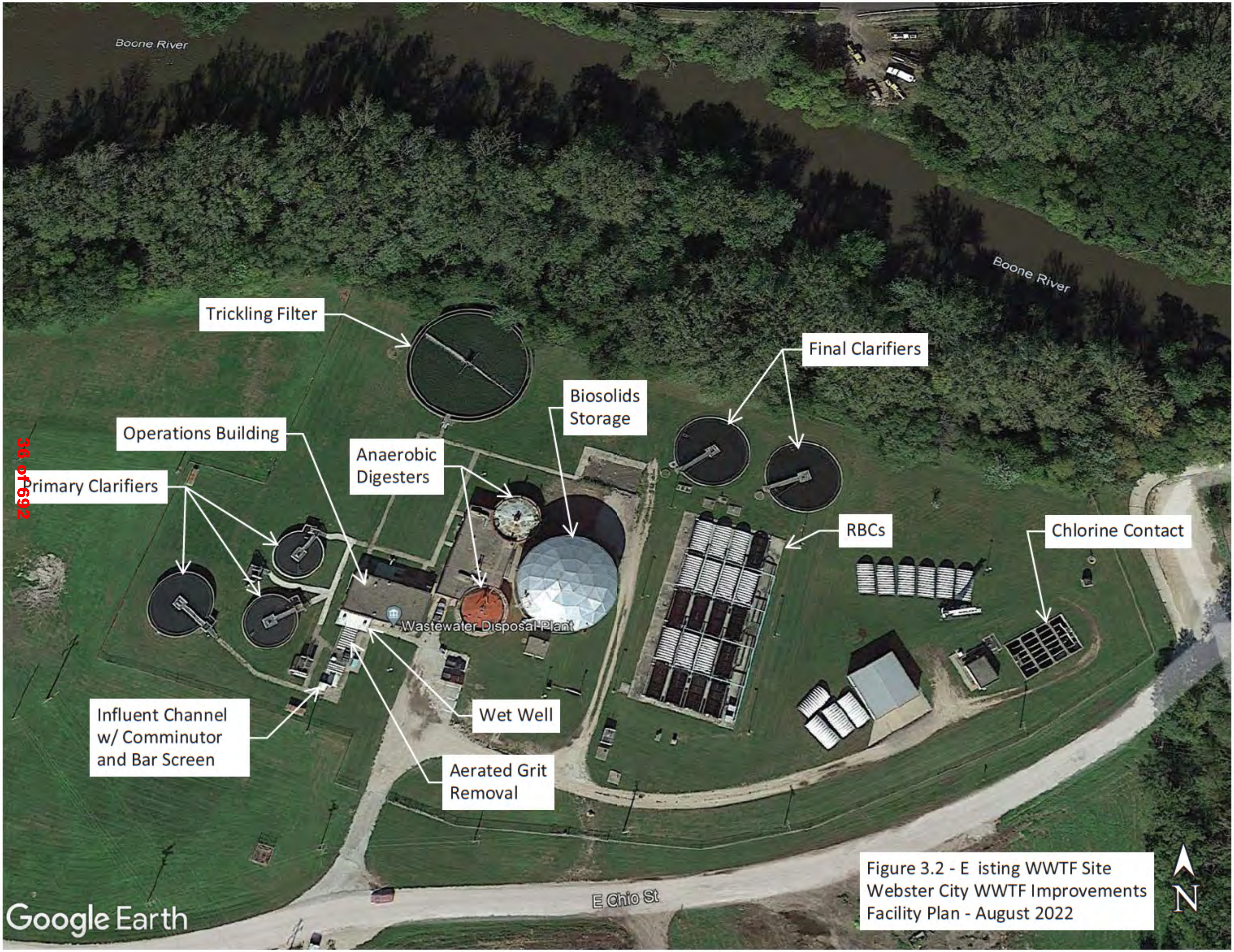

Figure 3.2 - E isting WWTF Site
Webster City WWTF Improvements
Facility Plan - August 2022

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The rated plant capacity and historical actual loading summary is presented in Table 3.2. Historical loadings exceeded plant rated capacity indicating the existing facility is operating above its rated design capacity and an increase in treatment plant capacity is required. Influent and effluent monitoring data are included as Appendix B.

Table 3.2 – Rated Plant Capacity and Historical Actual Loadin Summary		
Parameter	Current Rated Capacity[1]	Hi torical Lo d[2]
Flow		
Average Dry Weather	1.5 MGD	
Average Wet Weather	3.3 MGD	3.82 MGD
Maximum Wet Weather	6.0 MGD	9.43 MGD
Pea Hourly	6.7 MGD	
Carbonaceous Biochemical Oxygen Demand (CBOD)		
Average	4,150 lbs/d	4,721 lbs/d
Maximum	4,150 lbs/d	6,509 lbs/d
Total Kjeldahl Nitorgen (TKN)		
Average	364 lbs/d	5 4 lbs/d
Maximum	400 lbs/d	845 lbs/d

Note:
1. Rated Capacity as per April 20, 1999 IDNR Construction Permit application – Schedule G
2. Refer to Table 2.7 for additional information

B. NPDES Discharge Permit

The current NPDES discharge permit was issued October 2021. A copy of the permit is provided in Appendi A. The plant has two outfall locations; Outfall 001 Oxbow La e and Outfall 003 Boone River. The plant discharges to the oxbow lake for improved water quality in the oxbow lake. The oxbow lake is used for recreation and the 7B Ranch community event facility. The plant typically discharges to Outfall 001 Oxbow La e. Discharge limits are summarized in Table 3.3. The following revisions were made in the permit issue October 2021:

- Iowa Nutrient Reduction Strategy construction schedule added.
- More stringent ammonia limits
- Total zinc limits were removed
- Total silver limits were removed

Table 3.3 – Webster City WWTF NPDES Discharge Limits[1]		
Parameter	Outfall 001 Oxbow	Outfall 003 River
Carbonaceous Biochemical Oxygen Demand (CBOD)		
7-day avg. conc.	40 mg/L	40 mg/L
30-day avg. conc.	25 mg/L	25 mg/L
7-day avg. mass	1,101 lbs/d	1,101 lbs/d
30-day avg. mass	688 lbs/d	688 lbs/d
Total Suspended Solids		
7-day avg. conc.	45 mg/L	45 mg/L
30-day avg. conc.	30 mg/L	30 mg/L
7-day avg. mass	1,238 lbs/d	1,238 lbs/d
30-day avg. mass	826 lbs/d	826 lbs/d
Nitrate Nitrogen		
30-day avg. mass	760 lbs/d	760 lbs/d
Daily max. mass	1,244 lbs/d	1,244 lbs/d
Ammonia Nitrogen (Seasonal Limits)		
30-day avg. conc.	1.0 – 4.0 mg/L	2.0 – 9.4 mg/L
Daily max. conc.	14.2 – 17.6 mg/L	12.2 – 16.6 mg/L
30-day avg. mass	26 – 109 lbs/d	53 – 246 lbs/d
Daily max. mass	391 – 484 lbs/d	179 – 448 lbs/d
Total Cadmium		
30-day avg. conc.	0.0004523 mg/L	0.0006277 mg/L
Daily max. conc.	0.004316 mg/L	0.004474 mg/L
30-day avg. mass	0.01245 lbs/d	0.01464 lbs/d
Daily max. mass	0.1188 lbs/d	0.1208 lbs/d
Total Residual Chlorine		
30-day avg. conc.	0.008 mg/L	0.012 mg/L
Daily max. conc.	0.019 mg/L	0.020 mg/L
30-day avg. mass	0.216 lbs/d	0.274 lbs/d
Daily max. mass	0.523 lbs/d	0.536 lbs/d
Total Copper		
30-day avg. conc.	0.01687 mg/L	0.02177 mg/L
Daily Max. conc.	0.02690 mg/L	0.02773 mg/L
30-day avg. mass	0.4642 lbs/d	0.5256 lbs/d
Daily max. mass	0.7403 lbs/d	0.7507 lbs/d
Ceriodaphnia & Pimephales Acute Toxicity		
Daily max.	No Toxicity	No Toxicity
Dissolved Oxygen		
Daily min.	5.0 mg/L	4.3 mg/L
pH		
Daily max.	9.0 SU	9.0 SU
Daily min.	6.5 SU	6.5 SU
Fecal Coliform (Seasonal)		
Geometric Mean	630 MPN/100 mL	126 MPN/100 mL

Note:

1. Discharge limits are as per NPDES permit number 4063001, issued October 1, 2021

The Webster City WWTF incurred the following exceedances of NPDES permit limits over the review period of March 2016 through December 2020.

- August, September, October 2016 – TSS maximum concentration.
- November 2016 – TSS average and maximum concentration, Copper concentration and mass
- March 2017 – pH maximum limit.
- May 2017 – Copper concentration and mass.
- October, August 2017 – E. Coli geometric mean.
- October 2018 – E. Coli geometric mean, Total Residual Chlorine
- November 2018 – Total Residual Chlorine
- February 2021 – Ammonia Nitrogen Average and Maximum Concentration

IDNR wastewater facility inspection reports from August 2017, July 2019, and March 2021 are provided in Appendix H for reference.

C. Industrial Users Discharge Monitoring

Webster City Custom Meats and Mary Ann's Specialty Foods had periodic violations of treatment agreement limits over the review period. Both industries have requested increases in their discharge limits. The following is a brief summary of Treatment Agreement violations over the review period March 2016 through December 2020:

- Webster City Custom Meats
  - Several violations of treatment agreement limits over the review period including: Flow, BOD, TSS, TKN, O&G, and pH.
  - February 2020 – Webster City Custom Meats – Notice of Violation issued for treatment agreement limit violations.
  - August 2022 – Notice of Violation issued for treatment agreement limit violations during the months of January, February, March and June 2022.
- Mary Ann's Specialty Foods
  - Several violations of treatment agreement limits over the review period including: Flow, BOD, TSS, TKN, O&G, and pH.
  - November 2020 – Letter of Noncompliance issued for treatment agreement limit violations.
  - August 2022 – Notice of Violation issued for treatment agreement limit violations during the months of January, February, March, April, May and June 2022.

D. Proposed Discharge Limits

DNR completed waste load allocations (WLA) for DNR approved (Schedule G 5-23-22) design flows and loads in July and August 2022. Three discharge locations were considered:

- Proposed Outfall 001 Boone River downstream of Ditch 166.
- Proposed Outfall 002 Oxbow Lake (location of existing Outfall 001).
- Proposed Outfall 003 Boone River upstream of Ditch 166.

Table 3.4 is a summary of WLA preliminary discharge limits. Outfall 001 Boone River downstream of Ditch 166 generally has the least stringent limits because this location has the highest background flow for mixing and dilution of the treatment plant effluent. This report assumes Outfall 001 will be the primary discharge point. Refer to Figure 5.1 for outfall locations.

Table 3.4 – Webster City WLA Discharge Limits[1]

Parameter	Outfall 001 River Downstream	Outfall 002 Oxbow	Outfall 003 River Upstream
Nitrate Nitrogen			
30-day avg. mass	760 lbs/d	760 lbs/d	760 lbs/d
Daily max. mass	1,244 lbs/d	1,244 lbs/d	1,244 lbs/d
Ammonia Nitrogen (Seasonal Limits)			
30-day avg. conc.	3.1 - 12.7 mg/L	1.0 - 4.0 mg/L	1.4 - 5.8 mg/L
Daily max. conc.	15.0 - 18.3 mg/L	14.2 - 17.6 mg/L	14.4 - 17.8 mg/L
30-day avg. mass	71.8 - 296.9 lbs/d	36.5 - 151.1 lbs/d	44.1 - 182.4 lbs/d
Daily max. mass	556.3 - 686.0 lbs/d	543.0 - 672.5 lbs/d	546.2 - 676.6 lbs/d
Total Cadmium			
30-day avg. conc.	0.003237 mg/L	0.002171 mg/L	0.002427 mg/L
Daily max. conc.	0.01059 mg/L	0.01014 mg/L	0.01023 mg/L
30-day avg. mass	0.1015 lbs/d	0.08303 lbs/d	0.08802 lbs/d
Daily max. mass	0.3952 lbs/d	0.3877 lbs/d	0.3893 lbs/d
Total Copper			
30-day avg. conc.	0.04111 mg/L	0.02754 mg/L	0.03082 mg/L
Daily Max. conc.	0.04773 mg/L	0.04570 mg/L	0.04613 mg/L
30-day avg. mass	1.289 lbs/d	1.053 lbs/d	1.118 lbs/d
Daily max. mass	1.782 lbs/d	1.748 lbs/d	1.755 lbs/d
Ceriodaphnia & Pimephales Acute Toxicity			
Daily max.	No Toxicity	No Toxicity	No Toxicity
Dissolved Oxygen			
Daily min.	4.2 mg/L	5.0 mg/L	4.3 mg/L
pH			
Daily max.	14.0 SU	14.0 SU	14.0 SU
Daily min.	6.5 SU	6.5 SU	6.5 SU
Fecal Coliform (Seasonal)			
Geometric Mean	127 MPN/100 mL	126 MPN/100 mL	126 MPN/100 mL
Chloride			
30-day avg. conc.	629 mg/L	437 mg/L	480 mg/L
Daily Max. conc.	735 mg/L	706 mg/L	712 mg/L
30-day avg. mass	19,940 lbs/d	12,728 lbs/d	17,471 lbs/d
Daily max. mass	27,489 lbs/d	27,004 lbs/d	27,107 lbs/d
Sulfate			
30-day avg. conc.	2,142 mg/L	2,000 mg/L	2,073 mg/L
Daily Max. conc.	2,142 mg/L	2,054 mg/L	2,073 mg/L
30-day avg. mass	80,028 lbs/d	76,494 lbs/d	78,882 lbs/d
Daily max. mass	80,028 lbs/d	78,572 lbs/d	78,882 lbs/d

Note:
1. Discharge limits are as per DNR Wasteload Allocation Calculations and Notes, July 29 and August 11.

E. Process Description

Wastewater generated throughout the City of Webster City is conveyed to the treatment facility through a 36-inch gravity interceptor sewer line. Raw influent wastewater is received at the treatment facility approximately 20 feet below grade, where preliminary treatment is accomplished. Preliminary treatment includes comminutor, coarse bar screen and aerated grit removal. After preliminary treatment, raw lift pumps transfer the water up to the primary clarifiers for removal of settleable solids, ahead of the trickling filter. A portion of the influent CBOD and TKN load is removed with the primary solids. Primary sludge is pumped to the anaerobic digesters.

Wastewater flows from the primary clarifiers to the intermediate lift station where the water is pumped to the top of the trickling filter. A portion of the trickling filter effluent is directed back to the intermediate lift station for recirculation.

Wastewater flows from the trickling filter to the RBC's. CBOD is further removed and TKN is converted to nitrate through the RBC's. The flow continues to the final clarifiers for suspended solids removal and then to the chlorine contact basin for disinfection. After disinfection plant effluent is discharged to an unnamed creek to the Oxbow Lake (primary) or to the Boone River (alternate).

Sludge is pumped from the primary and final clarifiers to the anaerobic digesters. Anaerobic digested sludge is transferred to the biosolids storage tank where is held until land application.

F. Evaluation of Facilities

In general, the Webster City WWTF buildings appear to be in good condition, a testament to the maintenance and upkeep of the facility over its life. However, most of the mechanical components of the facility are at the ends of their useful lives and require replacement. Details regarding the system components are discussed below.

1. East Lift Station

East Lift Station pumps are located in a steel dry well next to the precast concrete wet well. The steel dry well is failing and needs to be replaced or demolished and submersible pumps installed in the wet well. The City has noted grease buildup in this wet well. Recommend grease cleaning design features be evaluated with new improvements. Recommend standby power be installed and consider locating pump power and control panels in a small building enclosure for weather protection.

East Lift Station

2. Preliminary Treatment

Preliminary treatment is accomplished in a covered pit, approximately 20 feet below grade at the influent gravity sewer elevation. Preliminary treatment components include bar screen, comminutors, aerated grit removal. Access to the preliminary treatment area is by a stair. Screenings must be manually transported up the stairs for disposal. The equipment has reached the end of it's useful life and needs to be replaced, however it appears the concrete structure is in good shape and could be used as the lift station to the new site south of town.

Aerated Grit Chamber, Wet Well and Operations Building

Proposed improvements require wastewater to be pumped about 1.5 miles from the existing plant site to the new site south of town. It is important that screenings and grit be removed from the wastewater prior to pumping to reduce maintenance requirements for the 1.5 mile forcemain. Recommend installation of a mechanically cleaned screen with discharge of screenings to a new dumpster storage building located at grade. Recommend aerated grit removal chamber be renovated and cover over wet well be replaced.

Influent Channel and Comminutor

G. Main Lift Station (Raw Lift Station)

Main lift pumps are located in the Operations Building dry well constructed in 1939. The building and below grade structure appear to be in good shape. Recommend detailed review of building and structure during design phase to determine suitability for 30 year (minimum) use. Consider ta ing core samples inside the wet well to gauge concrete integrity. Recommend a new lab and office space be provided at the new treatment plant site south of town to provide facilities close to the new treatment process. Recommend replacing existing lift pumps, piping and valves with new equipment sized for proposed design flows and total dynamic head required to pump water to new site. The facility currently operates with power feed from two sources to satisfy requirements for power redundancy. The City indicated they would prefer to install a standby generator for future operations so that the facility will have power if something disrupts power to both transmission lines. Recommend installing standby generator for main lift station. Recommend replacing ventilation equipment and installing dehumidifiers in dry well to reduce corrosion.

M in Lift Pumps at Operation Building

H. Primary Clarifiers

The primary clarifiers were constructed in 1939, 1962, and 1977. The primary clarifiers were rebuilt in 2017 and are in good condition. The future treatment process will likely not include primary clarification as the carbon removed in primary clarification will be needed in the secondary treatment process for total nitrogen and total phosphorus removal.

Primary Cl ri ier

I. Trickling Filter

The trickling filter was originally constructed in 1962 and was last renovated in 1999. The City has had maintenance problems with the distributor arm freezing and becoming inoperable in the winter. The future treatment system will li ely not require the use of a trickling filter for CBOD removal. If primary clarifiers are not used, utilizing this fi ed film process is not advised in the future. Recommend the trickling filter be demolished.

Trickling Filter

J. RBCs

The RBCs were constructed in 19 7 and have reached end of their life. There are four trains of 5 RBC units each for a total of 20 units. The RBC's have had several maintenance issues recently and City staff have struggled to keep enough units in operation to handle plant loadings.

The RBCs have served the City of Webster City well over the past 35 years, however similar to primary clarifiers and trickling filters, RBCs do not fit well with biological nitrogen and phosphorus removal processes. Recommend the RBC's be demolished and replaced with activated sludge process.

RBC

K. Final Clarifiers

Both of the concrete clarifier structures were constructed in 1977 and mechanisms replaced in 1999. The units cannot be reused if the treatment process is moved to the new site south of town. Recommend the structures be demolished. The City may e tend the Boone River bi e trail through this area after the trickling filter and final clarifiers are demolished.

Final Cl ri ier

L. Chlorine Contact Basin

The chlorine contact basin was constructed in 1977. The proposed outfall to the Boone River is located about 1.5 miles south of the existing chlorine contact basin, near the new treatment plant site. It is not economically feasible to pump water from the new site to the e isting chlorine contact basin for disinfection prior to discharge. Recommend the chlorine contact basin be demolished and new disinfection treatment be constructed at the new wastewater site.

M. Anaerobic Digesters

The primary and secondary anaerobic digesters were constructed in 1939 and 1977. Equipment was updated 1999 and is now 23 years old and has reached the end of it's useful life. The digesters will not be used for future treatment process because primary clarifiers will not be used. Recommend the digester tanks and equipment be demolished. New aerobic digesters are planned to be constructed at the new wastewater plant site south of town.

An erobic Digester (near) Biosolid Storage Tank (far)

N. Biosolids Storage Tank

The biosolids storage tank is an above grade bolted steel tank that was constructed in 1999. The City has had trouble pumping heavy solids out of the tank and fully pumping the tank down. There will likely not be a future need for the tank at the existing plant site. Alternative uses for the tank could be explored during design of the proposed improvements. Recommend reviewing feasibility of disassembling, moving, and reconstructing the tank at the new site with tank contractors during design phase.

O. Need for Improvements

The need for improvements to Webster City's existing wastewater treatment system is derived from the aging infrastructure (most components have been in service for more than 20 years), the need for increased treatment capacity, and the inability of the current process to meet future TN and TP limits as part of Iowa's Nutrient Reduction Strategy.

I . A TERNA IVE DESIGN CONCEPTS A D COST A A YSIS

A. Iowa Nutrient Reduction Strategy

In ay 2013, the Iowa Nutrient Reduction Strategy was established to reduce nutrients (nitrogen and phosphorus) delivered to Iowa waterways and the Gulf of Mexico. Evaluation of treatment facility modifications for TN and TP removal is required for all publicly owned treatment works POTWs) with greater than 1.0 MGD average wet weather design flows. NPDES permits will be amended to include construction schedules for implementing nutrient reduction technologies. The nutrient reduction evaluations will be based on a goal of achieving annual average mass limits equivalent to effluent concentrations of 10 mg/L TN and 1 mg/L TP for plants that treat normal domestic strength sewage. The treatment goals for plants that treat sewage with a significant amount of high strength industrial wastewater are 66% TN and 75% TP removal.

Webster City completed an evaluation of nutrient reduction as required by the Iowa Nutrient Reduction Strategy and submitted the report to DNR in February 2018. The existing fi ed film biological treatment process cannot be economically modified for significant TN reduction. The proposed new treatment facility will include TN and TP removal processes with a goal of achieving annual average mass discharge limits equivalent to 66% TN reduction and 75% TP reduction.

The discharge permit limits will be established by DNR after a si month process startup and optimization followed by a twelve month performance evaluation period. DNR will amend the NPDES discharge permit after the performance evaluation period with the addition of average annual TN and TP mass discharge limits that are based on the demonstrated plant performance.

B. General Treatment Alternatives

There are several treatment process of alternatives that are given consideration when determining effective wastewater treatment improvements. For Webster City, these general alternative solutions include: 1) rehabilitation and/or expansion of existing attached growth treatment process and 2) construction of a new suspended growth activated sludge process. All alternatives discussed herein include the following improvements:

- Upgrading the existing main lift station screening, grit removal and pump capacity to handle future peak flows.
- Construction of forcemain to new site south of town.
- Construction of new treatment facility south of town including 12 MG wet weather flow equalization.

Rehabilitation and e pansion of e isting treatment processes is not a viable option due to the limited ability of fi ed film treatment processes such as trickling filters and RBC's to remove TN and consistently meet stringent ammonia discharge limits. The trickling filter and RBC's could be used as part of a future activated sludge system for CBOD removal, however, using attached growth process ahead of activated sludge will create carbon deficient environment and supplemental carbon source will be required for denitrification. Because of this, the fi ed film processes are not recommended to be reused in future improvements. Another contributing factor making rehabilitation and expansion of the existing site not feasible is the inadequacy of space for expansion. As discussed in Section II, total plant CBOD loading is increasing 157 percent and TKN loading is increasing 188 percent. These significant increases in loading combined with additional treatment requirements result in greater room required for the future treatment facility. The e isting plant site is constrained by the floodplain and proximity to residences.

The other general alternative is to construct a new mechanical facility that is specifically designed to meet the City's future treatment needs. The new facility would utilize proven technologies to achieve biological nitrogen and biological or chemical phosphorus removal. After the facility is constructed, feasible effluent limits for TN and TP would be determined twelve months after the treatment process is optimized and evaluated for nutrient removal performance. The facility would be constructed on property owned by the City south of Highway 20. Components of the existing treatment facility, including grit removal and raw pumping station, would be evaluated for use in the proposed facility.

The next part of this Section provides a discussion of potential treatment options for Webster City's wastewater system improvements. The objectives of this discussion are to 1) identify potential treatment options and 2) select alternatives for further evaluation.

C. Discussion of Treatment Options

Webster City must construct a new treatment process to meet future effluent discharge limits. Several different technologies may be considered for meeting the discharge limits. The following paragraphs discuss an exhaustive list of these options. While many are not feasible, this section is included to provide an overview of all systems considered.

1. Non-Mechanical Treatment Facility

a Aerated Lagoon System

An aerated lagoon system is designed to reduce the solids and biochemical oxygen demand of the wastewater through settling and decomposition by the bacteria living in the system. These systems can be designed as continuous discharge or controlled discharge. At a minimum, these systems consist of two or more aerated cells (of equal size) and one quiescent cell that provides 2 days of storage. Depending on the strength of influent wastewater, cell requirements may increase in number and size. Seasonal ice cover and sludge accumulation also factor into the sizing of aerated lagoon systems. Lagoon depth must be at least 5 five feet, but are typically in the 10-15 feet range.

There are several disadvantages to using a lagoon system to treat Webster City's wastewater. Webster City's e isting treatment facility does not include any lagoons so all lagoon construction would be new construction. Significant land area (greater than 700 acres) would be required for a lagoon system.

Aerated lagoon systems are not reliable for ammonia removal in cold weather conditions due to the relatively long hydraulic residence time and reduced nitrification rates at water temperatures below 50 deg. F.

As outlined in Section IVA, Major Facility's (greater than 1 MGD) must comply with the Nutrient Reduction Strategy as required by the facility's NPDES permit. Aerated lagoon systems are not capable of significant total nitrogen removal or biological phosphorus removal. Aerated lagoon system for Webster City would not be approved by IDNR as an accepted treatment technology. The aerated lagoon process was eliminated from further consideration for these reasons.

b) Constructed Wetlands

Constructed wetlands may be used to treat relatively low flow and low strength waste streams. The flows and loads for Webster City, which includes multiple significant industrial users, are much greater than what can be feasibly treated by a constructed wetlands treatment system. Additionally, constructed wetlands have consistently failed in northern climates due to freezing. For these reasons, constructed wetlands were eliminated from further consideration.

2. Mechanical Wastewater Treatment Facility

Mechanical wastewater treatment systems utilize a combination of physical, biological, and chemical processes to achieve treatment objectives. Mechanical facilities may include a combination of the following treatment components: preliminary treatment, primary treatment, secondary treatment, tertiary treatment, disinfection, and biosolids handling and disposal. The purpose and function of each of these components is described below:

- *Preliminary Treatment* – Involves the removal of constituents that can clog or damage equipment and interfere with downstream processes. These constituents may include inorganic solids such as rags, paper, wood, and garbage, as well as oil and grease. General technologies utilized include screening and grit removal devices.
- *Primary Treatment* – Involves the physical separation of suspended solids utilizing clarifier technology. This separation reduces solids not removed in preliminary processes, as well as removal of a portion of influent biochemical oxygen demand (BOD) that is associated with the organic solids removed in the primary treatment process.
- *Secondary Treatment* – Involves the removal or reduction of contaminants that are not removed during primary treatment. This can be done through a combination of biological, physical, and chemical processes. Biological treatment involves the oxidation of pollutants such as organics and nitrogen through bacterial metabolism. Biological processes are often combined with physical processes such as clarification or membrane filtration to retain bacteria and remove suspended solids from the waste stream. Chemicals are commonly added to optimize the process or to help remove pollutants such as phosphorus. A wide variety of secondary treatment processes are utilized in the wastewater industry. Raw wastewater characteristics and flow rates dictate which processes are necessary.
- *Tertiary Treatment* – Involves the use of advanced wastewater treatment technologies to further remove pollutants from wastewater. Tertiary treatment technologies include tertiary sand filtration, ion exchange, carbon adsorption, and membrane processes. Tertiary treatment is required for plants with very stringent total suspended solids, CBOD, TN and TP discharge limits. Tertiary treatment may also be required for removal of specific contaminants such as organic contaminants that are not removed in conventional biological secondary treatment or heavy metals.
- *Disinfection* – Involves the destruction or inactivation of waterborne pathogens prior to discharging effluent to receiving waters for the purpose of minimizing public health threats. Disinfection can be done both chemically

and physically. Chemical disinfection most commonly includes the use of chlorine-based products to destroy pathogens. Physical disinfection most commonly includes the use of ultraviolet irradiation (UV) to inactivate the pathogens' ability to replicate.

- *Biosolids Handling and Disposal* – Involves the processing, storage, and disposal of biosolids generated at a wastewater treatment facility. Biosolids are derived from excess growth and subsequent disposal of bacteria and other microorganisms in the biological treatment process, as well as solids collected in the primary treatment process. Biosolids are collected and further stabilized through biological processes and stored/dewatered over the year to increase solids concentration. Depending on the degree of stabilization, biosolids are most commonly disposed through land application.

In most domestic wastewater treatment applications, biological secondary treatment is the key component in the process. Biological treatment generally utilizes either suspended growth or attached growth processes. In suspended growth systems, microorganisms responsible for the oxidation of pollutants are suspended in the wastewater through mixing and aeration. In attached growth systems, the microorganisms become attached to a media where they are exposed to organic matter as wastewater flows by the media. There are also hybrid systems which utilize a combination of suspended growth and attached growth processes. Table 4.1 summarizes commonly used biological secondary treatment processes.

Table 4.1: Mechanical Wastewater Treatment Processes

Type	List of Processes
Suspended Growth	- Extended Aeration Activated Sludge - Oxidation Ditch - Sequencing Batch Reactor (SBR) - Membrane Bioreactor (MBR)
Attached Growth	- Trickling Filter (Existing) - Rotating Biological Contactor (RBC) (Existing)
Combination	- Biological Aerated Filter (BAF) - Integrated Fixed-Film Activated Sludge (IFAS)

Important criteria for selecting a treatment process are as follows:

- Ability of process to meet effluent quality requirements
- System reliability and resiliency
- Ability of process to maintain performance during hydraulic fluctuations
- System expandability to meet future capacity requirements
- System adaptability to meet future effluent quality requirements
- Non-proprietary technology, if possible
- Capital costs
- Operation and maintenance costs (O&M)

The following paragraphs summarize many of the treatment processes listed in Table 4.1.

a) Extended Aeration Activated Sludge

Extended aeration activated sludge process utilizes an aeration system to provide dissolved oxygen for biological metabolism and mixing for suspended growth. Air is supplied from positive-displacement or centrifugal blowers and is dispersed in the aeration basins via a network of fine-pore diffusers that maximize oxygen transfer and provide mixing. In a typical activated sludge process, incoming wastewater undergoes screening and grit removal prior to aeration. From the aeration basins, wastewater is conveyed to the final clarifiers where solids and biomass are settled out and either recirculated back into the aeration basins or wasted to the biosolids processing system. Clarified effluent travels over the weirs and is conveyed to the disinfection system.

Extended aeration, which is a modification of conventional activated sludge treatment, eliminates the need for a primary clarifier and utilizes a larger aeration basin and longer solids retention. Extended aeration is known to produce high quality effluent and is a widely used, reliable technology. In addition, extended aeration systems are adaptable to achieve nutrient removal and produce a low level of sludge in comparison to the conventional activated sludge process. For these reasons, *extended aeration should be considered for the Webster City wastewater system improvements.*

b) Oxidation Ditch

The oxidation ditch process is a variation of the activated sludge process. The oxidation ditch process typically includes course screening, grit removal, one or more closed loop aerated channels for biological treatment, secondary clarification, and disinfection. Their closed-loop configuration are often called “racetrack type” reactors, as wastewater travels in a circle until it is released from the reactor and travels to the secondary clarifiers. Long solids retention times (SRTs) associated with oxidation ditch system allow for a high degree of nitrification. An oxidation ditch system can be operated to achieve partial denitrification with the addition of an anoxic tank and proper recirculation, however TN removal can be difficult to control. Biological phosphorus removal is also possible with the addition of an anaerobic tank prior to the ditch. Key advantages include: low sludge production due to long solids retention times; adaptability to achieve nutrient removal; and common wall construction of racetrack tank design. Disadvantages include: potential freezing problems and loss of nitrification in cold weather with surface aerators; relatively high maintenance requirements; less redundancy provided in typical designs as compared to extended aeration activated sludge; more difficult to control process compared to other activated sludge options; limited control and flow metering of recirculation streams; and the system is considered proprietary so limited equipment options are available. The oxidation ditch process has several drawbacks compared to extended aeration activated sludge but oxidation ditches have gained popularity in recent years primarily due to claimed economic advantages. Due to these reasons*, the oxidation ditch process should be considered for the Webster City wastewater treatment facility improvements.*

c) Sequencing Batch Reactor (SBR)

Sequencing batch reactors (SBRs) are an activated sludge-based technology which incorporates the aeration, anaerobic/anoxic, sedimentation, and decant functions in a single five-stage batch reactor process. The five stages are as follows: fill, react, settle, decant, and idle. In order to provide continuous treatment, three reactors (minimum) are utilized with the capability to meet design capacity requirements with one reactor out of service. Flow equalization is typically provided to handle peak wet weather flows and reduce reactor basin sizes. Advantages include potential reduced area required for process tanks and potential for lower capital costs due to construction of fewer concrete structures, namely clarifiers. Disadvantages include higher operational complexity and controls, higher operation and maintenance costs, reliability concerns and limited nutrient removal capabilities, large reactor tank volume required. SBRs are not capable of reliably achieving the same level of nutrient removal as other extended aeration activated sludge processes, since the anoxic and anaerobic conditions are not controllable.

Enhanced biological phosphorus removal is difficult to achieve in a batch process tank because an anaerobic environment must be provided for phosphorus accumulating organisms (PAO) to gain a competitive advantage and proliferate as described in Section IV.D.1. If nitrate is present in the anaerobic step of a sequencing batch reactor, PAO growth will be inhibited by denitrifying organisms. If PAO growth is inhibited, biological phosphorus removal will be reduced.

The ability to correct operational issues, such as poor settleability of solids, is also greatly reduced in a SBR because multiple processes occur in the same tank. A conventional activated sludge system utilizes separate tanks for bioreactors and sedimentation basins which, among other things, allows the operator to treat wastewater with chemical addition and polymer prior to the sedimentation step at the clarifiers. The use of one tank for multiple processes also increases the negative effects of taking one SBR tank offline because in that one tank, the plant is losing treatment capacity for hydraulic and pollutant loading for anaerobic, anoxic, aerobic and sedimentation tanks.

Due to the operational complexity and significant reliability concerns, which are not offset by significant cost savings, *the SBR process has been eliminated from further consideration.*

d) Membrane Bioreactor (MBR)

Membrane bioreactors (MBRs) utilize the extended aeration activated sludge treatment process. However, the major difference is that final clarifiers are replaced with micro- or ultrafiltration membranes for physical solids separation. The use of membranes for solids separation is advantageous in that system performance is not dependent on sludge settling characteristics, which can be problematic in conventional systems. Also, membranes remove virtually 100% of solids from the treated effluent and retain all biomass in the biological system. This allows the system to run at higher solids concentration and significantly longer SRTs without a reduction in performance – effectively reducing reactor size requirements and minimizing solids production.

Despite smaller land area requirements, membranes are expensive and need frequent replacement every 3 to 5 years. Capital costs are similar or slightly higher compared to conventional systems, but life-cycle costs are known to be higher due to membrane replacement. More importantly, operation and maintenance costs are much higher due to fouling control and chemical cleaning requirements. Fouling control can be difficult to manage since filterability is highly dependent on wastewater characteristics – especially temperature.

Although MBR systems are known to produce extremely high effluent quality, other activated sludge based systems can produce high effluent quality at a lower operating cost. MBR systems are most commonly used in low flow systems that have both space restrictions and require extremely high effluent quality. Webster City's situation is fairly conventional and does not fall under any of these requirements; *therefore, an MBR treatment system has been eliminated from further consideration.*

e) Biological Aerated Filter (BAF)

Biological aerated filters (BAF) are a combination system in which wastewater flows upward through tanks that contain media. The media is tightly packed and provides a surface for biofilm to attach. Air is added to the bottom of the cell to provide oxygen for bacterial metabolism. Suspended and attached growth biomass provide higher efficiency treatment and reduce the required tank volume as compared to conventional activated sludge. The wastewater flows through the media and out of the tanks over baffles. The upward flow of wastewater provides filtering, as well as removal of microorganisms, therefore reducing or eliminating the need for clarification.

The combination of increased treatment efficiency and reduced tank sizes along with the elimination of secondary clarification significantly reduce land area required to construct a treatment facility. However, BAF treatment facility capital costs are significantly higher than conventional activated sludge due to the following reasons:

- BAF facilities are enclosed in one large building. This requires a large building with increased mechanical, electrical, and plumbing costs as well increased utility and operations and maintenance costs over the life of the facility.
- BAF facilities use tertiary filtration instead of sedimentation type clarifier tanks. This reduces land requirements and improves effluent quality but increases capital costs for equipment and facilities.

A typical BAF treatment system includes fine screening, grit removal, primary flocculation and clarification, biological aerated filtration, and disinfection. Advantages include the elimination of secondary clarification, minimal space requirements, and capacity to handle wide flow ranges and temperature variations. Disadvantages include increased operational complexity, increased preventative maintenance, and higher capital costs.

In this case, increased capital, operation, and maintenance costs are not offset by the advantages of space reduction. Webster City is not constrained by land requirements for facility expansion or for biosolids land application. Therefore, the *BAF system has been eliminated from further consideration.*

f) Integrated Fixed-Film Activated Sludge (IFAS)/Moving Bed Bioreactor (MBBR)

Integrated Fixed-Film Activated Sludge (IFAS) and is a hybrid type system that mixes components from conventional activated sludge and BAF systems. Similar to a BAF, the IFAS system uses a combination of suspended and attached growth with diffused aeration to provide oxygen to the process. The primary difference is the IFAS system relies on conventional sedimentation in a separate basin instead of upflow filtering in the treatment cell for final clarification. IFAS systems are typically implemented as retrofits of existing activated sludge facilities because the attached and suspended growth combination provides increased treatment efficiency so that treatment capacity is increased without increasing tank volume. Also, loadings to the secondary clarifiers are typically unchanged so no upgrades are required for settling with increased treatment capacity. An activated sludge facility retrofit typically involves installing media in the aeration basins and screens at the basin outlets to retain the media. For greenfield projects, IFAS require reduced area for siting a plant as compared to conventional activated sludge systems because of the increased treatment efficiency from attached and suspended growth biomass. A typical IFAS system includes fine screening, grit removal, primary clarification, IFAS, secondary clarification, and disinfection.

Moving Bed Biofilm Reactor (MBBR) is similar to the IFAS system with treatment provided by attached growth on synthetic media with diffused air aeration provided. However, the MBBR does not include a return activated sludge RAS recirculation line from the clarifiers to the bioreactor so it does not have the suspended growth the IFAS and conventional activated sludge has. The advantage to an MBBR system is a reduced area required for bioreactors.

Webster City does not have an activated sludge system to retrofit with IFAS and the city is not limited by tight land constraints for future plant construction. The benefits provided by the IFAS and MBBR systems do not suit the needs of Webster City so the additional costs cannot be justified. Therefore, *IFAS and MBBR systems have been eliminated from further consideration.*

3. Biosolids Handling and Disposal

a) Mechanical Treatment Facilities

Mechanical treatment facilities generate excess biosolids that must be removed from the system. Biosolids are derived from two primary sources: 1) excess biological growth wasted from the biological treatment process and 2) influent solids captured in primary/secondary treatment. Proper handling and disposal of biosolids is an important aspect of wastewater treatment. A method that is economical and acceptable to human health, the environment, and aesthetically must be selected.

The most practiced disposal method for rural communities like Webster City is land application, which the City currently practices. Biosolids storage can be a major cost and economic handling and storage must be considered. Increasing the solids content of the sludge is a cost effective way to help process, store and dispose of the solids. Biosolids from the activated sludge process would be thickened to about 4.5% total solids (TS) in a rotary drum thickener and pumped to an aerated digester for stabilization.

The aerated digester is a covered tank with a coarse-bubble aeration system for mixing and odor reduction. Digester volume will be adequate to store 60 days of sludge at 4.5% TS at AWW design conditions. Piping and valves could be installed in the digester to decant supernatant from the tanks <u>if the process is using chemical phosphorus removal</u>. Supernatant would be recycled back to the aeration basins – effectively concentrating the biosolids in the tank. Increasing solids concentration reduces storage volume and associated land disposal costs.

Decant cannot be returned to the treatment process unless chemicals are added to the digesters for precipitation of phosphorus if biological phosphorus removal is being utilized because the PAOs will release phosphorus in the digester. The decant water from a biological phosphorus removal process contains a concentrated stream phosphorus that will flow through the treatment process and be discharged to the receiving stream unless an aluminum or iron compound is fed to the digesters prior to decanting.

The biosolids could be further dewatered to 20 to 25% TS by use of a mechanical screw press or rotary press following the aerated digesters. The pressed cake material is difficult to pump and is typically handled as a dry material and stockpiled. The supernatant from the press is returned to the aeration basins for treatment and eventual discharge to the river. Pressing the sludge greatly reduces the volume required for 360-day storage and the amount of water hauled for biosolids disposal. The increase in CBOD, TSS and TKN design loadings and the addition of total phosphorus discharge limits will result in a significant increase in annual biosolids production. Dewatering of the biosolids to 20 to 25% TS appears to provide an economic and operational advantage. Farmers prefer dewatered biosolids for land application.

If biosolids are not dewatered, biosolids are pumped from aerated digester to a storage tank with a 180-day minimum capacity at 4.5% TS at AWW design flow. At the end of the storage period, the sludge is applied to agricultural land according to U.S. EPA guidelines. The concrete storage tanks will contain mi ers to keep the solids homogenous during application.

The City could contract with a licensed applicator for sludge hauling and land application, or provide equipment and training for their wastewater operators to handle the process. Nutrients in the sludge would be available for plant growth and humus in the sludge acts as a soil conditioner. Application to agricultural land would occur during periods when crops are not growing or on property that is temporarily out of crop production. The City currently works with a land application contractor for disposal of biosolids on nearby agricultural fields.

The facility would test for fecal coliform to meet the pathogen reduction requirements prior to land application. The vector attraction reduction would be expected to be met by injection of the solids, or if injection was not available, testing the oxygen uptake rate. The storage tank would be designed to allow lime treatment of the solids if the above method did not work, or if bul ing of the solids were required for exceedance of the metal ceiling limits.

b) Other Biosolids Technologies

An alternative to aerated digestion would be consideration of other biosolids technologies. After reviewing options for increased biosolids treatment to reach an EPA Class A product, the increased expense was not justifiable since the City is surrounded by agricultural options for disposal.

D. Alternatives Considered

A discussion of potential wastewater system improvement alternatives was conducted in Section IV.B of this report. Based on these discussions and knowledge of Webster City's treatment needs, the following e tended aeration activated sludge alternatives that include nutrient removal will be considered in detail throughout the rest of this report:

Alternative No. 1 - University of Capetown (UCT) Process

Alternative No. 2 - Modified Ludzack-Ettinger (MLE Process

Alternative No. 3 - Oxidation Ditch w/ Biological Nutrient Removal

Note: Each of these alternatives includes upgrading the existing raw lift station, as well as renovating the preliminary treatment process at the existing plant site.

1. Alternative No. 1 – Extended Aeration UCT Process

This alternative involves the construction of a new extended aeration treatment facility that utilizes the principles of the activated sludge process for biological nutrient removal referred to as the University of Cape Town (UCT) process. The UCT process achieves biological nitrogen and phosphorus removal with the use of anaerobic, anoxic, and aerobic treatment tanks. The facility would be designed to achieve biological nutrient removal and to treat 20-year projected flows and loadings as specified in Section II and continuously discharge effluent to the Boone River at proposed Outfall 001, just downstream of Drainage Ditch No. 166. Figure 4.1 shows the proposed process flow diagram for this alternative.

Construction of the extended aeration treatment facility includes the following major process components:

- Renovate Raw Waste Lift Station at Existing Plant Site:
  - Install mechanical bar screen in existing channel with screenings discharge at grade.
  - Demolish existing comminutors.
  - Renovate existing aerated grit removal system.
  - Replace existing lift pumps with dry pit submersible wastewater pumps sized to pump all wastewater to the proposed treatment plant site.
- Wet Weather Flow Equalization Lagoon:
  - 14 million gallon operating capacity.
  - Magnetic flow meter for flow measurement in and out.
  - Synthetic liner.
  - Pumped return to head of treatment process.
- Preliminary Treatment Building:
  - Mechanical fine screen
  - Vortex grit removal and classifier
  - Equipment located at grade for ease in maintenance and material (screenings and grit) removal.
  - Magnetic flowmeter for flow measurement
- Operations Building:
  - Aeration blowers
  - Clarifier RAS/WAS/Scum pumps and associated piping and valves
  - Rotary drum thickener for sludge thickening

- Digester transfer pumps
- Chemical feed pumps and storage
- Electrical and controls
- Process operations lab, office, meeting room, and restrooms

- Aeration basin treatment train – Two complete trains for redundancy.
    - Anaerobic/Anoxic Control Structure
        - Provides even flow split to the two treatment trains.
        - RAS & MLR may be sent to either the anoxic tank (normal operation) or anerobic tank.
    - Anaerobic tank
        - Two (2) tanks at 145,000 gallons each for 290,000 gallons total capacity
        - 18-foot side water depth
        - Jet mixing system
    - Anoxic tank
        - Two (2) tanks at 250,000 gallons each for 500,000 gallons total capacity
        - 17-foot side water depth
        - Jet mixing system
        - Anoxic liquor return pump
        - Baffle wall tank
    - Aeration basin control structure
        - Provides even flow split between two (2) aeration basins
        - Magnesium hydroxide feed location (if required due to alkalinity constraints)
    - Aeration tanks
        - Two (2) tanks at 1.3 MG each for 2.6 MG total capacity
        - 16-foot side water depth
        - Fine bubble diffused aeration
        - Jet mix aeration for last baffled section for enhanced DO control
        - Mixed liquor return pump
        - Baffle wall tank
- Rapid mix tank
    - Mechanical mixer
    - Chemical addition for phosphorous removal (backup to

    biological phosphorus removal)
  - Polymer addition
- Clarifier control structure
- Final clarifiers
  - Three (3) tanks at 68-foot diameter
  - 14-foot side water depth
- Fermentation Tank
  - 460,000 gallon capacity
  - Provide fermentation for 10-20% RAS and 0-10% raw waste at nutrient removal flow rate of 2.3 MGD for enhanced biological phosphorus removal.
- UV disinfection
- Magnetic flow meter or Pharshall flume for effluent flow monitoring
- Reaeration basin
  - Fine bubble diffused aeration
  - Provided to meet effluent DO limit
- Discharge at proposed Outfall 001
- RDT Holding Tank
  - One (1) tank at 270,000 gallon capacity located ahead of rotary drum thickener.
  - Reduce thickener hours of operation to plant staffing hours.
  - Insulated bolted steel or concrete tank
  - Covered to prevent excessive heat loss.
- Rotary Drum Thickener
  - Waste Activated Sludge (WAS) Thickening from less than 1% to 4.5%
  - 300 GPM at 0.6% solids
  - Located at Operations Building or Press Building
  - Reduce required digester volume and aeration capacity
- Aerobic Digester
  - Two (2) tanks at 395,000 gallons each for 790,000 gallons total capacity.
    - 60-days retention time and 15 deg. C at 4.5% TS at AWW design load (EPA Appendix B to Part 503)
  - 55-foot diameter
  - 22-foot side water depth.

    - Coarse bubble aeration for mixing and oxygen transfer
- Press Holding Tank
    - 80,000 gallons for one week storage to provide consistent feed stock to sludge press
    - Bolted steel or concrete tank.
- Press Building
    - Sludge dewatering press to increase solids content from 4.5% to 20%.
    - Polymer feed and storage
    - Located next to Cake Storage Building for conveyance of cake by belt or screw conveyor.
    - Liquid biosolids loadout option to bypass press
- Cake Storage Building
    - 365-days storage of dewatered cake biosolids
    - Approximate building dimensions 110-feet x 200-feet x 10-feet stacking height.

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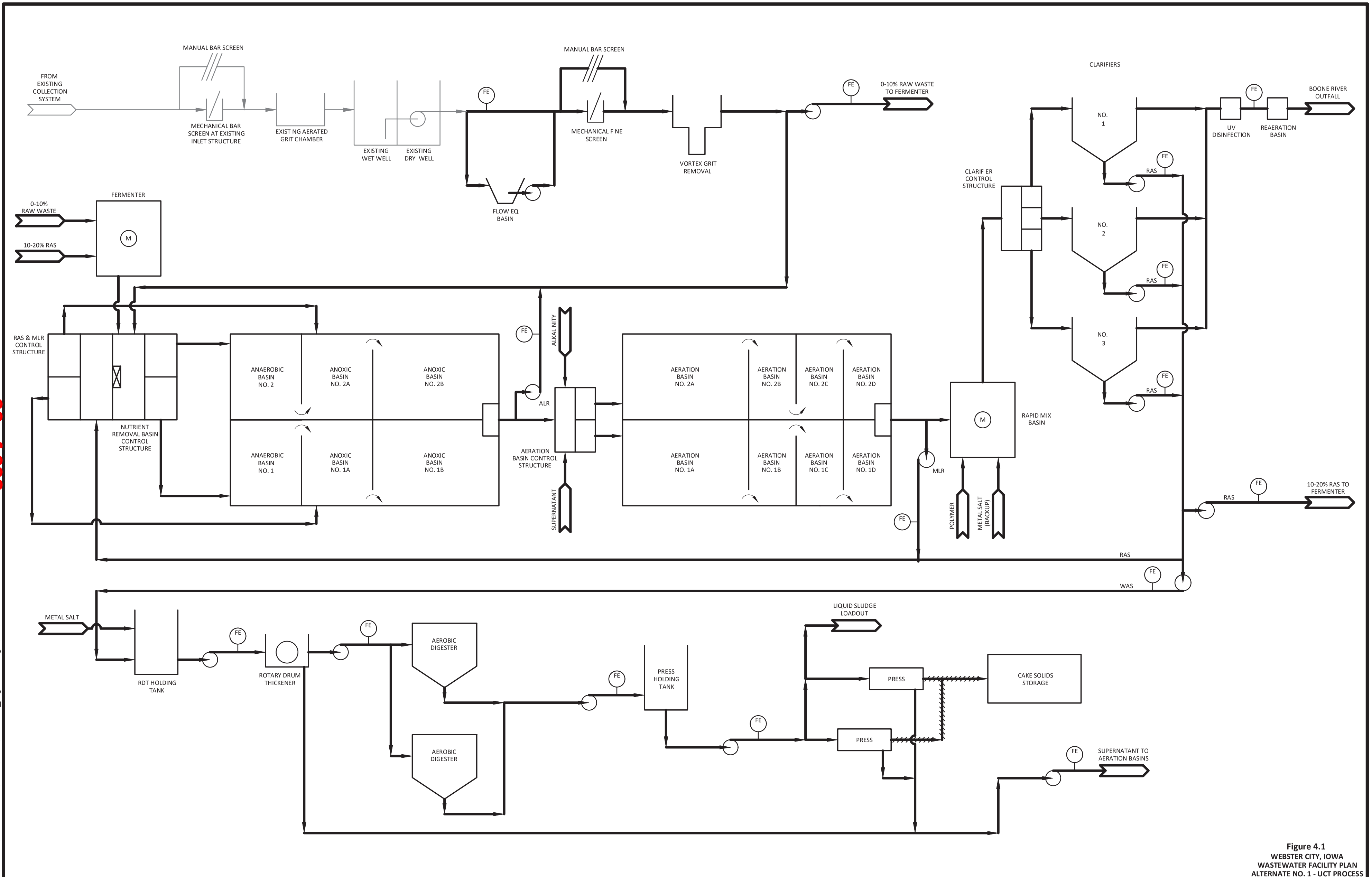

Figure 4.1
WEBSTER CITY, IOWA
WASTEWATER FACILITY PLAN
ALTERNATE NO. 1 - UCT PROCESS

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A detailed process design summary is included in Appendix J. The following is a description of the individual treatment components included in this alternative:

Raw Lift Station – The existing raw lift station would be renovated to pump influent wastewater from the gravity collection system approximately 20-feet below grade at the existing treatment plant site to the Preliminary Treatment Building for screening and grit removal at the proposed treatment plant site approximately 1.5 miles south. A mechanical bar screen would be installed in the existing influent channel to remove large debris prior to pumping. The existing aerated grit removal system would be renovated and remain in service. It is critical that large solids and heavy grit are removed from the wastewater prior to pumping to prevent possible solids accumulation and related maintenance issues in the 1.5 miles of force main piping. Screenings and grit discharge is planned to be at grade for ease of operations and maintenance. A building would be constructed near the existing influent channel to house a screenings washer compactor and dumpster.

It is likely that two submersible pumps sizes would be provided to cover wider range of flows, a smaller pump to handle typical daily influent flow and a larger pump to handle wet weather or peak day flows. Pumps would be sized to handle the PHWW flow with multiple pumps in operation at one time. Dry pit submersible pumps would be provided with redundancy due to the critical nature of their operation. The lift station discharge piping would include a magnetic flowmeter or Parshall flume for influent flow monitoring. Two forcemain pipes would be provided to cover a wider range of flowrates while still maintaining 1-2 ft/sec velocity at ADW flow to help prevent solids from settling out in the piping. Multiple forcemain pipes would also provide redundancy for the most common flow conditions, ADW and AWW.

Wet Weather Flow EQ Lagoon – As discussed in Section II, the City has a significant inflow and infiltration issue with MWW flow at 4.7 times the ADW flow and PHWW flow at 5.9 times ADW flow. The raw waste pumps and force main would be sized to pump the PHWW flow from the existing plant site to the EQ Lagoon at the proposed treatment plant site. All flow greater than 5.086 MGD (3,531 GPM) would be diverted to the EQ Lagoon for storage. Stored water would be pumped back to the head of the plant for treatment and discharge when influent flows decrease to less than 5.086 MGD. Piping to and from the lagoon would have flow meters for flow monitoring.

A preliminary Geotechnical report for forcemain, lagoon, and treatment plant construction is located in Appendix K. Borings SB-15, 16 are in the area of the proposed EQ lagoon and indicate bedrock is approximately 23-24’ below grade. Iowa DNR 18C.3.6.2 indicates a separation of 10 feet between the pond bottom and bedrock formations is recommended with a minimum separation of 4 feet required. Based on these the requirements, the bottom of the lagoon could be at least 13’ below existing grade. Plan to include a synthetic liner due to relatively shallow bedrock in the area.

Preliminary Treatment – Preliminary treatment consists of mechanical screening and grit removal. The screening system includes a mechanical screen and a manually-cleaned screen (or option for second automated screen) located in a separate channel or a back-up. After the screening system, wastewater flows to a vortex grit removal chamber to remove sand and grit. Grit is passed through a classifier and disposed of in a dumpster. These processes are to be located together in a preliminary treatment building at grade for ease of access for operations and maintenance, within the proposed facility location shown on Figure 5.3. The building is also separated to properly handle the corrosive nature of raw sewage thru ventilation, material selection, and coatings.

Anaerobic, Anoxic, and Aeration Basins – After preliminary treatment, water flows by gravity to the anaerobic tank. Biological phosphorus removal is accomplished by wasting mixed liquor that contains biomass with a very high phosphorus content. PAOs release phosphorus in the anaerobic tank and uptake (store) phosphorus in the aerobic tank. The anaerobic environment is important to biological phosphorous removal because it provides a selective advantage for phosphorous accumulating organisms (PAOs) to grow at a greater rate while the growth of other bacteria is inhibited due to the absence of nitrate and oxygen. Another benefit of the absence of nitrate and oxygen is the formation of readily biodegradable substrates such as volatile fatty acids through the fermentation process that are stored and used exclusively by the PAOs throughout the anoxic and aerobic processes. Nitrate and dissolved oxygen in the anaerobic basin inhibit the biological phosphorus removal process.

A RAS fermenter basin is included for the generation of volatile acids from a blend of RAS and raw wastewater. The use of RAS fermentation has proven beneficial for biological phosphorus removal processes.

Return activated sludge (RAS) from the clarifiers and mixed liquor return (MLR) from the aeration basins are pumped to an anoxic basin located downstream of the anaerobic basin. Nitrate is removed in the anoxic basin. Anoxic mixed liquor is pumped from the anoxic basin to the anaerobic basin to provide needed biomass that contains very low or no nitrate.

After the anoxic tank, wastewater flows by gravity to the aeration basin control structure. The control structure provides an even flow split between the two aeration basin treatment trains.

Biological nitrogen removal is accomplished by nitrification in the aerobic tank and denitrification in the anoxic tank. Nitrification is the conversion of ammonia (NH_3)or ammonium (NH_4^+)to nitrate (NO_3^-). Denitrification is the conversion of nitrate to nitrogen gas (N_2), which is released to the atmosphere, and the nitrogen is effectively removed from the wastewater stream.

Nitrate produced in the aerobic zone is returned to the anoxic zone by the mixed liquor return pump and by the RAS from the clarifiers. A portion of the influent CBOD is consumed by the bacteria during denitrification. As previously mentioned, RAS is returned from the clarifiers to the start of the anoxic zone to ensure that nitrate is not introduced to the anaerobic zone where it would interfere with the biological phosphorus removal process. The ability to send RAS and MLR to the anaerobic tank may be included as a secondary option (convert anerobic tank to anoxic).

The final step in the biological treatment basins is the aerobic tank or aeration basin. The aerobic tank provides an oxygen rich conditions that allows the nitrification process to thrive. The aeration basins provide an optimal environment for aerobic organisms to grow and metabolize incoming organics and ammonia. The PAOs uptake phosphorus in the aeration basins using stored substrate from the anaerobic process.

The extended aeration system uses fine-bubble diffusers to transfer dissolved oxygen into the wastewater (generally ≥ 2 mg/L). Turbulence generated by the diffused air system also provides sufficient mixing for proper contact between organics/nutrients and the bacteria living in the system. Air is supplied by blowers located in the operations building. The aeration basins are sized to limit oxygen uptake rate to 40 mg/L/hr and mixed liquor suspended solids to 5,000 mg/L and maintain at least 18 hours hydraulic residence time (HRT) in the basin. Solids are retained in the system for about 20 to 25 days, which decreases excess biomass production compared to conventional systems and reduces the size of the biosolids handling facilities. The recycle rates from the anoxic to anaerobic basins and the aerobic to anoxic basins are typically 3 to 4 times the influent flow. This results in approximately 75% TP and TN removal efficiency.

A supplemental alkalinity source may be required based on influent loadings and recycle flowrates. Nitrification consumes approximately 7 grams of alkalinity as CaCO3 per gram of ammonia-N converted to nitrate. Denitrification produces approximately 3.5 grams of alkalinity as CaCO3 per gram nitrate-N reduced to nitrogen gas. If required, magnesium hydroxide may be added at the aeration basin control structure.

The system has two treatment trains for anaerobic and anoxic basins that spit to two aeration basins. This allows the number of anerobic and anoxic basin trains online to be operated separate from the aeration basins. One train of the anaerobic and anoxic tanks may be removed from service for repairs or maintenance and denitrification will be maintained by the remaining train. Redundancy in anoxic basins allows the plant RAS flow rate to be reduced from 150% of influent flow to 100% of influent flow by DNR design variance request. The reduction in RAS flow rate results in significant savings in pumps, piping, valves, and clarifier tank sizing.

TN and TP discharge limits will be on an annual mass basis so recirculation rates will be based on Nutrient Removal flow rate of 2.5 MGD. The anaerobic and anoxic tanks are equipped with jet mixing system to ensure completely-mixed conditions. The aeration basins are designed to operate in parallel, allowing one basin to be taken offline for maintenance or during low loading conditions. Each aeration basin train consists of a series of baffled tanks to limit hydraulic short circuiting. The last baffled section will have jet mix aeration for enhanced DO control. Effluent from the extended aeration system flows next to a rapid mix basin and clarifier control structure before continuing to the clarifiers.

Rapid Mix Basin – The rapid mix basin provides a location for chemical addition with mechanical mixing ahead of the clarifiers. Inhibited settling due to process upsets, industrial loads and other factors can be corrected by polymer addition to enhance floc formation and settling characteristics. The UCT process is designed to use biological phosphorous removal to meet potential future total phosphorous discharge limits, however chemical phosphorus feed equipment should be included as a backup to the biological process. Metal salts may be added at the rapid mix tank on a temporary basis to meet discharge limits. It is prudent practice to provide a backup to the biological process in the event of plant upsets or other operational issues. See note in Biosolids Handling and Storage section regarding increased sludge production for chemical phosphorus removal.

Final Clarification – Final clarifiers will be designed to meet solids separation and thickening requirements. The clarifiers are circular suction-type, with a rotating suction header and skimmer installed at the bottom of the clarifier to uniformly remove settled sludge. This mechanism includes a surface skimmer to remove floating scum. Scum is discharged to a manhole and eventually pumped to the biosolids handling and storage system. As previously mentioned, return activated sludge (RAS) is recirculated back to the anoxic tank by RAS pumps. As excess biomass accumulates in the system through biological growth, a proportional amount of solids needs to be wasted each day in order to maintain a steady-state system. This portion of the solids is termed waste activated sludge (WAS) and, through the operation of WAS pumps, the solids are periodically wasted to the biosolids handling and storage system.

Redundant final clarifier structures are necessary in case one clarifier is down for repairs or maintenance. The clarifiers are designed to meet IDNR design standards for the following maximum conditions:

- 1,000 gal./d/s.f. hydraulic loading rate at AWW + 0.5 MGD flow (peak mechanical plant influent flow condition)
- 30 lbs TSS/d/s.f. solids loading rate at AWW flow plus 100% RAS recirculation

Clarifiers are sized to treat 75% of the design conditions with the largest unit offline in accordance with IDNR design standards. Each final clarifier is 68 feet in diameter to satisfy these design requirements. Side water depth of 14 feet is used to provide adequate depth for settling additional solids generated by chemical phosphorus removal, should chemical phosphorus removal be required in the future.

Disinfection – Clarified effluent from the final clarifiers would be conveyed to a disinfection system before final discharge into the West Branch of the Floyd River. Two widely-used and effective disinfection options should be considered: chlorine-based disinfection and UV disinfection. Advantages and disadvantages of each disinfection option are summarized below:

<u>Chlorine Gas Disinfection</u>

Advantages:

- Overall cost effective
- Proven and robust technology
- Lower electrical costs

Disadvantages:

- Potentially hazardous
- Chemical costs
- Required limits for total residual chlorine (TRC) and potential compliance issues
- Requires larger contact basin than UV
- Regulatory requirements for bulk storage of gas cylinders

<u>UV Disinfection</u>

Advantages:

- Potentially safer method of disinfection
- No limits for TRC
- Minimal space requirements
- No chemical costs
- Operators typically prefer this option

Disadvantages:

- Potentially higher capital costs
- Energy costs
- Replacement costs
- Reduced effectiveness in turbid or high TSS effluent

Both systems are capable of achieving permit limits for E. Coli. A major advantage of selecting a UV disinfection system is the elimination of permit limits for TRC. UV also eliminates potential hazards associated with pressurized chlorine gas cylinders. However, long-term maintenance costs would likely be higher when considering replacement costs for lamps (4-5 years), quartz sleeves (5-8 years), and ballasts (10-15 years). Chlorine gas disinfection may have higher operations costs due to bulk storage regulatory requirements as well as ongoing monitoring and compliance with TRC limits.

Due to the non-monetary benefits of UV disinfection and operator preference, the cost analysis in Section IV.D and in Appendix I considers only UV disinfection for all proposed improvement alternatives.

Biosolids Handling and Storage – Due to long solids retention time, extended aeration systems produce a relatively low amount of excess biosolids in comparison to other conventional activated sludge systems. This is due to increased oxidation and decay of active biomass.

Phosphorus from the PAOs is released during digestion. Therefore, thickening and dewatering digested biosolids would lead to return of soluble phosphorus to the activated sludge process with the decant water. The biosolids must be thickened prior to digestion. A rotary drum thickener, with chemical addition, will increase solids content of the sludge from less than 1% to an estimated 4.5% TS. The solids content needs to be increased in order to reduce the required digester tank volume. Filtrate water from the thickener is returned to the aeration basin control structure and sludge is pumped to the aerobic digester. There is typically about 5% of the TS wasted each day that will recirculate back to the aeration basin in the filtrate water. This carry-over will be accounted for in the sludge wasting rates and the rotary drum thickener sizing.

The aerobic digester is a covered tank with coarse bubble diffusers for aerobic stabilization and mixing. Air would be supplied from positive displacement blowers located in the operations building. The tank will have adequate volume for 60-day retention time at design AWW flow and load sludge production rates to comply with EPA part 503 rules for stabilizing biosolids. After digestion, biosolids are pumped once or twice a week to a batch tank located ahead of the sludge presses for dewatering or to the liquid sludge loadout for land application.

The batch tank is a well mixed tank to provide the press with a more consistent feed stock and improve press performance and consistency. The sludge presses, with chemical addition, will increase solids content of the sludge from about 4.5% to an estimated 18-20% TS. The solids content needs to be increased to reduce the biosolids storage volume required and amount of water hauled for biosolids land application. Similar to the RDT, filtrate water from the press is returned to the aeration basin control structure. Metal salt addition is required at the press batch tank to tie-up soluble phosphorus released by PAOs in the aerobic digesters and prevent the soluble phosphorus from re-entering the activated sludge treatment process through the press filtrate. There is typically about 5% of the TS pressed each day that will recirculate back to the aeration basin in the filtrate water. The pressed material acts more like a solid material than liquid and is commonly referred to as cake or cake solids. The cake will be conveyed from the press to a covered bunker storage structure located adjacent to the press building by belt or screw conveyors. The cake material will need to be stacked in the storage building with an end loader a few times per week.

The covered bunker will be sized for 365-days storage at AWW loadings. The cake would be loaded into trucks once or twice a year and hauled off site for land application.

It is important to note that chemical phosphorus feed equipment for the rapid mix tank is provided in this alternative as a temporary backup to the biological process only. Chemical phosphorus removal produces additional sludge in proportion to the mass of phosphorus removed. The UCT alternatives in this report are not sized to handle chemical phosphorus removal sludge production rates. For more information on chemical phosphorus removal see sub-section included in Alternative No. 2.

Outfall Piping – A new outfall pipe to Boone River will be constructed for discharge of final effluent. The discharge point will be located just downstream of Ditch No. 166 on the south side of the treatment plant site. Consideration may be given to returning part or all of the plant effluent flow the ox bow lake located next to the existing treatment plant during final design. Waste load allocations for both discharge points were obtained for purposes of this facility plan and are included in Appendix G for reference.

2. Alternative No. 2 – Extended Aeration MLE Process

Alternative No. 2 is the construction of a new extended aeration treatment facility based on the Modified Ludzack-Ettinger (MLE) activated sludge process for biological nitrogen removal and chemical addition for phosphorus removal. Similar to Alternative No. 1, the facility would be designed to achieve nutrient removal and treat 20-year projected AWW flows and loadings as specified in Section II. The treatment plant would be continuous discharge to the Boone River at new Outfall 001. Figure 4.2 shows the proposed process flow diagram for this alternative.

Construction of the extended aeration treatment facility includes the following major process components:

- The following items are the same as Alternative No. 1, refer to part IV.D.1 for more information.
    - Renovate raw waste lift station at existing plant site.
    - Wet Weather Flow Equalization Lagoon.
    - Preliminary Treatment Building.
    - Operations Building.
- Aeration basin treatment train – Two complete trains for redundancy.
    - Anoxic Control Structure – Provides even flow split between two treatment trains.
    - Anoxic tank
        - Two (2) tanks at 325,000 gallons each for 650,000 gallons total capacity
        - 17-foot side water depth
        - Jet mixing system
        - Anoxic liquor return pump
        - Baffle wall tank
    - Aeration basin control structure
        - Provides even flow split between two (2) aeration basins

        - Magnesium hydroxide feed location (if required due to alkalinity constraints)
    - Aeration tanks
        - Two (2) tanks at 1.3 MG each for 2.6 MG total capacity
        - 16-foot side water depth
        - Fine bubble diffused aeration
        - Jet mix aeration for last baffled section for enhanced DO control
        - Mixed liquor return pump
        - Baffle wall tank
- The following items are the same as Alternative No. 1, refer to part IV.D.1 for more information.
    - Rapid mix tank
        - Only method for enhanced phosphorus removal for this process.
        - Mechanical mixer
        - Chemical addition for phosphorous removal
        - Polymer addition
    - Clarifier control structure
    - Three (3) final clarifiers
        - 74-foot diameter – Larger diameter required due to increased mixed liquor concentration compared to Alternative No. 1.
    - UV disinfection
    - Magnetic flow meter or Parshall flume for effluent flow monitoring
    - Reaeration basin
    - Discharge at proposed Outfall 001
    - RDT Holding Tank
        - One (1) tank at 242,000 gallon capacity located ahead of rotary drum thickener.
- Rotary Drum Thickener
    - Waste Activated Sludge (WAS) Thickening from less than 1% to 4.5%
    - 270 GPM at 0.9% solids
- Aerobic Digester
    - Two (2) tanks at 390,000 gallons each for 780,000 gallons total capacity.

- 60-days retention time and 15 deg. C at 4.5% TS at AWW design load (EPA Appendix B to Part 503)
- 55-foot diameter
- 22-foot side water depth.
- Coarse bubble aeration for mixing and oxygen transfer
- Press Holding Tank
  - 105,000 gallons for one week storage to provide consistent feed stock to sludge press
- Press Building
- Cake Storage Building
  - Approximate building dimensions 120-feet x 225-feet x 10-feet stacking height.

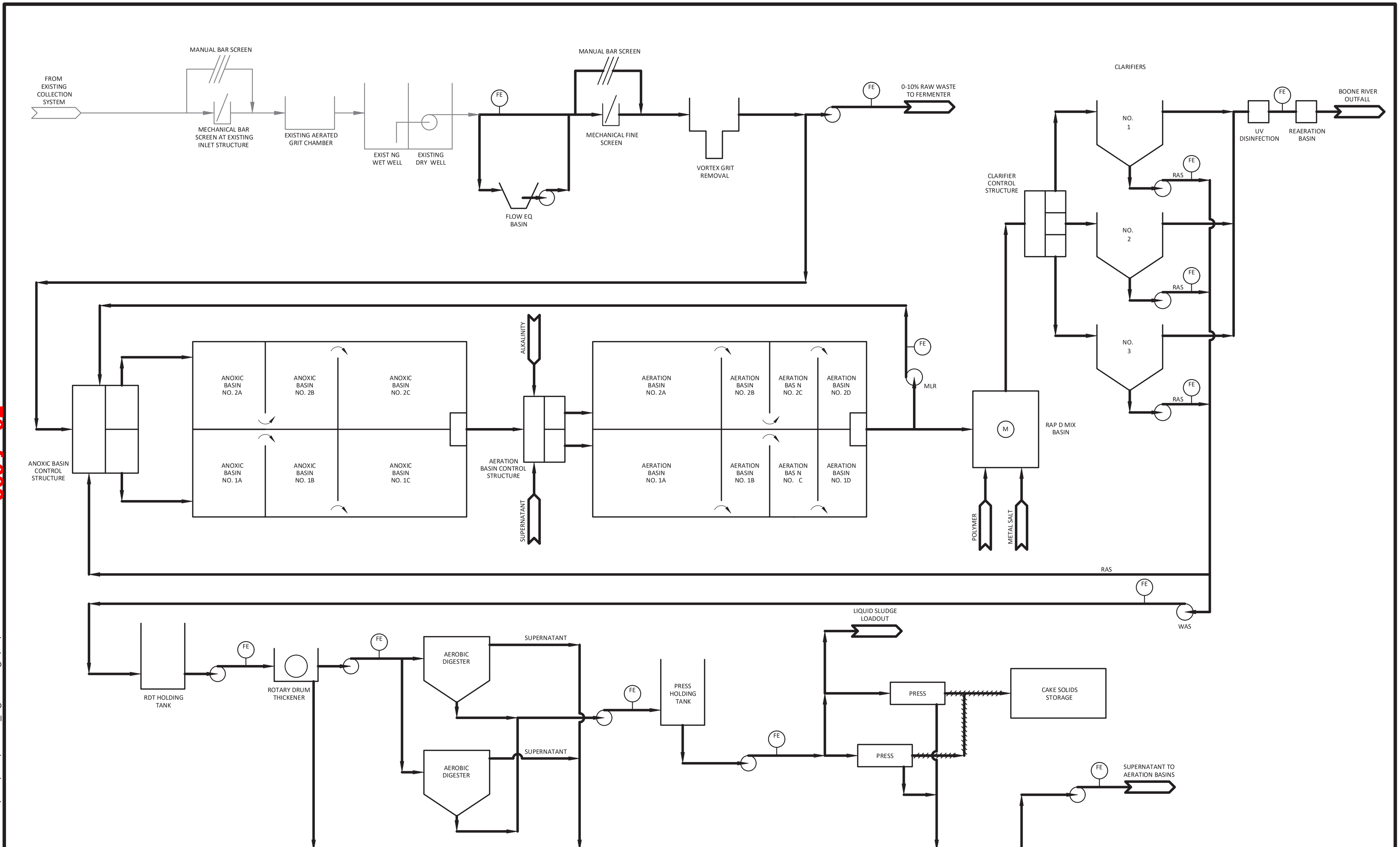

Figure 4.2
WEBSTER CITY, IOWA
WASTEWATER FACILITY PLAN
ALTERNATE NO. 2 - MLE PROCESS

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A detailed design summary is included in Appendix J. The following is a description of the individual treatment components included in this alternative:

Raw Lift Station – The raw lift station at the existing plant site would be constructed as described in Alternative No. 1.

Wet Weather EQ Lagoon – Wet Weather EQ Lagoon would be constructed as described in Alterative No. 1.

Preliminary Treatment – Preliminary treatment would be constructed as described in Alterative No. 1.

Aeration Basins – After preliminary treatment, raw wastewater flows by gravity to the anoxic basin control structure. The control structure provides an even flow split between the two anoxic basin treatment trains. A similar structure is also located ahead of the aeration basins. Decant water from sludge handling processes is re-introduced at the aeration basin control structure. Clarifier RAS is pumped back to the anoxic basin control structure.

Similar to the UCT process, TN removal is accomplished through nitrification in the aerobic tank and denitrification in the anoxic tank. Influent ammonia is oxidized to nitrate in the aerobic tank and nitrate rich mixed liquor is returned to the anoxic tank by a mixed liquor return pump. Nitrate rich RAS from the clarifiers is also returned the anoxic tank. In the anoxic tank, influent raw wastewater CBOD is used by denitrifying bacteria to convert nitrate produced in the aerobic cell to nitrogen gas. CBOD remaining after the anoxic tank is consumed in the aerobic tank. A return to influent flow ratio of 3:1 is typically used for 75% TN removal. As with the UCT process, the anoxic tank is located before the aerobic tank. .

Also similar to the UCT process, the MLE process may require alkalinity supplement which can be added if required. The MLE process has two treatment trains so that one train may be taken offline for maintenance.

The primary difference between the UCT and MLE processes is the method for phosphorus removal. The UCT process utilizes biological nutrient removal with an anaerobic tank to select for PAOs. The MLE process relies on chemical addition ahead of the clarifiers to tie-up the phosphorus and remove it from the wastewater stream through sludge wasting. Chemical phosphorus removal has significant impacts on sludge production as discussed in the Biosolids Handling and Disposal section below.

Effluent from the extended aeration system flows next to a rapid mix basin and clarifier control structure before continuing on to the clarifiers.

Rapid Mix Basin – The rapid mix basin provides a location for chemical addition with mechanical mixing ahead of the clarifiers. Ferric chloride or aluminum sulfate (alum) may be added here to carry out chemical phosphorus removal. Also, as with Alternative No. 1, polymer may be added here to help settle solids in the clarifiers. Inhibited settling due to process upsets, fluctuating industrial loads and other factors can be corrected by polymer addition to enhance floc formation and settling characteristics.

Final Clarification – Final clarifiers will be designed to meet solids separation and thickening requirements as described for Alternative No. 1.

Disinfection – Clarifier effluent is conveyed to a disinfection system before final discharge to Boone River. See Alternative No. 1 for disinfection system discussion.

Biosolids Handling and Storage – Extended aeration systems produce a relatively low amount of excess biosolids in comparison to other conventional activated sludge systems, however chemical phosphorus removal significantly increases daily waste solids quantities. A key advantage for chemical phosphorus removal compared to biological phosphorus removal is the chemical addition precipitates soluble phosphorus and the phosphorus remains in solid form for eventual removal through biosolids disposal. The rate of sludge production from chemical phosphorus removal is a function of phosphorus loading and subsequent chemical dosage for effective phosphorus precipitation and removal. Note that the sludge production rate could change significantly if influent phosphorus loadings change.

A rotary drum thickener, with chemical addition, will be used to increase solids content of the sludge from around 1% to 4.5% as described in the previous alternatives. The solids content needs to be increased in order to reduce the required digester and storage tank volumes. Filtrate water from the thickener is returned to the aeration basin control structure and thickened sludge is pumped to the aerobic digester.

The aerobic digester is a covered tank with coarse bubble diffusers for aerobic stabilization and mixing. The tank will have adequate volume for 60-day retention time at design AWW flow and load sludge production rates to comply with EPA part 503 rules for stabilizing biosolids. The digester will have decant piping and valves to draw-off clear supernatant and return the water to the aeration basins for treatment and discharge. As discussed in Alternative No. 1, biological phosphorus removal relies on PAOs to accumulate phosphorus and when the organisms die in the digester, the phosphorus is released back into the water. Phosphorus in chemical phosphorus removal remains tied-up in the chemical floc in the digester so decant water will not contain a concentrated portion of phosphorus. About 40% of the volatile solids in the digester are destroyed so the corresponding volume of water may be decanted off tank, resulting in a significant reduction in sludge storage volume required. As a result, even though Alternative No. 2 MLE process sludge production is about 22% greater than Alternative No. 1 UCT process, Alternative No. 2 requires nearly the same volume for aerobic digester. After digestion, biosolids are pumped to a press batch tank once or twice a week similar to Alternative No. 1.

Metal salt addition at the press batch tank will be reduced for Alternative No. 2 as compared to Alternative No. 1 because the phosphorus has already been tied up by chemical addition at the rapid mix tank. Alternative No. 2 will require about 30% more storage for dewatered cake as compared to Alternative No. 1 UCT process due to additional sludge production from chemical phosphorus removal. The city should monitor biosolids production related to chemical phosphorus removal. Additional biosolids storage capacity may be required if sludge production rates due to chemical phosphorus removal are greater than anticipated.

The city should plan to increase biosolids storage capacity in the future if industrial loads increase significantly from current levels. 365-day storage capacity for dewatered sludge at AWW design flow was included in this analysis. Once or twice per year, the stabilized biosolids would be loaded into trucks and hauled offsite for land application.

Chemical Phosphorus Removal – In order to satisfy Iowa Nutrient Reduction Strategy requirements, the proposed treatment facility would be equipped to perform chemical phosphorus removal with addition of metal salts to Control Structure No. 2

prior to the final clarifiers (see Figure 4.2). Ferric chloride and aluminum sulfate (alum) are the most common metal salts used to remove phosphorus from effluent wastewater. Alum would be used at the facility due to potential issues with chloride discharge limits compliance. When added to wastewater, both of these metal salts form inorganic coagulants that promote flocculation and subsequent adsorption of soluble phosphate. Phosphate is then settled out with the sludge flocs in the final clarifiers – effectively being removed from the treated effluent. The addition of metal salts has the ability to achieve TP effluent concentrations of <1.0 mg/L. Tertiary filters may be required if more stringent TP limits are imposed in the future.

Outfall Piping – Refer to Alternative No. 1 for discussion of outfall piping.

3. Alternative No. 3 – Oxidation Ditch

Alternative No. 3 is the construction of a new oxidation ditch treatment facility based on the Sanitaire Bioloop® process for biological nitrogen removal and chemical addition for phosphorus removal. Similar to Alternatives No. 1 & 2, the facility would be designed to achieve nutrient removal and treat 20-year projected AWW flows and loadings as specified in Section 2. The treatment plant would be continuous discharge to the Boone River at new Outfall 001. Figure 4.3 shows the proposed process flow diagram for this alternative.

Construction of the oxidation ditch treatment facility includes the following major process components:

- The following items are the same as Alternative No. 1, refer Alternative No. 1 for more information.
  - Renovate raw waste lift station at existing plant site.
  - Wet Weather Flow Equalization Lagoon.
  - Preliminary Treatment Building.
  - Operations Building.
- Oxidation ditch treatment train – Based on preliminary information provided by Electric Pump (Sanitaire). One train of two ditches in series with the ability to remove one ditch from service for maintenance or repairs.
  - Anaerobic tank
    - One (1) tank at 464,000 gallons total capacity
    - 18-foot side water depth
    - Submersible mixers
  - Pre-anoxic tank
    - One (1) tank at 156,000 gallons total capacity
    - 18-foot side water depth
    - Submersible mixers
  - Oxidation ditch control structure
    - Typical operation is one (1) train of two (2) oxidation ditches series

        - Provides ability to step feed pre-anoxic effluent to either ditch or to completely bypass flow around one ditch for maintenance or repairs.
        - Magnesium hydroxide feed location (if required due to alkalinity constraints)
    - Oxidation ditches
        - Two (2) tanks at 2.26 MG each for 4.52 MG total capacity
        - 18-foot side water depth
        - Fine bubble diffused aeration grids in aerobic zones
        - Anoxic zones provided in ditch for nitrogen removal.
        - Submersible mixers
        - Mixed liquor return accomplished by current from submersible mixers.
        - Baffle wall tank
- The following items are the same as Alternative No. 1, refer Alternative No. 1 for more information.
    - Rapid mix tank
        - Only method for enhanced phosphorus removal for this process.
        - Mechanical mixer
        - Chemical addition for phosphorous removal
        - Polymer addition
    - Clarifier control structure
    - Three (3) final clarifiers
        - 78-foot diameter – Larger diameter required due to increased mixed liquor concentration compared to Alternative No. 1. RAS rate of 150% assumed because redundancy is not provided for nutrient removal basins.
    - UV disinfection
    - Magnetic flow meter or Parshall flume for effluent flow monitoring
    - Reaeration basin
    - Discharge at proposed Outfall 001
    - RDT Holding Tank
        - One (1) tank at 315,000 gallon capacity located ahead of rotary drum thickener.
        -

- Rotary Drum Thickener
  - Waste Activated Sludge (WAS) Thickening from less than 1% to 4.5%
  - 350 GPM at 0.78% solids
- Aerobic Digester
  - Two (2) tanks at 442,00 gallons each for 884,000 gallons total capacity.
    - 60-days retention time and 15 deg. C at 4.5% TS at AWW design load (EPA Appendix B to Part 503)
  - 60-foot diameter
  - 22-foot side water depth.
  - Coarse bubble aeration for mixing and oxygen transfer
  - Press Holding Tank
    - 116,000 gallons for one week storage to provide consistent feed stock to sludge press
  - Press Building
  - Cake Storage Building
    - Approximate building dimensions 130-feet x 240-feet x 10-feet stacking height.

A detailed design summary and process description provided by Sanitaire is included in Appendix J.

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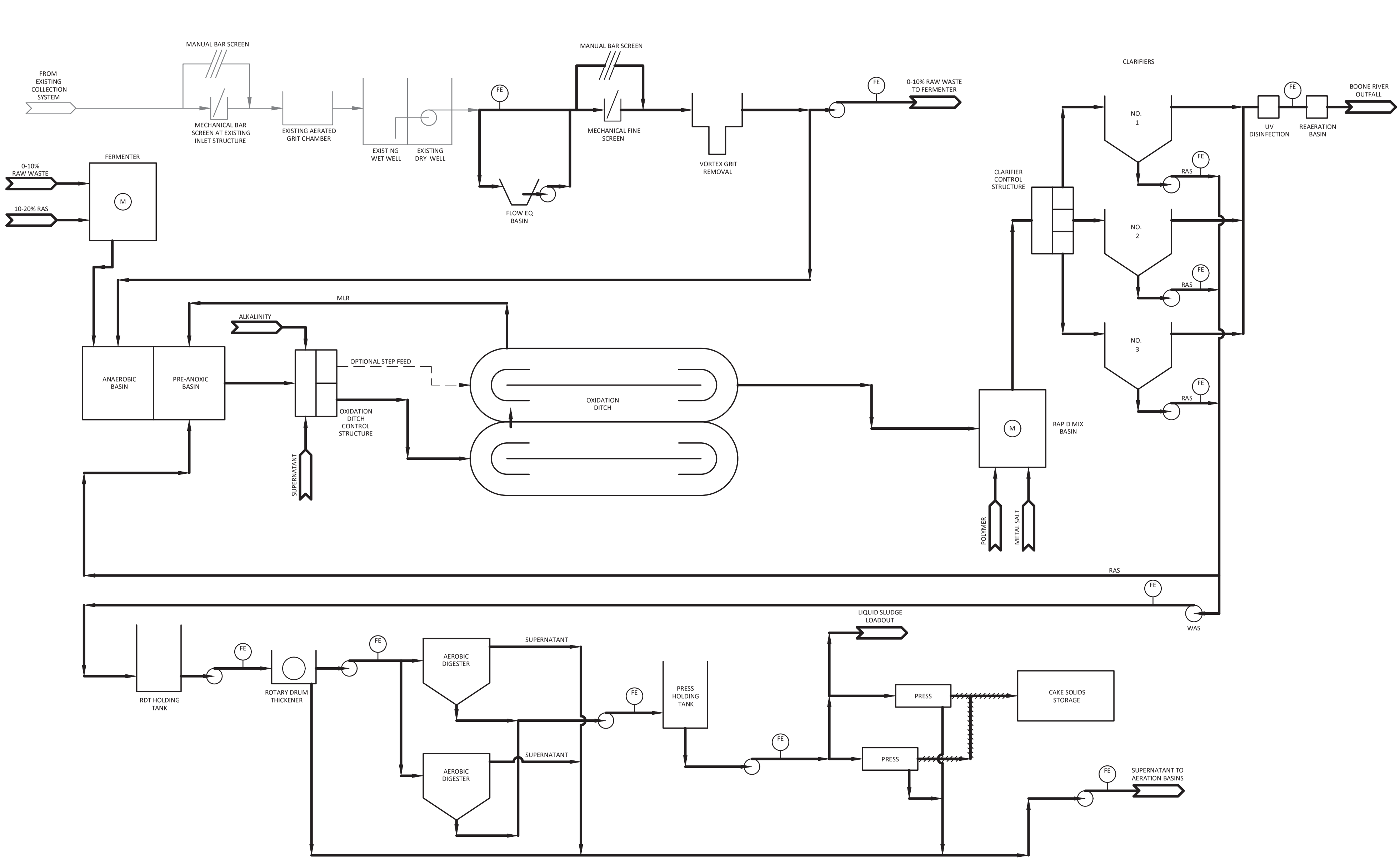

Figure 4.3
WEBSTER CITY, IOWA
WASTEWATER FACILITY PLAN
ALTERNATE NO. 3 - OXIDATION DITCH

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E. Financial Considerations

1. General

Published and unpublished data on costs for similar types of construction projects were used to prepare the opinion of costs presented herein. Annual inflation rates for this type of construction have ranged from approximately 5 to 40 percent in recent years, with higher inflation rates since the end of 2020. The cost opinions presented herein are intended for use as guidelines in the decision making process. The accuracy of these cost opinions should be considered within +/-30% of the actual project costs. Once preparation of final drawings and specifications is underway, the cost opinions would be refined.

2. Capital Cost Opinion

The opinion of probable cost for the Alternatives is presented in Table 4.2. Preliminary cost for engineering, construction oversight, administration, and legal are included. Cost opinion details are included in Appendix I.

Table 4.2: Webster City Facility Plan Opinion of Probable Cost for WWTF Improvements

Ite	Altern tive No. 1 – UCT	Altern tive No. 2 – M E	Altern tive No. 3 – Ox. Ditch
General Conditions (3-5% of Construction Subtotal)	$2,700,000	$2,700,000	$3,000,000
East ift Station Renovation	$610,000	$610,000	$610,000
Forcemain	$3, 80,000	$3, 80,000	$3, 80,000
Wet Weather Storage Lagoon	$900,000	$900,000	$900,000
Site Wor	$3,900,000	$3,900,000	$4,300,000
Cast in Place Concrete	$12,7 5,000	$12,5 5,000	$15,310,000
Buildings - Precast Concrete	$1,720,000	$1,785,000	$1,815,000
Architectural (Roofs, Carpentry, Doors, Misc. Metal	$1,520,000	$1,540,000	$1,540,000
Pre-Engineered Metal Building - Dewatered Sludge Storage	$4 5,000	$600,000	$700,000
Painting	$800,000	$800,000	$780,000
Equipment	$7,2 0,000	$7,345,000	$7,390,000
Equipment Installation	$1,4 0,000	$1,470,000	$1,480,000
Piping, Fittings and Installation	$7,500,000	$7,350,000	$7,000,000
Valves and Gates	$1,200,000	$1,150,000	$1,000,000
Outfall Piping and Protection	$250,000	$250,000	$250,000
Plumbing	$500,000	$700,000	$500,000
HVAC	$1,000,000	$1,100,000	$1,100,000
Electrical & Controls	$7, 00,000	$7,500,000	$7,200,000
Construction Contract Allowances	$1,000,000	$1,000,000	$1,000,000
Subtotal	, ,	, ,	, ,
Contingency (20%)	$11,3 6,000	$11,318,000	$11,700,000
Con truction Subtotal	, ,	, ,	, ,
Legal/Engineering/Financing/Administration (15%)	$10,230,000	$10,187,000	$10, 00,000
TOTAL	, ,	, ,	, ,

3. Cost Evaluation

Cost differences between Alternative 1 and 2 nearly offset each other for a total project cost that are very similar. Alternative 3 has a higher project cost due to increased tank sizes for the oxidation ditches, greater return activated sludge flowrate required and greater waste sludge production rate. The cost difference between Alternatives 1, 2 and Alternative 3 is approximately $2.4 million.

For Alternative 1, biosolids production rates and storage requirements would be monitored and expanded if in the future if conditions require additional capacity.

4. Operations, Maintenance, and Replacements Costs (OM&R)

Operation and maintenance costs can have a significant effect on the overall cost of wastewater treatment. Major components of the O&M costs include employee salaries and benefits, administration, chemicals, utilities, and other non-capital related expenditures. Additional cash reserves must also be budgeted for short-lived assets that require replacement within a 15 year time frame. Short-lived assets may include pumps, chemical feed equipment, and other equipment that may require replacement within the design life of the system. A breakdown of estimated short-lived asset reserve costs for each alternative is presented in Table 4.3.

Table 4.3: Short-Lived Asset Reserve							
Item	Useful Life	Alternative No. 1		Alternative No. 2		Alternative No. 3	
		Total	Annual	Total	Annual	Total	Annual
Lift Station							
Pump Rebuild	15	$300,000	$20,000	$300,000	$20,000	$300,000	$20,000
Pretreatment System							
Screen Rebuild	15	$50,000	$3,333	$50,000	$3,333	$50,000	$3,333
Grit Removal Rebuild	15	$30,000	$2,000	$30,000	$2,000	$30,000	$2,000
Biological Treatment							
Air Diffusers Replacement	5	$50,000	$10,000	$50,000	$10,000	$25,000	$5,000
Submersible Pumps Rebuild	15	$300,000	$20,000	$250,000	$16,667	$50,000	$3,333
Submersible Mixers Replacement	5	$20,000	$4,000	$0	$0	$100,000	$20,000
Aeration Blowers Rebuild	15	$200,000	$13,333	$200,000	$13,333	$200,000	$13,333
Sludge Process							
RAS Pumps Rebuild	15	$100,000	$6,667	$125,000	$8,333	$125,000	$8,333
WAS Pump Rebuild	15	$10,000	$667	$10,000	$667	$10,000	$667
Scum Pump Rebuild	15	$10,000	$667	$10,000	$667	$10,000	$667
Sludge Pumps Rebuild	15	$100,000	$6,667	$125,000	$8,333	$125,000	$8,333
RDT Rebuild	15	$30,000	$2,000	$35,000	$2,333	$35,000	$2,333
Sludge Press Rebuild	15	$150,000	$10,000	$200,000	$13,333	$200,000	$13,333
Conveyors Rebuild	10	$100,000	$10,000	$120,000	$12,000	$120,000	$12,000
Digester Blowers Rebuild	15	$150,000	$10,000	$200,000	$13,333	$250,000	$16,667
Chemical Feed System							
Metal Salt Replacement	15	$75,000	$5,000	$150,000	$10,000	$125,000	$8,333
Miscellaneous							
Samplers	15	$30,000	$2,000	$25,000	$1,667	$25,000	$1,667
HVAC Rebuild/Replacement	10	$300,000	$30,000	$300,000	$30,000	$300,000	$30,000
Total Annual Budgeted Cost			**$156,333**		**$166,000**		**$169,333**

The incremental costs are the increases in annual costs from the City's current FY 2023-2024 budget. Incremental OM&R costs for each alternative are presented in Table 4.4. The greatest difference between the alternatives is the chemical costs associated with phosphorus removal required for Alternative No. 2.

Table 4.4: Incremental Annual OM&R Costs Over Current Plant Budget Costs			
Item	**Alt. No. 1**	**Alt. No. 2**	**Alt. No. 3**
Salaries & Benefits	$79,000	$79,000	$79,000
Utilities	$188,000	$184,000	$178,000
Chemicals, Supplies & Misc.	$59,000	$181,000	$144,000
Maintenance & Replacement	$56,000	$54,000	$50,000
Total OM&R Increase	$381,000	$498,000	$451,000

5. Annual Project Costs

Determination of annual project costs is a useful measure to compare multiple alternatives on a financial basis. Annual project cost is the sum of the anticipated OM&R cost and the annualized capital costs. Annualized capital costs represent the yearly sum of money needed to finance a capital expenditure over a specified period and interest rate (i.e. capital recovery).

The City is considering alternative sources of debt financing. The evaluation is based on a USDA RD loan (40 years, 2.63% interest) as suggested to the City by PFM, public financial advisors. Table 4.5 is a summary of the projected annual costs for the wastewater treatment facility and collection system. The projected operating costs are based on the City's FY 2023-2024 budget and adjusted for increased costs associated with the purposed wastewater treatment facility.

Table 4.5: Wastewater Collection and Treatment Annual Expenses (Based on Alt. 1 – UCT Process)	
Item	**Value**
Wastewater Treatment Plant	
Labor plus Fringe Benefits	508,000
Power	369,000
Chemicals	210,000
Other Expenses	174,000
Total Plant O&M Expenses	$1,261,000
Collection System O&M	248,000
City Department Support Services	342,000
Franchise Fee – Transfer Out	114,000
Total Operating Expenses	$1,965,000
Capital and Maintenance Payments	535,000
Debt Service[1, 2, 3]	$3,592,000
Total Annual OM&R, Capital Projects, and Debt Services	$6,092,000

Note:

1. Debt service cost is based on $79.85 million principal, 2.63%, 40-year term USDA loan
2. Debt service cost includes $365,000 per year short-lived assets and debt service reserve fund cash requirements for first ten years of the loan (as required by USDA)
3. Debt service costs were developed by PFM, public financial advisors

6. Impact to ser Costs

The capital costs associated with constructing a new treatment facility will have a significant impact on the annual wastewater treatment operating budget as indicated in Table .5. The current FY 2021- FY 2022 sewer user revenue was $1,924,000, significantly less than the $6,092,000 projected annual costs indicated in Table 4.5.

The City is evaluating alternative financing terms and sewer user rate structures. The City recently implemented an $11 per month capital surcharge for all sewer users and a 2% increase in sewer user rates. A preliminary evaluation by PFM, public finance advisors, indicates the following monthly sewer user bills for a 4,500 gallons per month user:

Current: $63 per month

Projected: $149 per month

The projected rates are very high. The City and its financial advisors are evaluating potential sources of grants including a Community Development Block Grant, and USDA Rural Development grants.

The user rate structures, including industrial user rates and surcharge rates will be developed as the financing details are evaluated.

F. Summary of Advantages and Disadvantages

1. Alternative No. 1 – Extended Aeration CT Process

a Advantages

- Less e pensive treatment alternative than Alternatives 2 and 3 for capital and OM&R expenses.
- Extended aeration activated sludge process is a robust treatment technology for achieving low ammonia discharge limits.
- Designed for biological phosphorus removal which reduces tank size requirements for aeration basins, aerobic digester, and biosolids storage as compared to Alternatives 2 and 3. (Chemical addition provided as temporary backup).
- Provides high level of operator control.
- Design provides redundancy in the treatment process and allows for flexibility for future expansion.

b) Disadvantages

- Biological phosphorus removal can have variable results depending on flows, loadings, and wastewater characteristics. However, it is important to note that chemical phosphorus removal is included as a temporary backup option to the biological process for Alternative 1.
- Alternative 1 requires an additional recycle pump and piping for anoxic liquor return.
- Some chemical addition will li ely be required to capture soluble phosphorus in the biosolids process due to phosphorus release by the PAOs in an anaerobic environment.

2. Alternative No. 2 – Extended Aeration MLE Process

a) Advantages

- Chemical phosphorus removal is a robust process that is not dependent on biological activity. Biological phosphorus removal can be upset by temperature, influent loading fluctuations, toxicity, etc.
- Extended aeration activated sludge process is a robust treatment technology for achieving low ammonia discharge limits
- Reduced number of return pumps and control structures required compared to Alternative 1.

b) Disadvantages

- Higher capital and OM&R costs than Alternative 1.
- Increased aeration basin size required to maintain to mixed liquor concentration of less than 5,000 mg/L due to solids produced from chemical phosphorus removal.
- Increased digester and biosolids storage capacity required due to solids generated from chemical phosphorus removal.

3. Alternative No. 3 – Oxidation Ditch

a) Advantages

- Reduced amount of fine bubble aeration equipment required.
- Submersible mixers typically require less energy than jet mix systems.
- High recirculation rates possible due to race track flow path which allows many passes through aerobic and anoxic zones for nitrification and denitrification.
- Reduced number of pumps required for internal recirculation streams.

b) Disadvantages

- Higher capital and OM&R costs than Alternative 1 and 2.
- Vendor design results in a large package of equipment and limits the number equipment suppliers able to bid project.
- No flow meters provided internal recirculation streams.
- Reduced operator process control compared to Alternatives 1 and 2.
- Increased basin sizes compared to Alternative 1 and 2 (per vendor preliminary design).
- Increased digester and biosolids storage capacity required due to solids generated from chemical phosphorus removal.

V. RE OMME DATIONS AND FINANCING OPTIONS

A. General

Previous sections of this report evaluated three main alternatives for wastewater system improvements for the City of Webster City. This section will review these main alternatives and provide a recommendation for wastewater system improvements based on both quantitative and qualitative factors, including financial considerations, reliability, expandability, and operation and maintenance considerations. Financing options and a proposed implementation schedule are also discussed.

B. Decision Matri

Table 5.1 presents a decision matri for the three wastewater system improvement alternatives discussed in Section 4. The criteria considered in the decision matrix are based on both monetary and non-monetary factors.

Table 5.1: Decision M trix			
Ite	**Alt. No. 1**	**Alt. No. 2**	**Alt. No. 3**
Land Requirement	20 acres	20 acres	20 acres
Overall Ability to meet Improvements Needs	Excellent	Excellent	Good
Expandability Potential	Excellent	Excellent	Good
Ability to meet *Current* Discharge Limits	Excellent	Excellent	Good
Ability to meet *Future* Discharge Limits	Excellent	Excellent	Average
Estimated Capital Costs	$78,426,000	$78,450,000	$80,855,000
Estimated Change OM&R Costs	$381,000	$49 ,000	$451,000

Both alternatives 1 and 2 would work well for meeting the future treatment needs of Webster City. Alternative No. 3 has lower ratings due to reduced operator control over the process, reduced redundancy, and higher capital cost.

C. Recommended Alternative

The recommended alternative for wastewater treatment system improvements is Alternative No. 1 – Extended Aeration CT Process. This alternative was found to be the most cost-effective solution to meet all improvement needs and to achieve current and future discharge limits.

Key highlights and advantages of the recommended alternative are as follows:

- Extended aeration activated sludge is a widely-used and reliable treatment technology for achieving low ammonia discharge limits
- Treatment process provides operator with greater control of treatment performance compared to other systems such as oxidation ditch and SBR
- No premium costs associated with building a facility with a small footprint, treatment process is well-tailored to the needs of Webster City
- Ability to achieve TN and TP removal goals as set forth by the Iowa Nutrient Reduction Strategy
- Designed to allow for expansion to handle flows and loadings beyond 20-year design period or accommodate new industrial loads in the future
- UV disinfection eliminates chemical costs, potential hazards associated with chlorine

gas storage, and discharge limits for total residual chlorine

An overall preliminary location plan for proposed improvements is presented in Figure 5.1. A preliminary site plan of the proposed improvements relative to the existing facility is presented in Figure 5.2. A preliminary site plan for the proposed facility is presented in Figure 5.3. The site arrangement utilizes land previously acquired by the City on the south side of town. DNR Schedule F Treatment Project Site Selection was submitted for review July 2022. The new treatment facility would be constructed while the existing facility remained in service. Improvements at the existing main lift station would be completed in phases to allow continuous operation of the facility. After the new activated sludge facility is online, the existing treatment facility except for the main lift station and control building would be demolished.

The City is in negotiations with the landowner along the forcemain route for easement. The City has purchased a lot on the corner of Oakwood Drive and Bicentenial Court for use in routing the forcemain through this area. A recent study of the City's power grid recommended decommissioning the Passwaters Substation on Oakwood Drive. The City has entered into an agreement with a consultant to design a new substation on the south side of Highway 20 that will replace Passwaters in 2024. Plan to use the Passwaters Substation lot as a bore pit for the wastewater forcemains crossing Highway 20.

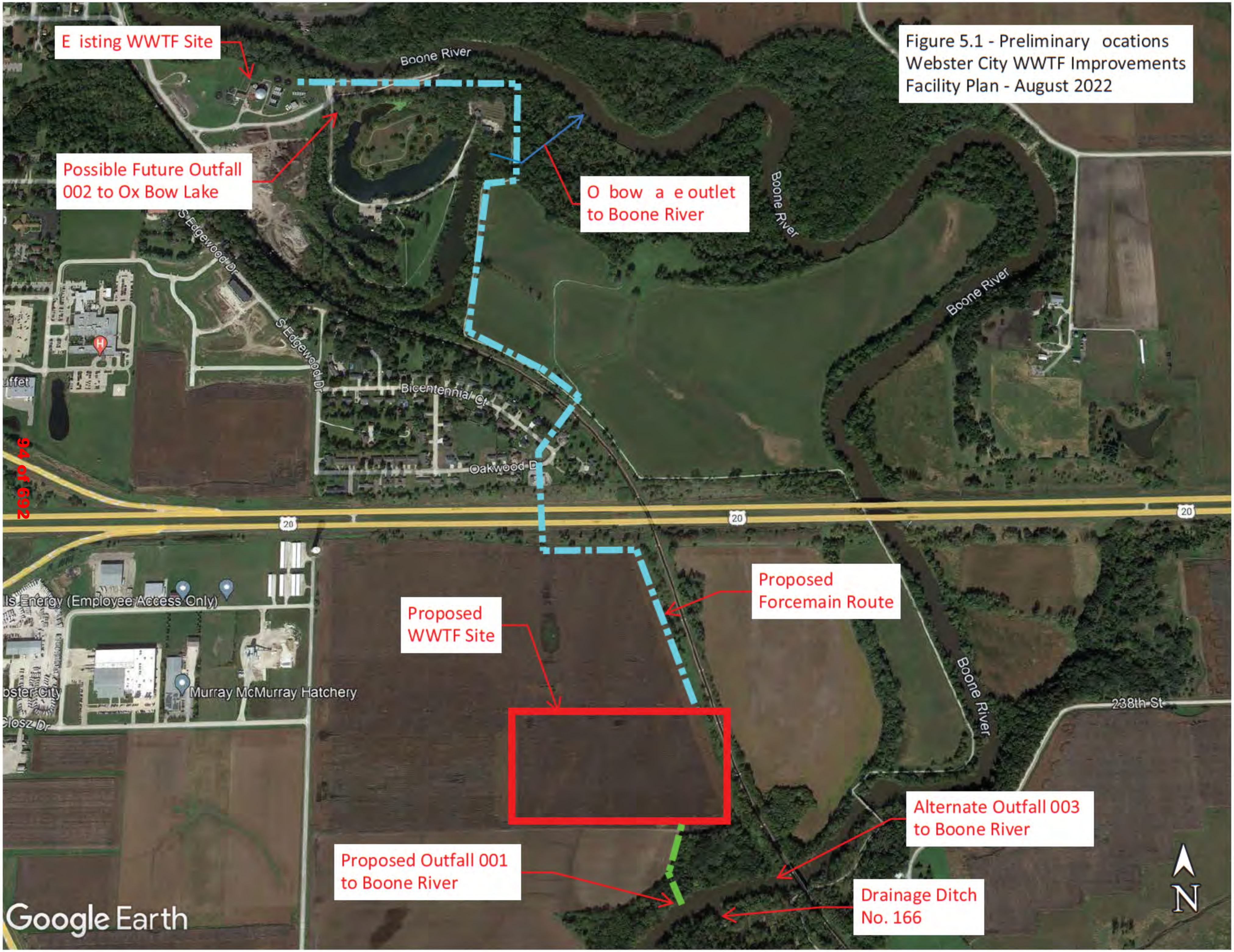
Figure 5.1 - Preliminary ocations
Webster City WWTF Improvements
Facility Plan - August 2022
E isting WWTF Site
Possible Future Outfall 002 to Ox Bow Lake
O bow a e outlet to Boone River
Boone River
S Edgewood Dr
Bicentennial Ct
Oakwood Dr
20
Proposed WWTF Site
Proposed Forcemain Route
Proposed Outfall 001 to Boone River
Alternate Outfall 003 to Boone River
Drainage Ditch No. 166
238th St
Murray McMurray Hatchery
(Employee Access Only)
N
Google Earth

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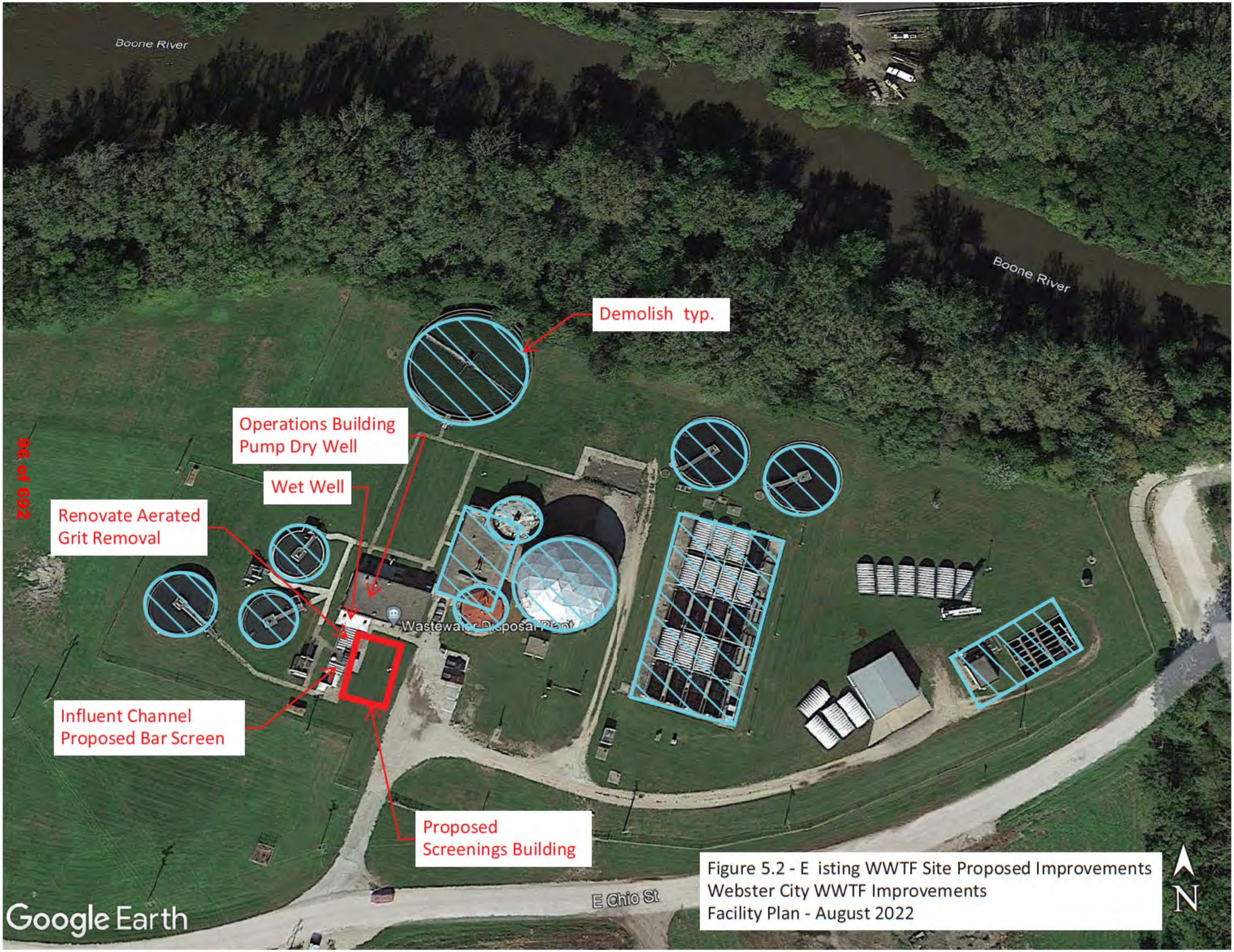

Figure 5.2 - E isting WWTF Site Proposed Improvements
Webster City WWTF Improvements
Facility Plan - August 2022

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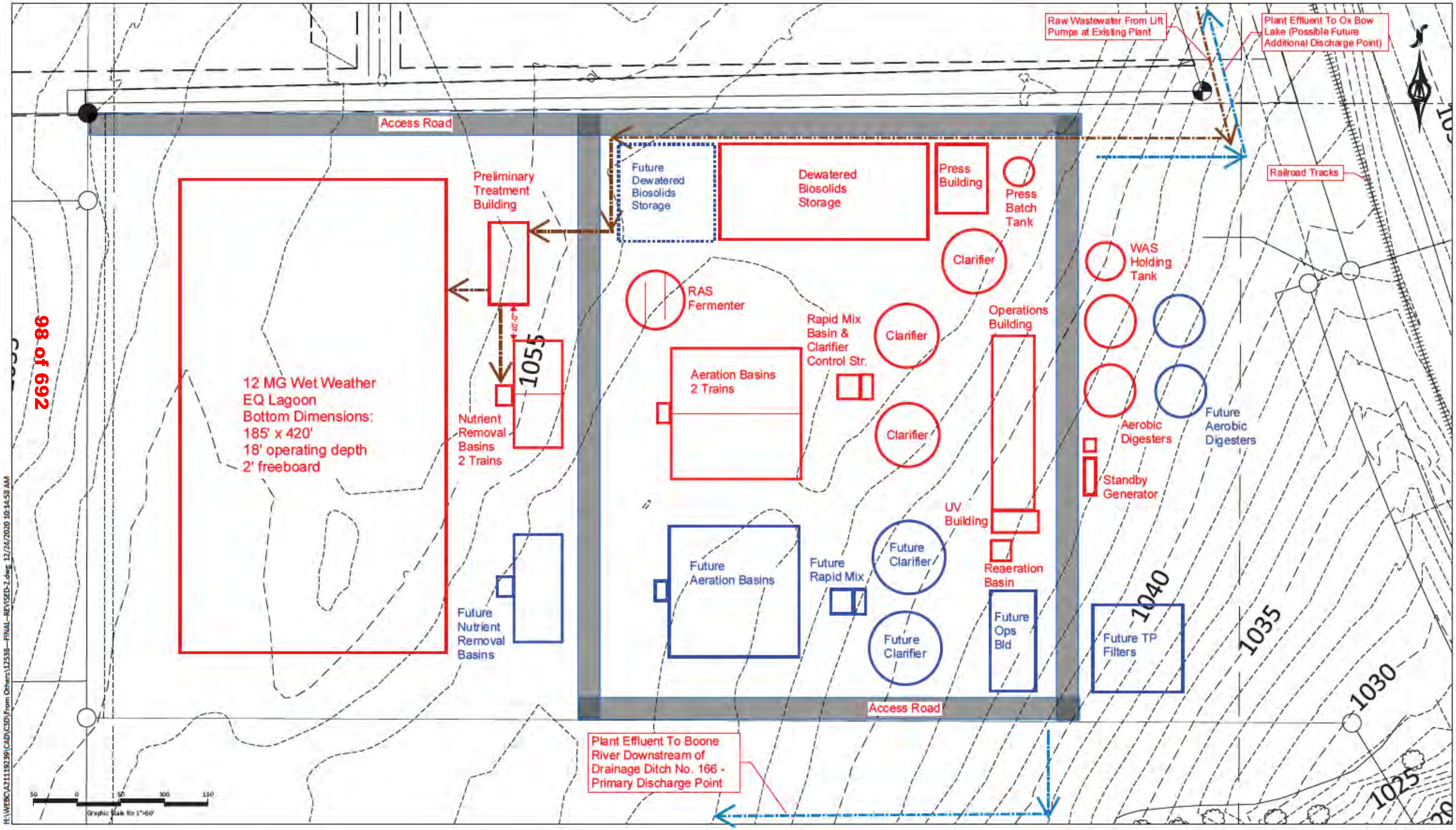
Figure 5.3 - Proposed WWTF Site Plan

August 2022



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D. Financing Options

There are several funding options the City of Webster City can e plore to help finance these improvements. It is recommended that the City work with their financial advisor to determine the best financing package available. Below is a listing of some of the options.

1. Bonding

   The City could sell general obligation, local improvement, or revenue bonds in order to raise the capital costs to improve the treatment facility. The proceeds of the bonds would need to be repaid, either through property taxes, assessments, or user charges to the system.

2. Assessment

   A portion of the capital costs of the project can be assessed to local property owners under Iowa Code Section 384.7, or taxes may be levied to establish a debt service fund under Iowa Code Section 384.4. These funds could help offset some monthly increases in user fees and permit use of general obligation bonding.

3. Rural Development Loans

   The City may be eligible to secure a loan or grant through the USDA Office of Rural Development to help finance wastewater system improvements. Repayment could be through an increase in local property tax rates, user fees, or assessments. A portion of the project costs may be eligible for grant funding as a part of this program depending on the economic status of the residents in the City.

   In order to be considered for Rural Development monies, a Preliminary Engineering Report (PER) and Environmental Report (ER) must be completed and submitted to RD for their review and approval. Upon approval, RD would allocate a low-interest fixed-rate loan and/or grant used to help finance the project. Current loan terms up to 40 years are available. Depending on economic status, grants are available for up to 75% of the project cost.

   Rural Development uses an Equivalent Dwelling Unit (EDU) calculation for assisting in determining the amount and type of funding for which a community is eligible. The preliminary EDU calculations for the City of Webster City indicate that the project may not be eligible for grant funding, due to the large percentage of design capacity allocated to industrial users but loan financing would still be available based on the median household income (MHI) of the residents in Webster City. Although a 40-year loan term is favorable from an annual cost basis, wastewater facilities typically require a significant upgrade after 20 years. Since the life expectancy of the facility is shorter than the loan term, it is generally not advisable to consider paying for wastewater treatment facilities with this method (i.e. the City would be in perpetual debt .

4. Clean Water State Revolving Fund (SRF) (through IFA & IDNR)

   The loan program was created under the Clean Water State Revolving Fund CWSRF) provisions in the Federal Clean Water Act to provide financial assistance for water pollution control projects. Iowa s revolving loan program provides loans to municipalities for planning, design, and construction of wastewater treatment projects. The IDNR administers the environmental and permitting aspects to prepare projects for financing, while the Iowa Finance Authority (IFA) provides loan approvals and disbursements. To be eligible for funding, the City must submit this facility plan to the IDNR for approval and complete an Intended Use Plan (IUP) application to request inclusion on the IUP list. Once an applicant is on the list, they are eligible to apply for a SRF loan.

The standard loan terms for all applicants is a 20 year loan period at an interest rate of 2%. SRF also offers extended loan terms of 30 years at 3% interest (disadvantaged and non-disadvantaged applicant). Applicants must be determined to be disadvantaged based on criteria in Iowa Code Section 455B.199B, Disadvantaged Communities Variance, as amended by Senate File 407 on April 28, 2011. Determining factors include MHI, annual water and sewer rates as percentage of MHI, number of families below poverty level, per capita outstanding debt as percentage of MHI, and cost effectiveness of the project. The Iowa Finance Authority utilizes these criteria to determine qualifying interest rates. Terms for disadvantaged qualification are currently under review. It is unknown at this time if Webster City would qualify as disadvantaged. SRF also has a Sponsored Project program. The Sponsored Projects program is a competitive application program that has been implemented through the Clean Water State Revolving Fund (CWSRF), a loan program for construction of water quality facilities and practices. On a typical CWSRF loan, the utility borrows principal and repays principal plus interest and fees. On a CWSRF loan with a sponsored project, the utility borrows for both the wastewater improvement project and the sponsored project; however, through an overall interest rate reduction, the utility's rate payers do not pay any more than they would have for just the wastewater improvements. Instead, two water quality projects are completed for the cost of one. The project is a "water resource restoration" project, typically associated with improving storm water quality in the watershed of the wastewater treatment facility. DNR temporarily suspended Sponsored Project applications in 2022. It is anticipated that the application process will start up again in 2023 or 2024, possibly with revised terms and conditions.

5. Community Development Block Grants (CDBG)

The Community Development Block Grant (CDBG) Program is administered through the Iowa Economic Development Authority in order to provide federal grants from the U.S. Department of Housing and Urban Development (HUD) to local units of government on a competitive basis for a variety of community development projects. Eligible applicants include cities and townships with populations under 50,000 and all counties.

In order to be eligible for grant funding, the proposed project must meet one of the three national objectives:

- A minimum of 51% of those benefitting from the proposed project must be considered low or medium income (LMI) in accordance with the U.S. Department of Housing and Urban Development (HUD). A survey of at least 300 households must be completed in order to make this assessment.
- Help eliminate slum and blight conditions
- Help eliminate urgent threats to public health or safety

In addition, the proposed project activities must be eligible for funding, project needs must be documented, and the general public must be involved in the application preparation.

Under this program, Community Development Block grants are available for wastewater treatment projects, including collection systems and treatment plans;

fresh water projects, including wells, water towers, and distribution systems; storm sewer projects; flood control projects; and occasionally street projects. The amount of grant monies allocated is dependent on the availability of other sources of financing.

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VI. CONCLUSIONS AND RECOMMENDATIONS

A. General

Recommended wastewater system improvements for the City of Webster City include renovation of the existing main lift station and construction of an extended aeration activated sludge treatment facility with biological nitrogen and phosphorus removal (UCT Process) at design loadings outlined in Section II (Alternative 1). Details for these proposed improvements are discussed thoroughly in Sections IV and V of this Facility Plan.

The proposed improvements will provide a robust and proven treatment technology for meeting ammonia discharge limits, and will also comply with the Iowa Nutrient Reduction Strategy guidelines for TN and TP removal. Proposed improvements will provide enhanced operational control and performance over the existing fixed film system. The extended aeration activated sludge with biological nitrogen and phosphorus removal process is feasible and can be completed by traditional construction methods.

After submittal of this Facility Plan to the Iowa Department of Natural Resources (IDNR), the City should move forward with preparation of construction plans and specifications in order to maintain schedule and meet nutrient reduction goals. The City will submit a request for NPDES amendment to the nutrient reduction construction schedule after the project schedule is finalized. The City must also evaluate available funding options as discussed in Section V.D of this report. Depending on which funding option is selected, Bolton & Menk will work with the City's financial advisor and bond council in securing these funds. Table 6.1 is a preliminary schedule for design and construction of improvements:

Table 6.1: Preliminary Project Implementation Schedule

Item	Date
Submit Facility Plan & IUP Application	September 2022
Project Placed on IUP List	December 2022
DNR Approve Facility Plan	January 2023
Submit Construction Permit Application	June 2023
Receive Bids	September 2023
DNR Issue Construction Permit	September 2023
Start Construction	October 2023
Complete Construction	October 2025*

Note:
*current completion date for Nutrient Reduction Construction Schedule per NPDES Permit is March 1, 2024. The City will submit a request for NPDES amendment to the nutrient reduction construction schedule after the project schedule is finalized.

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Appendix A: NPDES Discharge Permit

September 7, 2021

TIM DANIELSON, WASTEWATER SUPERINTENDENT
CITY OF WEBSTER CITY
PO BOX 217
WEBSTER CITY, IA 50595-0217

RE: NPDES Final Permit #4063001

Dear Mr. Danielson:

Enclosed is the final NPDES permit that authorizes the discharge of wastewater from the City of Webster City's wastewater treatment facility. This final permit is the same as the draft permit sent on July 21, 2021. The issuance date of this permit is October 1, 2021; please become familiar with all limits and requirements in the enclosed final permit.

The facility will be required to use new discharge monitoring report (DMR) forms once a final permit is issued. Electronic DMR forms are available from your regional Field Office. Please contact Jacob Donaghy at 641-424-4073 (Field Office 2) or jacob.donaghy@dnr.iowa.gov for more information.

If you have any questions, please contact me at 515-725-1235 or at ryan.olive@dnr.iowa.gov.

Sincerely,

Ryan Olive Digitally signed by Ryan Olive Date: 2021.09.07 13:35:41 -05'00'

Ryan Olive
NPDES Section

Enclosures

IOWA DEPARTMENT OF NATURAL RESOURCES

National Pollutant Discharge Elimination System (NPDES) Permit

OWNER NAME & ADDRESS

CITY OF WEBSTER CITY
P.O. BOX 217
WEBSTER CITY, IA 50595-0217

FACILITY NAME & ADDRESS

WEBSTER CITY, CITY OF STP
101 EAST OHIO STREET
WEBSTER CITY, IA 50595-0217

Section 6, T88N, R25W
Hamilton County

IOWA NPDES PERMIT NUMBER: 4063001
DATE OF ISSUANCE: 10/01/2021
DATE OF EXPIRATION: 09/30/2026

YOU ARE REQUIRED TO FILE FOR RENEWAL OF THIS PERMIT BY: 04/03/2026
EPA NUMBER: IA0036625

This permit is issued pursuant to the authority of section 402(b) of the Clean Water Act (33 U.S.C. 1342(b)), Iowa Code section 455B.174, and rule 567-64.3, Iowa Administrative Code. You are authorized to operate the disposal system and to discharge the pollutants specified in this permit in accordance with the effluent limitations, monitoring requirements and other terms set forth in this permit.

You may appeal any condition of this permit by filing a written notice of appeal and request for administrative hearing with the director of the department within 30 days of permit issuance.

Any existing, unexpired Iowa operation permit or Iowa NPDES permit previously issued by the department for the facility identified above is revoked by the issuance of this permit. This provision does not apply to any authorization to discharge under the terms and conditions of a general permit issued by the department or to any permit issued exclusively for the discharge of stormwater.

FOR THE DEPARTMENT OF NATURAL RESOURCES

By Ryan Olive Digitally signed by Ryan Olive Date: 2021.09.07 13:34:08 -05'00'

Ryan Olive
NPDES Section, Environmental Services Division

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

Outfall No.: 001 DISCHARGE FROM TRICKLING FILTER/ROTATING BIOLOGICAL CONTACTOR WASTEWATER TREATMENT FACILITY

Receiving Stream: UNNAMED CREEK

Route of Flow: UNNAMED CREEK TO AN OXBOW LAKE

Class A2 waters are secondary contact recreational use waters in which recreational or other uses may result in contact with the water that is either incidental or accidental. During the recreational use, the probability of ingesting appreciable quantities of water is minimal. Class A2 uses include fishing, commercial and recreational boating, any limited contact incidental to shoreline activities and activities in which users do not swim or float in the water body while on a boating activity.

Waters designated Class B(WW2) are those in which flow or other physical characteristics are capable of supporting a resident aquatic community that includes a variety of native nongame fish and invertebrate species. The flow and other physical characteristics limit the maintenance of warm water game fish populations. These waters generally consist of small perennially flowing streams.

Outfall No.: 003 DISCHARGE FROM TRICKLING FILTER/ROTATING BIOLOGICAL CONTACTOR WASTEWATER TREATMENT FACILITY

Receiving Stream: BOONE RIVER

Route of Flow: BOONE RIVER

Class A1 waters are primary contact recreational use waters in which recreational or other uses may result in prolonged and direct contact with the water, involving considerable risks of ingesting water in quantities sufficient to pose a health hazard. Such activities would include, but not be limited to, swimming, diving, water skiing, and water contact recreational canoeing.

Waters designated Class B(WW1) are those in which temperature, flow and other habitat characteristics are suitable to maintain warm water game fish populations along with a resident aquatic community that includes a variety of native nongame fish and invertebrates species. These waters generally include border rivers, large interior rivers, and the lower segments of medium-size tributary streams.

Waters designated Class HH are those in which fish are routinely harvested for human consumption or waters both designated as a drinking water supply and in which fish are routinely harvested for human consumption.

Bypasses from any portion of a treatment facility or from a sanitary sewer collection system designed to carry only sewage are prohibited.

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

Effluent Limitations:

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

001 DISCHARGE FROM TRICKLING FILTER/ROTATING BIOLOGICAL CONTACTOR WASTEWATER TREATMENT FACILITY

Outfall: 001 Effective Dates: 10/01/2021 to 09/30/2026				
Parameter	**Season**	**Limit Type**	**Limits**	
CBOD5			**85% Removal Required**	
	Yearly	7 Day Average	40 MG/L	1,101 LBS/DAY
	Yearly	30 Day Average	25 MG/L	688 LBS/DAY
TOTAL SUSPENDED SOLIDS			**85% Removal Required**	
	Yearly	7 Day Average	45 MG/L	1,238 LBS/DAY
	Yearly	30 Day Average	30 MG/L	826 LBS/DAY
AMMONIA NITROGEN (N)				
	JAN	30 Day Average	3.4 MG/L	94 LBS/DAY
	JAN	Daily Maximum	15.2 MG/L	418 LBS/DAY
	FEB	30 Day Average	4.0 MG/L	109 LBS/DAY
	FEB	Daily Maximum	14.2 MG/L	391 LBS/DAY
	MAR	30 Day Average	3.4 MG/L	94 LBS/DAY
	MAR	Daily Maximum	14.7 MG/L	404 LBS/DAY
	APR	30 Day Average	1.5 MG/L	42 LBS/DAY
	APR	Daily Maximum	15.7 MG/L	432 LBS/DAY
	MAY	30 Day Average	1.7 MG/L	48 LBS/DAY
	MAY	Daily Maximum	15.2 MG/L	418 LBS/DAY
	JUN	30 Day Average	1.3 MG/L	36 LBS/DAY

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

Outfall: 001 Effective Dates: 10/01/2021 to 09/30/2026			
Parameter	**Season**	**Limit Type**	**Limits**
AMMONIA NITROGEN (N)			
	JUN	Daily Maximum	14.4 MG/L 397 LBS/DAY
	JUL	30 Day Average	1.0 MG/L 28 LBS/DAY
	JUL	Daily Maximum	17.6 MG/L 484 LBS/DAY
	AUG	30 Day Average	1.0 MG/L 26 LBS/DAY
	AUG	Daily Maximum	16.2 MG/L 447 LBS/DAY
	SEP	30 Day Average	1.1 MG/L 29 LBS/DAY
	SEP	Daily Maximum	16.5 MG/L 454 LBS/DAY
	OCT	30 Day Average	1.6 MG/L 43 LBS/DAY
	OCT	Daily Maximum	15.7 MG/L 432 LBS/DAY
	NOV	30 Day Average	2.3 MG/L 64 LBS/DAY
	NOV	Daily Maximum	14.7 MG/L 404 LBS/DAY
	DEC	30 Day Average	2.5 MG/L 68 LBS/DAY
	DEC	Daily Maximum	16.0 MG/L 439 LBS/DAY
CADMIUM, TOTAL (AS CD)			
	Yearly	30 Day Average	0.0004523 MG/L 0.01245 LBS/DAY
	Yearly	Daily Maximum	0.004316 MG/L 0.1188 LBS/DAY
CHLORINE, TOTAL RESIDUAL			
	Yearly	30 Day Average	0.008 MG/L 0.216 LBS/DAY
	Yearly	Daily Maximum	0.019 MG/L 0.523 LBS/DAY
NITRATE NITROGEN (AS N)			
	Yearly	30 Day Average	760 LBS/DAY
	Yearly	Daily Maximum	1,244 LBS/DAY

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

Outfall: 001 Effective Dates: 10/01/2021 to 09/30/2026			
Parameter	**Season**	**Limit Type**	**Limits**
COPPER, TOTAL (AS CU)			
	Yearly	30 Day Average	0.01687 MG/L 0.4642 LBS/DAY
	Yearly	Daily Maximum	0.02690 MG/L 0.7403 LBS/DAY
ACUTE TOXICITY, CERIODAPHNIA			
	Yearly	Daily Maximum	1 NO TOXICITY
ACUTE TOXICITY, PIMEPHALES			
	Yearly	Daily Maximum	1 NO TOXICITY
DISSOLVED OXYGEN			
	Yearly	Daily Minimum	5.0 MG/L
PH			
	Yearly	Daily Maximum	9.0 STD UNITS
	Yearly	Daily Minimum	6.5 STD UNITS
E. COLI			
	MAR	Geometric Mean	630 #/100 ML
	APR	Geometric Mean	630 #/100 ML
	MAY	Geometric Mean	630 #/100 ML
	JUN	Geometric Mean	630 #/100 ML
	JUL	Geometric Mean	630 #/100 ML
	AUG	Geometric Mean	630 #/100 ML
	SEP	Geometric Mean	630 #/100 ML
	OCT	Geometric Mean	630 #/100 ML
	NOV	Geometric Mean	630 #/100 ML

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

003 DISCHARGE FROM TRICKLING FILTER/ROTATING BIOLOGICAL CONTACTOR WASTEWATER TREATMENT FACILITY

Outfall: 003 Effective Dates: 10/01/2021 to 09/30/2026

Parameter	Season	Limit Type	Limits	
CBOD5			**85% Removal Required**	
	Yearly	7 Day Average	40 MG/L	1,101 LBS/DAY
	Yearly	30 Day Average	25 MG/L	688 LBS/DAY
TOTAL SUSPENDED SOLIDS			**85% Removal Required**	
	Yearly	7 Day Average	45 MG/L	1,238 LBS/DAY
	Yearly	30 Day Average	30 MG/L	826 LBS/DAY
AMMONIA NITROGEN (N)				
	JAN	30 Day Average	8.2 MG/L	214 LBS/DAY
	JAN	Daily Maximum	16.1 MG/L	429 LBS/DAY
	FEB	30 Day Average	9.4 MG/L	246 LBS/DAY
	FEB	Daily Maximum	15.2 MG/L	403 LBS/DAY
	MAR	30 Day Average	4.9 MG/L	128 LBS/DAY
	MAR	Daily Maximum	15.4 MG/L	413 LBS/DAY
	APR	30 Day Average	3.6 MG/L	95 LBS/DAY
	APR	Daily Maximum	16.3 MG/L	439 LBS/DAY
	MAY	30 Day Average	3.2 MG/L	86 LBS/DAY
	MAY	Daily Maximum	15.8 MG/L	359 LBS/DAY
	JUN	30 Day Average	2.2 MG/L	59 LBS/DAY

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

Outfall: 003 Effective Dates: 10/01/2021 to 09/30/2026

Parameter	Season	Limit Type	Limits
AMMONIA NITROGEN (N)			
	JUN	Daily Maximum	15.0 MG/L 234 LBS/DAY
	JUL	30 Day Average	2.2 MG/L 58 LBS/DAY
	JUL	Daily Maximum	12.2 MG/L 179 LBS/DAY
	AUG	30 Day Average	2.0 MG/L 53 LBS/DAY
	AUG	Daily Maximum	12.9 MG/L 184 LBS/DAY
	SEP	30 Day Average	2.5 MG/L 66 LBS/DAY
	SEP	Daily Maximum	14.5 MG/L 215 LBS/DAY
	OCT	30 Day Average	3.7 MG/L 97 LBS/DAY
	OCT	Daily Maximum	16.4 MG/L 418 LBS/DAY
	NOV	30 Day Average	5.6 MG/L 146 LBS/DAY
	NOV	Daily Maximum	15.2 MG/L 411 LBS/DAY
	DEC	30 Day Average	5.9 MG/L 155 LBS/DAY
	DEC	Daily Maximum	16.6 MG/L 448 LBS/DAY
CADMIUM, TOTAL (AS CD)			
	Yearly	30 Day Average	0.0006277 MG/L 0.01464 LBS/DAY
	Yearly	Daily Maximum	0.004474 MG/L 0.1208 LBS/DAY
CHLORINE, TOTAL RESIDUAL			
	Yearly	30 Day Average	0.012 MG/L 0.274 LBS/DAY
	Yearly	Daily Maximum	0.020 MG/L 0.536 LBS/DAY
NITRATE NITROGEN (AS N)			
	Yearly	30 Day Average	760 LBS/DAY
	Yearly	Daily Maximum	1,244 LBS/DAY

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

Outfall: 003 Effective Dates: 10/01/2021 to 09/30/2026			
Parameter	**Season**	**Limit Type**	**Limits**
COPPER, TOTAL (AS CU)			
	Yearly	30 Day Average	0.02177 MG/L 0.5256 LBS/DAY
	Yearly	Daily Maximum	0.02773 MG/L 0.7507 LBS/DAY
ACUTE TOXICITY, CERIODAPHNIA			
	Yearly	Daily Maximum	1 NO TOXICITY
ACUTE TOXICITY, PIMEPHALES			
	Yearly	Daily Maximum	1 NO TOXICITY
DISSOLVED OXYGEN			
	Yearly	Daily Minimum	4.3 MG/L
PH			
	Yearly	Daily Maximum	9.0 STD UNITS
	Yearly	Daily Minimum	6.5 STD UNITS
E. COLI			
	MAR	Geometric Mean	126 #/100 ML
	APR	Geometric Mean	126 #/100 ML
	MAY	Geometric Mean	126 #/100 ML
	JUN	Geometric Mean	126 #/100 ML
	JUL	Geometric Mean	126 #/100 ML
	AUG	Geometric Mean	126 #/100 ML
	SEP	Geometric Mean	126 #/100 ML
	OCT	Geometric Mean	126 #/100 ML
	NOV	Geometric Mean	126 #/100 ML

Monitoring and Reporting Requirements

(a) Samples and measurements taken shall be representative of the volume and nature of the monitored wastewater.

(b) Analytical and sampling methods specified in 40 CFR Part 136 or other methods approved in writing by the department shall be utilized. All effluent samples for which a limit applies must be analyzed using sufficiently sensitive methods (i.e. testing procedures) approved under 567 IAC Chapter 63 and 40 CFR Part 136 for the analysis of pollutants or pollutant parameters or as required under 40 CFR chapter I, subchapter N or O.

For the purposes of this paragraph, an approved method is sufficiently sensitive when:
(1) the method minimum level (ML) is at or below the level of the effluent limit established in the permit for the measured pollutant or pollutant parameter; or
(2) the method has the lowest ML of the approved analytical methods for the measured pollutant or pollutant parameter.

Samples collected for operational testing need not be analyzed by approved analytical methods; however, commonly accepted test methods should be used.

(c) You are required to report all data including calculated results needed to determine compliance with the limitations contained in this permit. The results of any monitoring not specified in this permit performed at the compliance monitoring point and analyzed according to 40 CFR Part 136 shall be included in the calculation and reporting of any data submitted in accordance with this permit. This includes daily maximums and minimums, 30-day averages and 7-day averages for all parameters that have concentration (mg/l) and mass (lbs/day) limits. In addition, flow data shall be reported in million gallons per day (MGD).

(d) Records of monitoring activities and results shall include for all samples: the date, exact place and time of the sampling; the dates the analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses.

(e) Results of all monitoring shall be recorded on forms provided by, or approved by, the department, and shall be submitted to the appropriate regional field office of the department by the fifteenth day following the close of the reporting period. Your reporting period is on a MONTHLY basis, ending on the last day of each reporting period.

(f) Operational performance monitoring for treatment unit process control shall be conducted to ensure that the facility is properly operated in accordance with its design. The results of any operational performance monitoring need not be reported to the department, but shall be maintained in accordance with rule 567 IAC 63.2 (455B). The results of any operational performance monitoring specified in this permit shall be submitted to the department in accordance with these reporting requirements.

(g) Chapter 63 of the rules provides you with further explanation of your monitoring requirements.

Facility Name: WEBSTER CITY, CITY OF STP
Permit Number: 4063001

Outfall	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
The following monitoring requirements shall be in effect from 10/01/2021 to 09/30/2026				
001	BIOCHEMICAL OXYGEN DEMAND (BOD5)	2 TIMES PER WEEK	24 HOUR COMPOSITE	RAW WASTE
001	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	RAW WASTE
001	NITROGEN, TOTAL (AS N)	1 TIME PER WEEK	24 HOUR COMPOSITE	RAW WASTE
001	NITROGEN, TOTAL KJELDAHL (AS N)	1 EVERY MONTH	24 HOUR COMPOSITE	RAW WASTE
001	PH	2 TIMES PER WEEK	GRAB	RAW WASTE
001	PHOSPHORUS, TOTAL (AS P)	1 TIME PER WEEK	24 HOUR COMPOSITE	RAW WASTE
001	TEMPERATURE	2 TIMES PER WEEK	GRAB	RAW WASTE
001	TOTAL SUSPENDED SOLIDS	2 TIMES PER WEEK	24 HOUR COMPOSITE	RAW WASTE
001	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	FINAL EFFLUENT
001	CBOD5	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT PRIOR TO DISINFECTION
001	TOTAL SUSPENDED SOLIDS	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT PRIOR TO DISINFECTION
001	ACUTE TOXICITY, CERIODAPHNIA	1 EVERY 12 MONTHS	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	ACUTE TOXICITY, PIMEPHALES	1 EVERY 12 MONTHS	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	AMMONIA NITROGEN (N)	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	CADMIUM, TOTAL (AS CD)	1 EVERY MONTH	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	CHLORIDE (AS CL)	1 EVERY MONTH	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	CHLORINE, TOTAL RESIDUAL	5 TIMES PER WEEK	GRAB	EFFLUENT AFTER DISINFECTION
001	COPPER, TOTAL (AS CU)	1 EVERY MONTH	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	DISSOLVED OXYGEN	2 TIMES PER WEEK	GRAB	EFFLUENT AFTER DISINFECTION
001	E. COLI	GEO. MEAN 1/3 MONTHS	GRAB	EFFLUENT AFTER DISINFECTION
001	NITRATE NITROGEN (AS N)	1 EVERY MONTH	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	NITROGEN, TOTAL (AS N)	1 TIME PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	PH	5 TIMES PER WEEK	GRAB	EFFLUENT AFTER DISINFECTION
001	PHOSPHORUS, TOTAL (AS P)	1 TIME PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	TEMPERATURE	2 TIMES PER WEEK	GRAB	EFFLUENT AFTER DISINFECTION

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

Outfall	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
The following monitoring requirements shall be in effect from 10/01/2021 to 09/30/2026				
003	BIOCHEMICAL OXYGEN DEMAND (BOD5)	2 TIMES PER WEEK	24 HOUR COMPOSITE	RAW WASTE
003	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	RAW WASTE
003	NITROGEN, TOTAL (AS N)	1 TIME PER WEEK	24 HOUR COMPOSITE	RAW WASTE
003	NITROGEN, TOTAL KJELDAHL (AS N)	1 EVERY MONTH	24 HOUR COMPOSITE	RAW WASTE
003	PH	2 TIMES PER WEEK	GRAB	RAW WASTE
003	PHOSPHORUS, TOTAL (AS P)	1 TIME PER WEEK	24 HOUR COMPOSITE	RAW WASTE
003	TEMPERATURE	2 TIMES PER WEEK	GRAB	RAW WASTE
003	TOTAL SUSPENDED SOLIDS	2 TIMES PER WEEK	24 HOUR COMPOSITE	RAW WASTE
003	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	FINAL EFFLUENT
003	CBOD5	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT PRIOR TO DISINFECTION
003	TOTAL SUSPENDED SOLIDS	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT PRIOR TO DISINFECTION
003	ACUTE TOXICITY, CERIODAPHNIA	1 EVERY 12 MONTHS	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
003	ACUTE TOXICITY, PIMEPHALES	1 EVERY 12 MONTHS	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
003	AMMONIA NITROGEN (N)	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
003	CADMIUM, TOTAL (AS CD)	1 EVERY MONTH	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
003	CHLORINE, TOTAL RESIDUAL	5 TIMES PER WEEK	GRAB	EFFLUENT AFTER DISINFECTION
003	COPPER, TOTAL (AS CU)	1 EVERY MONTH	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
003	DISSOLVED OXYGEN	2 TIMES PER WEEK	GRAB	EFFLUENT AFTER DISINFECTION
003	E. COLI	GEO. MEAN 1/3 MONTHS	GRAB	EFFLUENT AFTER DISINFECTION
003	NITRATE NITROGEN (AS N)	1 EVERY MONTH	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
003	NITROGEN, TOTAL (AS N)	1 TIME PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
003	PH	5 TIMES PER WEEK	GRAB	EFFLUENT AFTER DISINFECTION
003	PHOSPHORUS, TOTAL (AS P)	1 TIME PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
003	TEMPERATURE	2 TIMES PER WEEK	GRAB	EFFLUENT AFTER DISINFECTION

Special Monitoring Requirements

Outfall #	Description
001	**NITROGEN, TOTAL (AS N)**

Total nitrogen shall be determined by testing for Total Kjeldahl Nitrogen (TKN) and nitrate + nitrite nitrogen and reporting the sum of the TKN and nitrate + nitrite results (reported as N). Nitrate + nitrite can be analyzed together or separately.

E. COLI

The limit for E. coli specified in the limit pages of this permit is a geometric mean. The disinfection season is established in the Iowa Administrative Code, Subparagraph 567 IAC 61.3(3)"a"(1), and is in effect from March 15 to November 15. Any disinfection system (chlorine, UV light, etc.) shall be operated to comply with the limit during the entire disinfection season.

The facility must collect and analyze a minimum of five samples in one calendar month during each 3-month period from March 15 to November 15. The 3-month periods are March – May, June – August, and September – November. The collection of five samples in each 3-month period will result in a minimum of 15 samples being collected during a calendar year. For example, for the first 3-month period, the operator may choose April as the calendar month to collect the 5 individual E. coli samples to determine compliance with the limits. The operator may also choose the months of March or May as well, as long as each of the 5 samples is collected during a single calendar month. The same principle applies to the other two 3-month periods during the disinfection season. The following requirements apply to the individual samples collected in one calendar month:
Samples must be spaced over one calendar month.
No more than one sample can be collected on any one day.
There must be a minimum of two days between each sample.
No more than two samples may be collected in a period of seven consecutive days.

If the effluent has been disinfected using chlorine, ultraviolet light (UV), or any other process intended to disrupt the biological integrity of the E. coli, the samples shall be analyzed using the Most Probable Number method found in Standard Method 9223B (Colilert® or Colilert-18® made by IDEXX Laboratories, Inc.). If the effluent has not been disinfected the samples may be analyzed using either the MPN method above or EPA Method 1603: Escherichia coli (E. coli) in water by membrane filtration using modified membrane-thermotolerant E. coli agar (modified mTEC) or mColiBlue-24® made by the Hach Company.

The geometric mean must be calculated using all valid sample results collected during a month. The geometric mean formula is as follows: Geometric Mean = (Sample one * Sample two * Sample three * Sample four *Sample five…Sample N)^(1/N), which is the Nth root of the result of the multiplication of all of the sample results where N = the number of samples. If a sample result is a less than value, the value reported by the lab without the less than sign should be used in the geometric mean calculation.

The geometric mean can be calculated in one of the following ways:
Use a scientific calculator that can calculate the powers of numbers.
Enter the samples in Microsoft Excel and use the function "GEOMEAN" to perform the calculation.
Use the geometric mean calculator on the Iowa DNR webpage at: https://www.iowadnr.gov/Environmental-Protection/Water-Quality/NPDES-Wastewater-Permitting/NPDES-Operator-Information/Bacteria-Sampling

CHLORINE, TOTAL RESIDUAL

TRC monitoring is not required if chlorine is not being utilized at the treatment plant

METALS

Sample and analyze your final effluent for parameters listed below at the frequency of one time per week. EPA approved test methods shall be used to test at a detection level at or below the levels listed after each parameter. If a sample result is not at a detection level which is low enough to demonstrate compliance with the limit in the permit, the facility will be considered to be non-compliant with that limit.

Cadmium	0.0004523 mg/L
Copper	0.01687 mg/L

003 NITROGEN, TOTAL (AS N)

Total nitrogen shall be determined by testing for Total Kjeldahl Nitrogen (TKN) and nitrate + nitrite nitrogen and reporting the sum of the TKN and nitrate + nitrite results (reported as N). Nitrate + nitrite can be analyzed together or separately.

E. COLI

The limit for E. coli specified in the limit pages of this permit is a geometric mean. The disinfection season is established in the Iowa Administrative Code, Subparagraph 567 IAC 61.3(3)"a"(1), and is in effect from March 15 to November 15. Any disinfection system (chlorine, UV light, etc.) shall be operated to comply with the limit during the entire disinfection season.

The facility must collect and analyze a minimum of five samples in one calendar month during each 3-month period from March 15 to November 15. The 3-month periods are March – May, June – August, and September – November. The collection of five samples in each 3-month period will result in a minimum of 15 samples being collected during a calendar year. For example, for the first 3-month period, the operator may choose April as the calendar month to collect the 5 individual E. coli samples to determine compliance with the limits. The operator may also choose the months of March or May as well, as long as each of the 5 samples is collected during a single calendar month. The same principle applies to the other two 3-month periods during the disinfection season. The following requirements apply to the individual samples collected in one calendar month:
Samples must be spaced over one calendar month.
No more than one sample can be collected on any one day.
There must be a minimum of two days between each sample.
No more than two samples may be collected in a period of seven consecutive days.

If the effluent has been disinfected using chlorine, ultraviolet light (UV), or any other process intended to disrupt the biological integrity of the E. coli, the samples shall be analyzed using the Most Probable Number method found in Standard Method 9223B (Colilert® or Colilert-18® made by IDEXX Laboratories, Inc.). If the effluent has not been disinfected the samples may be analyzed using either the MPN method above or EPA Method 1603: Escherichia coli (E. coli) in water by membrane filtration using modified membrane-thermotolerant E. coli agar (modified mTEC) or mColiBlue-24® made by the Hach Company.

The geometric mean must be calculated using all valid sample results collected during a month. The geometric mean formula is as follows: Geometric Mean = (Sample one * Sample two * Sample three * Sample four *Sample five…Sample N)^(1/N), which is the Nth root of the result of the multiplication of all of the sample results where N = the number of samples. If a sample result is a less than value, the value reported by the lab without the less than sign should be used in the geometric mean calculation.

The geometric mean can be calculated in one of the following ways:
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Enter the samples in Microsoft Excel and use the function "GEOMEAN" to perform the calculation.
Use the geometric mean calculator on the Iowa DNR webpage at: https://www.iowadnr.gov/Environmental-Protection/Water-Quality/NPDES-Wastewater-Permitting/NPDES-Operator-Information/Bacteria-Sampling

CHLORINE, TOTAL RESIDUAL

TRC monitoring is not required if chlorine is not being utilized at the treatment plant

METALS

Sample and analyze your final effluent for parameters listed below at the frequency of one time per week. EPA approved test methods shall be used to test at a detection level at or below the levels listed after each parameter. If a sample result is not at a detection level which is low enough to demonstrate compliance with the limit in the permit, the facility will be considered to be non-compliant with that limit.

Cadmium	0.0006277 mg/L
Copper	0.02177 mg/L

Facility Name: WEBSTER CITY, CITY OF STP
Permit Number: 4063001

Significant Industrial User Discharges:

Significant Industrial User: MARY ANN'S SPECIALTY FOODS

Outfall #	**Outfall Description**
001	**INDUSTRIAL EFFLUENT PRIOR TO DISCHARGE TO CITY SEWER.**

Significant Industrial User Effluent Limitations

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

MARY ANN'S SPECIALTY FOODS
Outfall: 001 Effective Dates: 10/01/2021 to 09/30/2026

Parameter	Season	Limit Type	Limit Values
FLOW			
	Yearly	30 Day Average	0.080 MGD
	Yearly	DAILY MAXIMUM	0.110 MGD
BIOCHEMICAL OXYGEN DEMAND (BOD5)			
	Yearly	30 Day Average	300 LBS/DAY
	Yearly	DAILY MAXIMUM	400 LBS/DAY
TOTAL SUSPENDED SOLIDS			
	Yearly	30 Day Average	150 LBS/DAY
	Yearly	DAILY MAXIMUM	250 LBS/DAY
NITROGEN, TOTAL KJELDAHL (AS N)			
	Yearly	30 Day Average	30 LBS/DAY
	Yearly	DAILY MAXIMUM	40 LBS/DAY
OIL AND GREASE			
	Yearly	30 Day Average	100 MG/L
	Yearly	DAILY MAXIMUM	125 MG/L
PH			
	Yearly	DAILY MAXIMUM	11.0 STD UNITS
	Yearly	DAILY MINIMUM	6.0 STD UNITS

Monitoring and Reporting Requirements

(a) Samples and measurements taken shall be representative of the volume and nature of the monitored wastewater.

(b) Analytical and sampling methods specified in 40 CFR Part 136 or other methods approved in writing by the department shall be utilized. All effluent samples for which a limit applies must be analyzed using sufficiently sensitive methods (i.e. testing procedures) approved under 567 IAC Chapter 63 and 40 CFR Part 136 for the analysis of pollutants or pollutant parameters or as required under 40 CFR chapter I, subchapter N or O.

For the purposes of this paragraph, an approved method is sufficiently sensitive when:
(1) the method minimum level (ML) is at or below the level of the effluent limit established in the permit for the measured pollutant or pollutant parameter; or
(2) the method has the lowest ML of the approved analytical methods for the measured pollutant or pollutant parameter.

Samples collected for operational testing need not be analyzed by approved analytical methods; however, commonly accepted test methods should be used.

(c) You are required to report all data including calculated results needed to determine compliance with the limitations contained in this permit. The results of any monitoring not specified in this permit performed at the compliance monitoring point and analyzed according to 40 CFR Part 136 shall be included in the calculation and reporting of any data submitted in accordance with this permit. This includes daily maximums and minimums, 30-day averages and 7-day averages for all parameters that have concentration (mg/l) and mass (lbs/day) limits. In addition, flow data shall be reported in million gallons per day (MGD).

(d) Records of monitoring activities and results shall include for all samples: the date, exact place and time of the sampling; the dates the analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses.

(e) Results of all monitoring shall be recorded on forms provided by, or approved by, the department, and shall be submitted to the appropriate regional field office of the department by the fifteenth day following the close of the reporting period. Your reporting period is on a MONTHLY basis, ending on the last day of each reporting period.

(f) Operational performance monitoring for treatment unit process control shall be conducted to ensure that the facility is properly operated in accordance with its design. The results of any operational performance monitoring need not be reported to the department, but shall be maintained in accordance with rule 567 IAC 63.2 (455B). The results of any operational performance monitoring specified in this permit shall be submitted to the department in accordance with these reporting requirements.

(g) Chapter 63 of the rules provides you with further explanation of your monitoring requirements.

MARY ANN'S SPECIALTY FOODS

Outfall	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
001	BIOCHEMICAL OXYGEN DEMAND (BOD5)	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	PRIOR TO DISCHARGE TO CITY SEWER
001	NITROGEN, TOTAL KJELDAHL (AS N)	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	OIL AND GREASE	1 EVERY 2 WEEKS	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	PH	1 TIME PER WEEK	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	TOTAL SUSPENDED SOLIDS	1 EVERY 2 WEEKS	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER

Facility Name: WEBSTER CITY, CITY OF STP
Permit Number: 4063001

Significant Industrial User Discharges:

Significant Industrial User: WEBSTER CITY CUSTOM MEATS INC

Outfall #	**Outfall Description**
001	**INDUSTRIAL EFFLUENT PRIOR TO DISCHARGE TO CITY SEWER.**

Significant Industrial User Effluent Limitations

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

WEBSTER CITY CUSTOM MEATS INC
Outfall: 001 Effective Dates: 10/01/2021 to 09/30/2026

Parameter	Season	Limit Type	Limit Values
FLOW			
	Yearly	30 Day Average	0.080 MGD
	Yearly	DAILY MAXIMUM	0.110 MGD
BIOCHEMICAL OXYGEN DEMAND (BOD5)			
	Yearly	30 Day Average	600 LBS/DAY
	Yearly	DAILY MAXIMUM	900 LBS/DAY
TOTAL SUSPENDED SOLIDS			
	Yearly	30 Day Average	200 LBS/DAY
	Yearly	DAILY MAXIMUM	300 LBS/DAY
NITROGEN, TOTAL KJELDAHL (AS N)			
	Yearly	30 Day Average	60 LBS/DAY
	Yearly	DAILY MAXIMUM	80 LBS/DAY
OIL AND GREASE			
	Yearly	30 Day Average	100 MG/L
	Yearly	DAILY MAXIMUM	125 MG/L
PH			
	Yearly	DAILY MAXIMUM	11.0 STD UNITS
	Yearly	DAILY MINIMUM	6.0 STD UNITS

Monitoring and Reporting Requirements

(a) Samples and measurements taken shall be representative of the volume and nature of the monitored wastewater.

(b) Analytical and sampling methods specified in 40 CFR Part 136 or other methods approved in writing by the department shall be utilized. All effluent samples for which a limit applies must be analyzed using sufficiently sensitive methods (i.e. testing procedures) approved under 567 IAC Chapter 63 and 40 CFR Part 136 for the analysis of pollutants or pollutant parameters or as required under 40 CFR chapter I, subchapter N or O.

For the purposes of this paragraph, an approved method is sufficiently sensitive when:
(1) the method minimum level (ML) is at or below the level of the effluent limit established in the permit for the measured pollutant or pollutant parameter; or
(2) the method has the lowest ML of the approved analytical methods for the measured pollutant or pollutant parameter.

Samples collected for operational testing need not be analyzed by approved analytical methods; however, commonly accepted test methods should be used.

(c) You are required to report all data including calculated results needed to determine compliance with the limitations contained in this permit. The results of any monitoring not specified in this permit performed at the compliance monitoring point and analyzed according to 40 CFR Part 136 shall be included in the calculation and reporting of any data submitted in accordance with this permit. This includes daily maximums and minimums, 30-day averages and 7-day averages for all parameters that have concentration (mg/l) and mass (lbs/day) limits. In addition, flow data shall be reported in million gallons per day (MGD).

(d) Records of monitoring activities and results shall include for all samples: the date, exact place and time of the sampling; the dates the analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses.

(e) Results of all monitoring shall be recorded on forms provided by, or approved by, the department, and shall be submitted to the appropriate regional field office of the department by the fifteenth day following the close of the reporting period. Your reporting period is on a MONTHLY basis, ending on the last day of each reporting period.

(f) Operational performance monitoring for treatment unit process control shall be conducted to ensure that the facility is properly operated in accordance with its design. The results of any operational performance monitoring need not be reported to the department, but shall be maintained in accordance with rule 567 IAC 63.2 (455B). The results of any operational performance monitoring specified in this permit shall be submitted to the department in accordance with these reporting requirements.

(g) Chapter 63 of the rules provides you with further explanation of your monitoring requirements.

Facility Name: WEBSTER CITY, CITY OF STP
Permit Number: 4063001

WEBSTER CITY CUSTOM MEATS INC

Outfall	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
001	BIOCHEMICAL OXYGEN DEMAND (BOD5)	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	PRIOR TO DISCHARGE TO CITY SEWER
001	NITROGEN, TOTAL KJELDAHL (AS N)	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	OIL AND GREASE	1 TIME PER WEEK	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	PH	1 TIME PER WEEK	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	TOTAL SUSPENDED SOLIDS	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER

Facility Name: WEBSTER CITY, CITY OF STP
Permit Number: 4063001

Significant Industrial User Discharges:

Significant Industrial User: MERTZ ENGINEERING, INC.

Outfall #	Outfall Description
001	METAL FINISHING WASTEWATER PRIOR TO DISCHARGE TO CITY SEWER

Significant Industrial User Effluent Limitations

You are prohibited from discharging pollutants except in compliance with the following effluent limitations:

MERTZ ENGINEERING, INC.
Outfall: 001 Effective Dates: 10/01/2021 to 09/30/2026

Parameter	Season	Limit Type	Limit Values
FLOW			
	Yearly	30 Day Average	0.004 MGD
	Yearly	DAILY MAXIMUM	0.008 MGD
ZINC, TOTAL (AS ZN)			
	Yearly	30 Day Average	1.48 MG/L 0.0494 LBS/DAY
	Yearly	DAILY MAXIMUM	2.61 MG/L 0.0871 LBS/DAY
CADMIUM, TOTAL (AS CD)			
	Yearly	30 Day Average	0.07 MG/L 0.0023 LBS/DAY
	Yearly	DAILY MAXIMUM	0.11 MG/L 0.0037 LBS/DAY
CHROMIUM, TOTAL (AS CR)			
	Yearly	30 Day Average	1.71 MG/L 0.0570 LBS/DAY
	Yearly	DAILY MAXIMUM	2.77 MG/L 0.0924 LBS/DAY
CYANIDE, TOTAL (AS CN)			
	Yearly	30 Day Average	0.15 MG/L 0.0050 LBS/DAY
	Yearly	DAILY MAXIMUM	1.2 MG/L 0.0400 LBS/DAY
NICKEL, TOTAL (AS NI)			
	Yearly	30 Day Average	2.38 MG/L 0.0794 LBS/DAY
	Yearly	DAILY MAXIMUM	3.98 MG/L 0.1328 LBS/DAY

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

MERTZ ENGINEERING, INC.
Outfall: 001 Effective Dates: 10/01/2021 to 09/30/2026

Parameter	Season	Limit Type	Limit Values
COPPER, TOTAL (AS CU)			
	Yearly	30 Day Average	2.07 MG/L 0.0691 LBS/DAY
	Yearly	DAILY MAXIMUM	3.38 MG/L 0.1128 LBS/DAY
LEAD, TOTAL (AS PB)			
	Yearly	30 Day Average	0.43 MG/L 0.0143 LBS/DAY
	Yearly	DAILY MAXIMUM	0.69 MG/L 0.0230 LBS/DAY
PH			
	Yearly	DAILY MAXIMUM	11.0 STD UNITS
	Yearly	DAILY MINIMUM	6.0 STD UNITS
SILVER, TOTAL (AS AG)			
	Yearly	30 Day Average	0.24 MG/L 0.0080 LBS/DAY
	Yearly	DAILY MAXIMUM	0.43 MG/L 0.0143 LBS/DAY
TOTAL TOXIC ORGANICS			
	Yearly	DAILY MAXIMUM	2.13 MG/L 0.0711 LBS/DAY

Monitoring and Reporting Requirements

(a) Samples and measurements taken shall be representative of the volume and nature of the monitored wastewater.

(b) Analytical and sampling methods specified in 40 CFR Part 136 or other methods approved in writing by the department shall be utilized. All effluent samples for which a limit applies must be analyzed using sufficiently sensitive methods (i.e. testing procedures) approved under 567 IAC Chapter 63 and 40 CFR Part 136 for the analysis of pollutants or pollutant parameters or as required under 40 CFR chapter I, subchapter N or O.

For the purposes of this paragraph, an approved method is sufficiently sensitive when:
(1) the method minimum level (ML) is at or below the level of the effluent limit established in the permit for the measured pollutant or pollutant parameter; or
(2) the method has the lowest ML of the approved analytical methods for the measured pollutant or pollutant parameter.

Samples collected for operational testing need not be analyzed by approved analytical methods; however, commonly accepted test methods should be used.

(c) You are required to report all data including calculated results needed to determine compliance with the limitations contained in this permit. The results of any monitoring not specified in this permit performed at the compliance monitoring point and analyzed according to 40 CFR Part 136 shall be included in the calculation and reporting of any data submitted in accordance with this permit. This includes daily maximums and minimums, 30-day averages and 7-day averages for all parameters that have concentration (mg/l) and mass (lbs/day) limits. In addition, flow data shall be reported in million gallons per day (MGD).

(d) Records of monitoring activities and results shall include for all samples: the date, exact place and time of the sampling; the dates the analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses.

(e) Results of all monitoring shall be recorded on forms provided by, or approved by, the department, and shall be submitted to the appropriate regional field office of the department by the fifteenth day following the close of the reporting period. Your reporting period is on a MONTHLY basis, ending on the last day of each reporting period.

(f) Operational performance monitoring for treatment unit process control shall be conducted to ensure that the facility is properly operated in accordance with its design. The results of any operational performance monitoring need not be reported to the department, but shall be maintained in accordance with rule 567 IAC 63.2 (455B). The results of any operational performance monitoring specified in this permit shall be submitted to the department in accordance with these reporting requirements.

(g) Chapter 63 of the rules provides you with further explanation of your monitoring requirements.

Facility Name: WEBSTER CITY, CITY OF STP
Permit Number: 4063001

MERTZ ENGINEERING, INC.

Outfall	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
001	CADMIUM, TOTAL (AS CD)	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	CHROMIUM, TOTAL (AS CR)	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	COPPER, TOTAL (AS CU)	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	CYANIDE, TOTAL (AS CN)	2 PER MONTH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	PRIOR TO DISCHARGE TO CITY SEWER
001	LEAD, TOTAL (AS PB)	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	NICKEL, TOTAL (AS NI)	2 PER MONTH	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	PH	1 TIME PER WEEK	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	SILVER, TOTAL (AS AG)	1 TIME PER WEEK	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	TOTAL TOXIC ORGANICS	2 PER MONTH	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	ZINC, TOTAL (AS ZN)	2 PER MONTH	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER

Outfall Number: 001

Ceriodaphnia and Pimephales Toxicity Effluent Testing

1. For facilities that have not been required to conduct toxicity testing by a previous NPDES permit, the initial annual toxicity test shall be conducted within three (3) months of permit issuance. For facilities that have been required to conduct toxicity testing by a previous NPDES permit, the initial annual toxicity test shall be conducted within twelve months (12) of the last toxicity test.

2. The test organisms that are to be used for acute toxicity testing shall be Ceriodaphnia dubia and Pimephales promelas. The acute toxicity testing procedures used to demonstrate compliance with permit limits shall be those listed in 40 CFR Part 136 and adopted by reference in rule 567 IAC 63.1(1). The method for measuring acute toxicity is specified in USEPA, October 2002, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. USEPA, Office of Water, Washington, D.C., EPA 821-R-02-012.

3. The diluted effluent sample must contain a minimum of 100.00 % effluent and no more than 0.00 % of culture water.

4. One valid positive toxicity result will require, at a minimum, quarterly testing for effluent toxicity until three successive tests are determined not to be positive.

5. Two successive valid positive toxicity results or three positive results out of five successive valid effluent toxicity tests will require a toxicity reduction evaluation to be completed to eliminate the toxicity.

6. A non-toxic test result shall be indicated as a "1" on the monthly operation report. A toxic test result shall be indicated as a "2" on the monthly operation report. DNR Form 542-1381 shall also be submitted to the DNR field office along with the monthly operation report.

Ceriodaphnia and Pimephales Toxicity Effluent Limits

The maximum limit of "1" for the parameters Acute Toxicity, Ceriodaphnia and Acute Toxicity, Pimephales means no positive toxicity results.

Definition: "Positive toxicity result" means a statistical difference of mortality rate between the control and the diluted effluent sample. For more information, see USEPA, October 2002, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, USEPA, Office of Water, Washington, D.C., EPA 821-R-02-012.

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

Outfall Number: 003

Ceriodaphnia and Pimephales Toxicity Effluent Testing

1. For facilities that have not been required to conduct toxicity testing by a previous NPDES permit, the initial annual toxicity test shall be conducted within three (3) months of permit issuance. For facilities that have been required to conduct toxicity testing by a previous NPDES permit, the initial annual toxicity test shall be conducted within twelve months (12) of the last toxicity test.

2. The test organisms that are to be used for acute toxicity testing shall be Ceriodaphnia dubia and Pimephales promelas. The acute toxicity testing procedures used to demonstrate compliance with permit limits shall be those listed in 40 CFR Part 136 and adopted by reference in rule 567 IAC 63.1(1). The method for measuring acute toxicity is specified in USEPA, October 2002, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. USEPA, Office of Water, Washington, D.C., EPA 821-R-02-012.

3. The diluted effluent sample must contain a minimum of 94.90 % effluent and no more than 5.10 % of culture water.

4. One valid positive toxicity result will require, at a minimum, quarterly testing for effluent toxicity until three successive tests are determined not to be positive.

5. Two successive valid positive toxicity results or three positive results out of five successive valid effluent toxicity tests will require a toxicity reduction evaluation to be completed to eliminate the toxicity.

6. A non-toxic test result shall be indicated as a "1" on the monthly operation report. A toxic test result shall be indicated as a "2" on the monthly operation report. DNR Form 542-1381 shall also be submitted to the DNR field office along with the monthly operation report.

Ceriodaphnia and Pimephales Toxicity Effluent Limits

The maximum limit of "1" for the parameters Acute Toxicity, Ceriodaphnia and Acute Toxicity, Pimephales means no positive toxicity results.

Definition: "Positive toxicity result" means a statistical difference of mortality rate between the control and the diluted effluent sample. For more information, see USEPA, October 2002, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, USEPA, Office of Water, Washington, D.C., EPA 821-R-02-012.

Facility Name: WEBSTER CITY, CITY OF STP

Permit Number: 4063001

Design Capacity

Design: 1

The design capacity for the treatment works is specified in Construction Permit Number 2000-2-S, issued Tuesday, October 05, 1999. The treatment plant is designed to treat:

* An average dry weather (ADW) flow of 1.5 Million Gallons Per Day (MGD).
* An average wet weather (AWW) flow of 3.3 Million Gallons Per Day (MGD).
* A maximum wet weather (MWW) flow of 6.0 Million Gallons Per Day (MGD).
* A design 5-day biochemical oxygen demand (BOD5) load of 4,150 lbs/day.
* A design Total Kjeldahl Nitrogen (TKN) load of 400 lbs/day.

Operator Certification Type/Grade: WW/III

Wastes in such volumes or quantities as to exceed the design capacity of the treatment works or reduce the effluent quality below that specified in the operation permit of the treatment works are considered to be a waste which interferes with the operation or performance of the treatment works and are prohibited by subrule IAC 567-62.1(7).

SEWAGE SLUDGE HANDLING AND DISPOSAL REQUIREMENTS

"Sewage sludge" is solid, semisolid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge does not include the grit and screenings generated during preliminary treatment.

1. The permittee shall comply with all existing Federal and State laws and regulations that apply to the use and disposal of sewage sludge and with technical standards developed pursuant to Section 405(d) of the Clean Water Act when such standards are promulgated. If an applicable numerical limit or management practice for pollutants in sewage sludge is promulgated after issuance of this permit that is more stringent than a sludge pollutant limit or management practice specified in existing Federal or State laws or regulations, this permit shall be modified, or revoked and reissued, to conform to the regulations promulgated under Section 405(d) of the Clean Water Act. The permittee shall comply with the limitation no later than the compliance deadline specified in the applicable regulations.

2. The permittee shall provide written notice to the Department of Natural Resources prior to any planned changes in sludge disposal practices.

3. Land application of sewage sludge shall be conducted in accordance with criteria established in rule IAC 567 67.1 through 67.11 (455B).

MAJOR CONTRIBUTING INDUSTRIES LIMITATIONS, MONITORING AND REPORTING REQUIREMENTS

1. You are required to notify the department, in writing, of any of the following:

(a) 180 days prior to the introduction of pollutants to your facility from a significant industrial user. A significant industrial user means an industrial user of a treatment works that:
 (1) Discharges an average of 25,000 gallons per day or more of process wastewater excluding sanitary, noncontact cooling and boiler blowdown wastewater;
 (2) Contributes a process waste stream which makes up five percent or more of the average dry weather hydraulic or organic capacity of the publicly-owned treatment works:
 (3) Is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or
 (4) Is designated by the department as a significant industrial user on the basis that the contributing industry, either singly or in combination with other contributing industries, has a reasonable potential for adversely affecting the operation of or effluent quality from the publicly-owned treatment works or for violating any pretreatment standards or requirements.

(b) 60 days prior to a proposed expansion, production increase or process modification that may result in the discharge of a new pollutant or a discharge in excess of limitations stated in the existing treatment agreement.

(c) 10 days prior to any commitment by you to accept waste from any new significant industrial user. Your written notification must include a new or revised treatment agreement in accordance with rule 64.3(5)(455B).

2. You shall require all users of your facility to comply with Sections 204(b), 307 and 308 of the Clean Water Act.

Section 204(b) requires that all users of the treatment works constructed with funds provided under Sections 201(g) or 601 of the Act to pay their proportionate share of the costs of operation, maintenance and replacement of the treatment works.

Section 307 of the Act requires users to comply with pretreatment standards promulgated by EPA for pollutants that would cause interference with the treatment process or would pass through the treatment works.

Section 308 of the Act requires users to allow access at reasonable times to state and EPA inspectors for the purpose of sampling the discharge and reviewing and copying records.

3. You shall limit and monitor pollutants for each significant industrial user as required elsewhere in this permit, and submit sample results to the department monthly. Your report shall be submitted by the fifteenth day of the following month.

Revised: June 16, 2009 CAC

Nutrient Reduction Strategy Construction Schedule

Total Nitrogen and Total Phosphorus – Outfall 001 & Outfall 003

The City of Webster City shall implement the strategy recommended in the Nutrient Reduction Strategy Feasibility Report submitted on March 1, 2018 and approved by the Department on March 7, 2018 for reducing total nitrogen and total phosphorus in the final effluent. Construction of improvements shall be implemented according to the following schedule:

- Submit progress report by **March 1, 2022.**
- Submit progress report by **March 1, 2023.**
- Complete construction of improvements by **March 1, 2024.**
- Complete 6 months of treatment plant optimization for nutrient reduction by **September 1, 2024.**
- Submit one year of at least weekly total nitrogen and total phosphorus sampling data from the raw waste and final effluent by **October 1, 2025**. The report must include the results of all monitoring for total nitrogen in the raw waste and final effluent between September 1, 2024 and August 31, 2025.

Progress reports shall be submitted by the required due dates. Within fourteen (14) days following all dates of construction completion, optimization completion, and one year of monitoring, the permittee shall provide written notice of compliance with the scheduled event along with any applicable data. All written notices and progress reports shall be sent to the following addresses:

npdes.mail@dnr.iowa.gov
Subject: Nutrient Reduction Strategy (4063001)

Iowa Department of Natural Resources
Environmental Services Division
DNR Field Office 2
2300 15th Street SW
Mason City, IA 50401-5630

STANDARD CONDITIONS

1. ADMINISTRATIVE RULES

Rules of this Department that govern the operation of your facility in connection with this permit are published in Part 567 of the Iowa Administrative Code (IAC) in Chapters 60-65, 67, and 121. Reference to the term "rule" in this permit means the designated provision of Part 567 of the IAC. Reference to the term "CFR" means the Code of Federal Regulations.

2. DEFINITIONS

(a) 7 day average means the sum of the total daily discharges by mass, volume, or concentration during a 7 consecutive day period, divided by the total number of days during the period that measurements were made. Four 7 consecutive day periods shall be used each month to calculate the 7-day average. The first 7-day period shall begin with the first day of the month.

(b) 30 day average means the sum of the total daily discharges by mass, volume, or concentration during a calendar month, divided by the total number of days during the month that measurements were made.

(c) Daily maximum means the total discharge by mass, volume, or concentration during a twenty-four hour period.

3. DUTY TO PROVIDE INFORMATION

You must furnish to the Director, within a reasonable time, any information the Director may request to determine compliance with this permit or determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, in accordance with 567 IAC 64.3(11)"*c*". You must also furnish to the Director, upon request, copies of any records required to be kept by this permit.

4. MONITORING AND RECORDS OF OPERATION

(a) Maintenance of records. You shall retain for a minimum of three years all paper and electronic records of monitoring activities and results including all original strip chart recordings for continuous monitoring instrumentation and calibration and maintenance records. ***{See 567 IAC 63.2(3)}***

(b) Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 or by imprisonment for not more than two years, or both. ***{See 40 CFR 122.41(j)(5)}***

5. SIGNATORY REQUIREMENTS

Applications, reports or other information submitted to the Department in connection with this permit must be signed and certified in accordance with 567 IAC 64.3(8).

6. OTHER INFORMATION

Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, you must promptly submit such facts or information. Where you become aware that you failed to submit any relevant facts in the submission of in any report to the director, including records of operation, you shall promptly submit such facts or information. ***{See 567 IAC 60.4(2)"a" and 567 IAC 63.7}***

7. TRANSFER OF TITLE OR OWNER ADDRESS CHANGE

If title to your facility, or any part of it, is transferred the new owner shall be subject to this permit. You are required to notify the new owner of the requirements of this permit in writing prior to any transfer of title. The Director shall be notified in writing within 30 days of the transfer. No transfer of the authorization to discharge from the facility represented by the permit shall take place prior to notifying the department of the transfer of title. Whenever the address of the owner is changed, the department shall be notified in writing within 30 days of the address change. Electronic notification is not sufficient; all title transfers or address changes must be reported to the department by mail. ***{See 567 IAC 64.14}***

8. PROPER OPERATION AND MAINTENANCE

All facilities and control systems shall be operated as efficiently as possible and maintained in good working order. A sufficient number of staff, adequately trained and knowledgeable in the operation of your facility shall be retained at all times and adequate laboratory controls and appropriate quality assurance procedures shall be provided to maintain compliance with the conditions of this permit.
{See 40 CFR 122.41(e) and 567 IAC 64.7(7)"f"}

9. PERMIT MODIFICATION, SUSPENSION OR REVOCATION

(a) This permit may be modified, suspended, or revoked and reissued for cause including but not limited to those specified in 567 IAC 64.3(11).

(b) This permit may be modified due to conditions or information on which this permit is based, including any new standard the department may adopt that would change the required effluent limits. ***{See 567 IAC 64.3(11)}***

(c) If a toxic pollutant is present in your discharge and more stringent standards for toxic pollutants are established under Section 307(a) of the Clean Water Act, this permit will be modified in accordance with the new standards.
{See 40 CFR 122.62(a)(6) and 567 IAC 64.7(7)"g"}

The filing of a request for a permit modification, revocation or suspension, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

10. DUTY TO REAPPLY AND PERMIT CONTINUATION

If you wish to continue to discharge after the expiration date of this permit, you must file a complete application for reissuance at least 180 days prior to the expiration date of this permit. If a timely and sufficient application is submitted, this permit will remain in effect until the Department makes a final determination on the permit application. ***{See 567 IAC 64.8(1) and Iowa Code 17A.18}***

11. DUTY TO COMPLY

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Issuance of this permit does not relieve you of the responsibility to comply with all local, state and federal laws, ordinances, regulations or other legal requirements applying to the operation of your facility. ***{See 40 CFR 122.41(a) and 567 IAC 64.7(4)"e"}***

STANDARD CONDITIONS

12. DUTY TO MITIGATE
You shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. ***{See 40 CFR 122.41(d) and 567 IAC 64.7(7)"i"}***

13. TWENTY-FOUR HOUR REPORTING
You shall report any noncompliance that may endanger human health or the environment, including, but not limited to, violations of maximum daily limits for any toxic pollutant (listed as toxic under 307(a)(1) of the Clean Water Act) or hazardous substance (as designated in 40 CFR Part 116 pursuant to 311 of the Clean Water Act). Information shall be provided orally within 24 hours from the time you become aware of the circumstances. A written submission that includes a description of noncompliance and its cause; the period of noncompliance including exact dates and times, whether the noncompliance has been corrected or the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent a reoccurrence of the noncompliance must be provided within 5 days of the occurrence. ***{See 567 IAC 63.12}***

14. OTHER NONCOMPLIANCE
You shall report all instances of noncompliance not reported under Condition #13 at the time monitoring reports are submitted. You shall give advance notice to the appropriate regional field office of the department of any planned activity which may result in noncompliance with permit requirements. ***{See 567 IAC 63.14}***

15. INSPECTION OF PREMISES, RECORDS, EQUIPMENT, METHODS AND DISCHARGES
You are required to permit authorized personnel to:
(a) Enter upon the premises where a regulated facility or activity is located or conducted or where records are kept under conditions of this permit;
(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
(c) Inspect, at reasonable times, any facilities, equipment, practices or operations regulated or required under this permit; and
(d) Sample or monitor, at reasonable times, to assure compliance or as otherwise authorized by the Clean Water Act.

16. FAILURE TO SUBMIT FEES
This permit may be revoked, in whole or in part, if the appropriate permit fees are not submitted within thirty (30) days of the date of notification that such fees are due. ***{See 567 IAC 64.16(1)}***

17. NEED TO HALT OR REDUCE ACTIVITY
It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. ***{See 40 CFR 122.41(c) and 567 IAC 64.7(7)"j"}***

18. NOTICE OF CHANGED CONDITIONS
You are required to notify the director of any changes in existing conditions or information on which this permit is based. This includes, but is not limited to, the following:
(a) If your facility is a publicly owned treatment works (POTW) or otherwise may accept waste for treatment from an indirect discharger or industrial contributor (See 567 IAC 64.3(5) for further notice requirements).
(b) If your facility is a POTW and there is any substantial change in the volume or character of pollutants being introduced to the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit. ***{See 40 CFR 122.42(b)}***
(c) As soon as you know or have reason to believe that any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in this permit. ***{See 40 CFR 122.42(a)}***
(d) If you have begun or will begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant which was not reported in the permit application.

19. PLANNED CHANGES
The permittee shall give notice to the appropriate regional field office of the department 30 days prior to any planned physical alterations or additions to the permitted facility. Notice is required only when:
(a) Notice has not been given to any other section of the department. (Note: Facility expansions, production increases, or process modifications which may result in new or increased discharges of pollutants must be reported to the Director in advance. If such discharges will exceed effluent limitations, your report must include an application for a new permit. If any modification of, addition to, or construction of a disposal system is to be made, you must first obtain a written permit from this Department. In addition, no construction activity that will result in disturbance of one acre or more shall be initiated without first obtaining coverage under NPDES General Permit No. 2 for "Storm water discharge associated with construction activity.") ***{See 567 IAC 64.7(7)"a" and 64.2}***
(b) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source as defined in 567 IAC 60.2;
(c) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices; or
(d) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in the permit. ***{See 567 IAC 63.13 and 63.14}***

20. USE OF CERTIFIED LABORATORIES
Analyses of wastewater, groundwater or sewage sludge that are required to be submitted to the department as a result of this permit must be performed by a laboratory certified by the State of Iowa. Routine, on-site monitoring for pH, temperature, dissolved oxygen, total residual chlorine and other pollutants that must be analyzed immediately upon sample collection, settleable solids, physical measurements, and operational monitoring tests specified in 567 IAC 63.3(4) are excluded from this requirement.

21. BYPASSES

(a) Definition. "Bypass" means the diversion of waste streams from any portion of a treatment facility or collection system. A bypass does not include internal operational waste stream diversions that are part of the design of the treatment facility, maintenance diversions where redundancy is provided, diversions of wastewater from one point in a collection system to another point in a collection system, or wastewater backups into buildings that are caused in the building lateral or private sewer line.

(b) Prohibitions.

i. Bypasses from any portion of a treatment facility or from a sanitary sewer collection system designed to carry only sewage are prohibited.

ii. Bypass is prohibited and the department may not assess a civil penalty against a permittee for bypass if the permittee has complied with all of the following:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

(2) There were no feasible alternatives to the bypass such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The permittee submitted notices as required by paragraph (d) of this section.

(c) The Director may approve an anticipated bypass after considering its adverse effects if the Director determines that it will meet the three conditions listed above and a request for bypass has been submitted to the Department in accordance with 567 IAC 63.6(2).

(d) Reporting bypasses. Bypasses shall be reported in accordance with 567 IAC 63.6.

22. UPSET PROVISION

(a) Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) Effect of an upset. An upset constitutes an affirmative defense in an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph *"c"* of this condition are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

(c) Conditions necessary for demonstration of an upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed operating logs or other relevant evidence that;

i. An upset occurred and that the permittee can identify the cause(s) of the upset;

ii. The permitted facility was at the time being properly operated;

iii. The permittee submitted notice of the upset to the Department in accordance with 567 IAC 63.6(3); and

iv. The permittee complied with any remedial measures required in accordance with 567 IAC 63.6(6)"*b*".

(d) Burden of Proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

23. PROPERTY RIGHTS

This permit does not convey any property rights of any sort or any exclusive privilege. ***{See 567 IAC 64.4(3)"b"}***

24. EFFECT OF A PERMIT

Compliance with a permit during its term constitutes compliance, for purposes of enforcement, with Sections 301, 302, 306, 307, 318, 403 and 405(a)-(b) of the Clean Water Act, and equivalent limitations and standards set out in 567 IAC Chapters 61 and 62. ***{See 567 IAC 64.4(3)"a"}***

25. SEVERABILITY

The provisions of this permit are severable and if any provision or application of any provision to any circumstance is found to be invalid by this department or a court of law, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected by such finding.

Appendix B: Monitoring Data Summary

Table B.1 Daily Monitoring Data Summary

City of Webster City, Iowa
2012-2019 Wastewater Monitoring Report Summary
Daily Data

Date	By-Pass Flow	INFLUENT														
		Flow	CBOD		TSS		TN		TKN		TP		Temp.	pH	Temp.
		MGD	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	deg. F		deg. C
1-Jan-12	0.00	0.756													
2-Jan-12	0.00	0.833			308								55.4	7.5	13.0
3-Jan-12	0.00	0.876			278								57.2	7.5	14.0
4-Jan-12	0.00	0.892	376	2797	318								57.2	7.4	14.0
5-Jan-12	0.00	0.878	347	2541	310								57.2	7.7	14.0
6-Jan-12	0.00	0.844			362	2548							59.0	7.6	15.0
25-Dec-19		1.304											55	7.3	
26-Dec-19		0.858											55	7.3	
27-Dec-19		1.429					28	334	28	334	7.2	86	55	7.3	
28-Dec-19		1.937													
29-Dec-19		1.930													
30-Dec-19		1.937			60	969							55	7.6	
31-Dec-19		1.912			84	1339							54	7.5	
2017 - 2019															
Count		1094.000	292	284	311	303	156	151	152	147	156	151	779	778	
Mean		1.889	266	3,586	343	4,761	28	397	29	399	7	96	62	7.35	
Max.		7.887	710	7,096	1,546	22,625	74	1,098	98	1,092	25	291	73	8.70	
99th perc.		5.344	612	6,509	1,153	14,547	68	920	67	845	16	248	72	7.82	
95th perc.		3.881	475	5,663	782	9,661	53	657	52	613	12	162	70	7.70	
90th perc.		3.065	432	4,942	566	8,164	47	550	48	525	11	145	70	7.60	
2012 - 2019															
Count		2,919	792	784	952	940	195	190	188	183	195	190	2,072	2,076	
Mean		1.544	287	3,103	342	3,696	28	396	29	396	7	94	61	7.42	
Max.		7.887	780	15,401	2,266	22,625	74	1,098	98	1,092	25	291	77	19.00	
99th perc.		5.108	672	6,228	994	12,769	66	890	66	841	16	224	72	8.23	
95th perc.		3.110	558	5,005	672	7,580	53	672	52	648	12	165	70	7.70	
90th perc.		2.517	485	4,427	564	6,037	47	550	47	532	11	145	70	7.60	

Date	Flow	CBOD		TSS		NH3-N		ZN		CD		Total Residual Chlorine		NO3-N		T
	MGD	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	mg/L
1-Jan-12																
2-Jan-12				20.0	0											
3-Jan-12				18.0	0	<1	0									
4-Jan-12		14	0	15.0	0											
5-Jan-12		17	0	20.0	0	<1	0									
6-Jan-12				17.0	0											
25-Dec-19	1.511					0.05	1									
26-Dec-19	1.606															
27-Dec-19	1.674															17.6
28-Dec-19	2.194															
29-Dec-19	2.149															
30-Dec-19	2.101			15	263	<1	<									
31-Dec-19	2.012			11	185	<1	<									
2017 - 2019																
Count	1,083	298	298	308	308	99	99	31	31	14	14	528	528	35	35	155
Mean	2.02	11	178	11	182	0.62	11.9	0.046	0.69	0.0075	0.14	0.0281	0.52	7.4	111	11.3
Max.	7.89	33	1,184	37	1,052	8.07	214.3	0.314	4.80	0.0200	0.54	0.3400	7.79	13.0	250	32.0
99th perc.	5.82	25	492	29	680	6.96	141.8	0.273	4.31	0.0200	0.53	0.3100	6.12	12.7	223	28.7
95th perc.	4.13	20	362	19	462	4.76	81.5	0.129	2.04	0.0200	0.50	0.0900	1.92	12.0	157	22.0
90th perc.	3.30	17	304	16	350	2.08	32.2	0.064	0.85	0.0200	0.45	0.0500	0.98	11.0	151	17.9
2012 - 2019																
Count	2,848	800	792	944	944	184	591	40	40	15	23	1,273	1,316	54	54	194
Mean	1.58	11	#VALUE!	15	177	2.02	6.2	0.048	0.69	0.0071	0.09	0.0254	0.38	6.4	93	12.0
Max.	12.00	66	#VALUE!	92	2,930	127.73	740.4	0.314	4.80	0.0200	0.54	0.6200	7.79	13.0	250	46.5
99th perc.	5.55	24	#VALUE!	50	898	13.70	126.0	0.298	4.16	0.0200	0.53	0.2300	4.85	12.6	208	31.6
95th perc.	3.37	21	#VALUE!	30	434	9.12	24.9	0.182	3.09	0.0200	0.47	0.0840	1.25	12.0	151	22.9
90th perc.	2.67	18	#VALUE!	24	299	4.71	5.5	0.066	0.86	0.0200	0.38	0.0600	0.83	11.0	145	18.2

EFFLUENT

Date	N	TP		AG		Temp.	CU		Tox Cer	Tox Pim	DO	pH	Fecal Coliform	Temp.	Weather Rainfall	Raw Sludge Gallons Pumped
	lbs/d	mg/L	lbs/d	mg/L	lbs/d	deg. F	mg/L	lbs/d			mg/L	SU	n/100mL	deg. C	in.	gpd
1-Jan-12															0.00	6187.0
2-Jan-12						50.0						7.3		10	0.00	0.0
3-Jan-12						51.8						7.3		11	0.00	3650.0
4-Jan-12						53.6						7.2		12	0.00	6129.0
5-Jan-12						55.4						7.5		13	0.00	3587.0
6-Jan-12						55.4						7.2		13	0.00	3740.0
25-Dec-19						54					7.8	7.3				
26-Dec-19						55					8.2	7.3				
27-Dec-19	246	5.3	74			55					8.2	7.3				
28-Dec-19																
29-Dec-19																
30-Dec-19						50					8.6	7.6				
31-Dec-19						50					9.2	7.5				

2017 - 2019

Count	155	155	155	21	21	754	35	35			772	774	42			
Mean	185	5.1	79	0.0062	0.10	53	0.0151	0.24			9.5	7.6	4,931			
Max.	514	11.0	244	0.0300	0.49	73	0.1050	1.68			12.6	11.0	24,000			
99th perc.	477	10.7	203	0.0276	0.44	70	0.0904	1.47			11.5	8.7	24,000			
95th perc.	375	9.5	134	0.0179	0.27	68	0.0326	0.71			11.1	8.0	24,000			
90th perc.	309	8.1	118	0.0100	0.27	66	0.0192	0.34			10.9	7.9	20,000			

2012 - 2019

Count	194	194	194	30	30	2,035	44	44			967	2,077	70	1,129	1,363	1,550
Mean	187	5.1	77	0.0054	0.09	57	0.0159	0.24			9.5	7.5	3,915	16	0.10	4873.80
Max.	514	11.8	244	0.0300	0.49	336	0.1050	1.68			12.6	11.0	30,000	169	3.25	18900.00
99th perc.	479	11.0	193	0.0265	0.42	73	0.1041	1.46			11.5	8.0	25,860	23	1.60	9925.32
95th perc.	373	9.8	126	0.0161	0.27	72	0.0557	0.98			11.1	7.9	24,000	22	0.61	7859.75
90th perc.	292	8.1	118	0.0104	0.24	70	0.0194	0.35			10.9	7.8	16,400	21	0.30	6898.50

Not on MOI

Date	Raw Sludge		RBC			Primary Digester				Process	Effluent	Influent	Effluent	Influent		
	Raw Sludge Total Solids %	Raw Sludge Volatile Solids %	RBC Dissolved Oxygen mg/L	RBC pH	RBC Temp. deg. C	Primary Digester Alkalinity mg/L	Primary Digester Temp. deg. F	Primary Digester Volatile Acids mg/L	Primary Digester pH	Recycle Flow MGD	Effluent after Final Clarifier mL/L	Influent Ammonia Nitrogen mg/L	Effluent Dissolved Oxygen mg/L	Influent TKN mg/L	Influent TKN lbs/d	Monthly Avg/Max TKN
1-Jan-12																
2-Jan-12	4	82.2	11	7.4	8	3,200	83.3	366.0	7	-	t		11			
3-Jan-12	4	82.4	13	7.4	8					-	t	21.6	12			
4-Jan-12			12	6.8	9	3,420	85.8	348.0	7	-	t		12			
5-Jan-12			11	7.5	10		86.0		7	-	t	22.0	11	38.1	279.0	
6-Jan-12			11	7.4	11		84.0		7	-	t		11			
25-Dec-19																
26-Dec-19																
27-Dec-19																
28-Dec-19																
29-Dec-19																
30-Dec-19																
31-Dec-19																
2017 - 2019																
Count																
Mean																
Max.																
99th perc.																
95th perc.																
90th perc.																
2012 - 2019																
Count	443	443	1,076	1,106	1,106	514	1,246	525	1,247	296	173	423	1,029	216	101	48
Mean	3.64	77.48	9.58	8.21	14.48	3591.40	90.02	489.09	8.12	0.34	0.01	16.12	9.09	36.44	367.32	50.73
Max.	8.19	92.79	802.00	705.00	123.00	4960.00	104.00	2220.00	605.00	1.33	0.50	36.00	12.70	109.80	1172.72	109.80
99th perc.	6.88	87.18	12.30	8.20	23.00	4794.80	99.00	1631.04	7.60	1.01	0.20	31.02	12.30	75.33	1043.93	100.21
95th perc.	4.97	85.66	11.50	7.90	22.00	4500.00	97.00	1155.20	7.30	0.61	0.00	28.83	11.60	63.88	546.76	74.59
90th perc.	4.47	84.71	10.95	7.90	21.00	4374.00	95.00	900.00	7.30	0.52	0.00	27.53	11.20	55.60	488.15	69.83

Date	
1-Jan-12	
2-Jan-12	
3-Jan-12	
4-Jan-12	
5-Jan-12	
6-Jan-12	
25-Dec-19	
26-Dec-19	
27-Dec-19	
28-Dec-19	
29-Dec-19	
30-Dec-19	
31-Dec-19	

2017 - 2019

Count	
Mean	
Max.	
99th perc.	
95th perc.	
90th perc.	

2012 - 2019

Count	48
Mean	433.36
Max.	1172.72
99th perc.	1112.19
95th perc.	650.24
90th perc.	565.24

Not included on MOR

Date	Custom Meats										
	Flow	CBOD		TSS		TKN		O & G		pH	Temp.
	MGD	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d		deg. C
1-Jan-12	0.002										
2-Jan-12	0.002										
3-Jan-12	0.005										
4-Jan-12	0.028	329	76	35	8	42	10	7	2	6.9	18.0
5-Jan-12	0.044										
6-Jan-12	0.029										
25-Dec-19	0.006										
26-Dec-19	0.005										
27-Dec-19	0.039	860	279	96	31	35	11	16	5.1832099	8.36	
28-Dec-19	0.034										
29-Dec-19	0.001										
30-Dec-19	0.003										
31-Dec-19	0.034										

2017 - 2019

Count	1,095	168	168	168	168	168	168	168	168	161	
Mean	0.04	635	269	74	37	31	15	38	19	8.6	
Max.	0.42	6,400	1,967	400	350	204	121	581	318	13.0	
99th perc.	0.12	3,633	1,402	356	217	153	78	234	149	12.4	
95th perc.	0.10	2,013	1,015	305	166	97	62	137	69	10.6	
90th perc.	0.08	1,400	656	183	108	74	42	103	50	10.0	

2012 - 2019

Count	2,922	426	426	427	427	427	427	354	354	415	250
Mean	0.04	533	222	63	28	27	12	27	12	7.8	21
Max.	0.42	6,400	1,967	400	350	204	121	581	318	13.1	28
99th perc.	0.11	2,995	1,303	349	199	142	68	178	100	12.2	27
95th perc.	0.09	1,575	695	189	95	71	41	105	50	10.6	26
90th perc.	0.07	1,189	509	140	59	53	24	58	27	9.8	25

Does not include results when san
completed on different days for th
industries

Date	Mary Ann's Deli Foods, Inc.												Total Industries		
	Flow	CBOD		TSS		TKN		O & G		pH	Temp.		Flow	CBOD	TSS
	MGD	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d	mg/L	lbs/d		deg. C		MGD	lbs/d	lbs/d
1-Jan-12	0.000														
2-Jan-12	0.000														
3-Jan-12	0.012														
4-Jan-12	0.014	762	90	163	19	19	2	121	14.2	7.9	17.0		0.042	166	27
5-Jan-12	0.014														
6-Jan-12	0.012														
25-Dec-19	0.006														
26-Dec-19	0.022														
27-Dec-19	0.031	760	197	260	67	52	13	625	161.9837	6.7			0.070	476	98
28-Dec-19	0.027														
29-Dec-19	0.023														
30-Dec-19	0.030														
31-Dec-19	0.011														
2017 - 2019															
Count	1,095	167	167	167	167	167	167	167	167	164			162	162	162
Mean	0.024	821	201	145	36	67	17	55	14	7.5			0.084	477	73
Max.	0.347	3,100	3,027	1,700	810	220	304	1,436	347	11.9			0.418	3,669	846
99th perc.	0.041	2,368	670	795	216	187	50	737	178	11.6			0.152	1,931	312
95th perc.	0.036	1,670	440	401	105	150	39	164	41	10.4			0.126	1,205	223
90th perc.	0.034	1,530	334	280	59	130	31	107	25	9.4			0.115	948	163
2012 - 2019															
Count	2,921	426	426	425	424	426	426	411	411	414	249		400	399	399
Mean	0.023	747	183	202	49	59	15	130	30	7.1	20		0.081	408	78
Max.	0.347	4,690	3,027	1,700	810	286	304	3,436	851	11.9	28		0.418	3,669	846
99th perc.	0.040	2,816	745	1,081	262	224	65	1,428	339	11.6	27		0.151	1,619	291
95th perc.	0.036	1,948	478	653	163	160	40	462	112	10.3	25		0.125	1,000	224
90th perc.	0.034	1,500	358	410	107	120	29	287	69	9.2	25		0.112	766	166

ıpling was
e

Date	TKN lbs/d
1-Jan-12	
2-Jan-12	
3-Jan-12	
4-Jan-12	12
5-Jan-12	
6-Jan-12	
25-Dec-19	
26-Dec-19	
27-Dec-19	25
28-Dec-19	
29-Dec-19	
30-Dec-19	
31-Dec-19	

2017 - 2019

Count	162
Mean	32
Max.	329
99th perc.	115
95th perc.	79
90th perc.	60

2012 - 2019

Count	400
Mean	27
Max.	329
99th perc.	96
95th perc.	69
90th perc.	53

Table B.2 Monthly Monitoring Data Summary

City of Webster City
Wastewater Plant Load Summary
Monthly Data Summary

Calculated from MOR

Year	Month	Treatment Plant Influent Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/day	Average TKN lbs/day	Max TP lbs/day	Average TP lbs/day
	2017-19										
	Average	3.409	1.886	5,175	3,601	8,629	4,844	523	398	138	97
	Maximum	7.887	3.439	7,096	4,848	22,625	8,813	1,092	600	291	162
	90th Perctl	7.268	3.047	6,491	4,327	13,907	7,564	795	487	198	129
	95th Perctl	7.446	3.268	6,671	4,467	15,732	8,242	840	522	232	135
	99th Pertl	7.758	3.382	7,057	4,721	20,271	8,788	1,008	574	286	156
	Minimum										
	2012-19										
	Average	2.737	1.543	4,509	3,123	6,960	3,750	480	361	138	97
	Maximum	7.887	3.439	15,401	4,848	22,625	8,813	1,173	600	291	162
	90th Perctl	6.066	2.564	6,157	4,107	12,055	5,796	657	475	197	131
	95th Perctl	7.265	2.964	6,514	4,324	14,846	6,954	837	494	226	134
	99th Pertl	7.833	3.283	7,511	4,678	21,598	8,746	1,096	541	286	156
	Minimum										

	Custom Meats Discharge								Mary Anns Discharge							
Month	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day
2017-19																
Average	0.082	0.041	549	265	71	35	27	13	0.040	0.023	284	189	67	32	25	15
Maximum	0.130	0.080	1,967	853	350	124	121	50	0.197	0.031	749	477	249	123	53	41
90th Perctl	0.122	0.063	1,229	580	172	95	65	30	0.042	0.028	451	309	167	56	41	25
95th Perctl	0.125	0.069	1,401	625	216	104	74	37	0.046	0.028	505	366	180	67	44	27
99th Pertl	0.130	0.079	1,772	780	304	123	110	49	0.147	0.030	707	441	232	105	51	36
Minimum																
2012-19																
Average	0.076	0.037	432	218	52	27	22	11	0.036	0.023	302	176	100	48	24	14
Maximum	0.139	0.080	1,967	853	350	124	121	50	0.197	0.036	1,455	687	409	172	88	45
90th Perctl	0.108	0.057	1,017	462	110	53	47	22	0.042	0.029	563	306	241	89	43	25
95th Perctl	0.123	0.066	1,157	563	138	86	64	30	0.046	0.031	710	394	257	121	53	30
99th Pertl	0.130	0.079	1,836	693	225	120	98	47	0.061	0.034	945	538	363	136	85	44
Minimum																

	Vero Blue Discharge								Total Custom Meat + Mary Anns + Vero Blue							
Month	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day
2017-19																
Average	0.266	1.417	172	84	680	301	96	32	0.281	0.152	934	503	534	242	108	47
Maximum	0.806	28.000	1,601	451	7,574	2,790	770	202	0.901	0.338	2,360	1,122	7,601	2,811	787	213
90th Perctl	0.377	0.265	336	287	923	409	260	79	0.468	0.305	1,649	743	823	443	135	71
95th Perctl	0.402	0.282	466	355	1,012	553	657	172	**0.493**	0.319	1,798	905	**1,039**	**559**	**383**	117
99th Pertl	0.721	22.179	1,374	432	6,262	2,343	747	196	0.763	**0.332**	2,184	**1,062**	5,355	2,058	750	**203**
Minimum																
2012-19																
Average	0.266	1.417	172	84	680	301	96	32	0.172	0.093	772	412	301	141	67	32
Maximum	0.806	28.000	1,601	451	7,574	2,790	770	202	0.901	0.338	2,426	1,122	7,601	2,811	787	213
90th Perctl	0.377	0.265	336	287	923	409	260	79	0.399	0.245	1,541	717	537	261	106	55
95th Perctl	0.402	0.282	466	355	1,012	553	657	172	0.454	0.292	1,792	878	787	383	135	63
99th Pertl	0.721	22.179	1,374	432	6,262	2,343	747	196	0.525	0.323	2,363	960	1,505	768	686	186
Minimum																

Population: 7,814

	Residential/Commercial Loads (Calculated)				Per Capita Res/Comm. Loads				AWW I/I Calculation			MWW I/I Calculation			
Month	Average Flow (Inc. I/I) MGD	Average CBOD lbs/day	Average TSS lbs/day	Average TKN lbs/day	Average Flow (Inc. I/I) gal/c/d	Average CBOD lbs/c/d	Average TSS lbs/c/d	Average TKN lbs/c/d	Average Res + I/I MGD	Average Res Dry Weather MGD	I/I Calc. MGD	Max MGD	Avg Industrial MGD	Average Res Dry Weather MGD	Max I/I
2017-19															
Average	1.734	3,099	4,602	351	222	0.40	0.59	0.045	1.734	0.719	1.015	3.409	0.152	0.719	2.537
Maximum	3.316	4,433	8,766	548	424	0.57	1.12	0.070	3.316	0.719	2.597	7.887	0.338	0.719	7.009
90th Perctl	2.845	3,768	7,474	437	364	0.48	0.96	0.056	2.845	0.719	2.126	7.268	0.305	0.719	6.426
95th Perctl	3.167	3,885	7,948	469	405	0.50	1.02	0.060	3.167	0.719	2.448	7.446	0.319	0.719	6.558
99th Pertl	3.285	4,243	8,603	526	420	0.54	1.10	0.067	3.285	0.719	2.567	7.758	0.332	0.719	6.920
Minimum	0.776														
2012-19															
Average	1.450	2,711	3,609	329	186	0.35	0.46	0.042	1.450	0.719	0.731	2.737	0.093	0.719	1.926
Maximum	3.316	4,433	8,766	548	424	0.57	1.12	0.070	3.316	0.719	2.597	7.887	0.338	0.719	7.061
90th Perctl	2.437	3,692	5,641	433	312	0.47	0.72	0.055	2.437	0.719	1.718	6.066	0.245	0.719	5.256
95th Perctl	2.715	3,798	6,913	467	347	0.49	0.88	0.060	2.715	0.719	1.996	7.265	0.292	0.719	6.395
99th Pertl	3.233	4,221	8,323	521	414	0.54	1.07	0.067	3.233	0.719	2.514	7.833	0.323	0.719	7.012
Minimum	0.719														

Table B.2 Monthly Monitoring Data Summary

City of Webster City
Wastewater Plant Load Summary
Monthly Data Summary

Calculated from MOR

		Treatment Plant Influent									
Year	Month	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/day	Average TKN lbs/day	Max TP lbs/day	Average TP lbs/day
2012	Jan 12	0.988	0.849	3,462	2,986	5,003	3,448	320	298		
2012	Feb	1.258	0.847	6,715	2,904	8,393	3,256	429	249		
2012	Mar	1.210	1.063	4,900	4,168	6,471	4,408	653	468		
2012	Apr	1.603	1.090	6,122	2,883	21,544	4,122	1,044	496		
2012	May	2.746	1.335	4,941	3,429	9,069	3,699	632	341		
2012	Jun	1.359	0.956	3,971	3,139	5,911	3,523	339	324		
2012	Jul	1.627	0.859	5,156	2,868	5,674	3,261	537	392		
2012	Aug	1.700	0.884	3,169	2,351	16,843	3,568	347	328		
2012	Sep	1.011	0.821	3,082	2,468	6,693	2,931	355	268		
2012	Oct	1.169	0.892	5,818	3,524	4,907	3,561	522	450		
2012	Nov	0.976	0.911	5,141	4,260	5,345	3,150	400	379		
2012	Dec	0.939	0.853	5,965	3,909	4,003	2,848	501	418		
2013	Jan 13	1.066	0.799	3,257	2,902	2,992	2,516	382	346		
2013	Feb	0.994	0.822	4,856	3,835	5,268	3,322	390	353		
2013	Mar	2.040	1.097	3,931	3,274	3,795	2,871	414	305		
2013	Apr	4.966	2.106	3,861	2,525	5,053	2,652	1,173	473		
2013	May	6.542	3.273	4,504	3,106	4,387	2,740	417	319		
2013	Jun	4.684	2.225	3,083	2,238	12,423	3,780	334	288		
2013	Jul	1.830	1.193	4,102	3,238	4,385	3,408	419	356		
2013	Aug	1.029	0.851	5,336	3,719	6,445	4,237	645	487		
2013	Sep	1.123	0.795	3,010	2,315	4,037	2,386	362	330		
2013	Oct	1.416	0.802	4,048	3,469	4,869	3,008	477	402		
2013	Nov	1.057	0.812	5,863	3,660	7,121	3,135	512	394		
2013	Dec	0.851	0.771	4,304	2,970	4,948	2,818	419	319		
2014	Jan 14	0.865	0.768	4,457	2,534	3,536	2,133	395	317		
2014	Feb	0.969	0.784	3,504	2,818	4,004	2,423	377	326		
2014	Mar	1.660	0.949	3,447	2,997	4,818	3,054	585	375		
2014	Apr	1.962	1.128	6,030	3,170	6,271	2,983	334	293		
2014	May	4.967	1.652	3,143	2,113	10,522	3,364	398	265		
2014	Jun	5.900	1.876	3,620	2,287	6,987	3,492	641	282		
2014	Jul	5.900	1.801	15,401	3,548	3,279	2,275	510	298		
2014	Aug	1.523	1.062	2,667	2,244	2,908	1,870	326	276		
2014	Sep	1.533	1.276	2,607	2,285	2,244	1,789	296	250		
2014	Oct	1.811	1.378	4,243	2,721	4,970	3,144	486	317		
2014	Nov	1.201	1.062	5,675	4,669	5,300	3,769	399	368		
2014	Dec	1.415	1.115	5,882	4,084	5,521	3,498	458	407		
2015	Jan 15	1.278	1.148	2,705	2,184	5,050	2,973	305	274		
2015	Feb	1.229	1.054	2,589	2,201	5,332	3,382	355	320		
2015	Mar	1.323	1.099	2,426	2,213	3,860	2,780	373	318		

Table B.2 Monthly Monitoring Data Summary

City of Webster City
Wastewater Plant Load Summary
Monthly Data Summary

Calculated from MOR

		Treatment Plant Influent									
Year	Month	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/day	Average TKN lbs/day	Max TP lbs/day	Average TP lbs/day
2015	Apr	1.866	1.426	3,472	2,326	3,193	2,289	395	288		
2015	May	2.823	2.019	2,378	2,098	5,616	2,626	469	312		
2015	Jun	2.342	1.608	2,390	1,745	4,287	2,550	504	289		
2015	Jul	1.587	1.203	3,258	2,394	12,415	5,006	391	281		
2015	Aug	7.830	2.009	2,972	2,310	3,780	2,706	414	286		
2015	Sep	3.090	1.622	3,488	2,544	4,675	3,154	407	284		
2015	Oct	1.238	1.090	3,656	2,960	6,539	4,168	419	367		
2015	Nov	2.048	1.250	3,884	3,011	8,608	4,880	456	428		
2015	Dec	6.170	2.580	2,753	1,923	3,431	2,609	372	254		
2016	Jan 16	2.513	1.786	2,976	2,193	3,364	2,014	273	230		
2016	Feb	3.060	1.910	3,322	2,590	3,789	2,797	324	268		
2016	Mar	2.581	2.003	2,517	2,417	4,869	3,078	240	222		
2016	Apr	2.311	1.656	3,356	2,265	3,235	2,235	297	267		
2016	May	2.137	1.727	2,708	2,160	3,777	2,398	412	288		
2016	Jun	2.893	1.809	4,545	2,175	2,341	1,539	314	277		
2016	Jul	2.057	1.278	2,828	2,001	7,640	3,232	312	312		
2016	Aug	3.599	1.552	2,740	2,113	12,332	3,877	471	317		
2016	Sep	6.453	2.547	3,423	2,659	5,792	2,728	839	538		
2016	Oct	2.539	1.554	4,080	3,403	6,304	3,079	539	436		
2016	Nov	1.387	1.185	3,794	3,244	5,414	3,420	661	493	167	132
2016	Dec	1.839	1.310	5,031	3,448	5,923	3,660	515	452	116	92
2017	Jan 17	1.836	1.328	4,388	2,825	4,554	3,180	582	410	110	63
2017	Feb	3.321	1.717	4,582	3,708	5,096	3,865	452	396	104	70
2017	Mar	4.122	2.646	6,566	4,321	5,432	3,385	760	490	129	94
2017	Apr	4.203	2.581	4,001	3,064	4,252	3,061	457	415	103	84
2017	May	3.975	2.378	4,244	3,340	4,894	3,359	500	389	96	80
2017	Jun	1.789	1.351	4,153	3,269	9,554	5,670	413	402	83	77
2017	Jul	1.697	1.063	6,270	3,196	7,190	3,984	454	352	111	57
2017	Aug	1.350	1.061	5,762	3,271	7,332	4,109	435	320	97	69
2017	Sep	1.277	1.051	6,111	4,486	14,570	8,743	852	600	217	114
2017	Oct	2.697	1.444	4,472	3,632	9,294	4,016	480	452	139	104
2017	Nov	1.294	1.164	5,087	4,332	5,119	4,279	612	526	95	29
2017	Dec	1.165	1.049	4,941	3,111	4,288	2,724	544	484	15	9
2018	Jan 18	1.803	1.210	4,762	3,381	6,505	3,470	436	396	20	14
2018	Feb	1.825	1.211	5,220	3,776	5,952	3,949	473	391	144	111
2018	Mar	2.791	1.753	4,739	3,678	8,740	4,378	415	317	131	111
2018	Apr	4.753	2.717	4,615	3,859	8,173	6,230	416	383	139	119
2018	May	2.823	2.160	5,122	3,371	9,663	6,192	370	348	135	126
2018	Jun	7.421	2.880	6,192	3,917	10,432	5,707	805	404	278	146

Table B.2 Monthly Monitoring Data Summary

City of Webster City
Wastewater Plant Load Summary
Monthly Data Summary

Calculated from MOR

Year	Month	Treatment Plant Influent Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/day	Average TKN lbs/day	Max TP lbs/day	Average TP lbs/day
2018	Jul	3.646	1.841	4,736	3,387	7,980	4,680	401	353	137	106
2018	Aug	6.956	2.237	6,497	3,877	22,625	8,075	613	398	195	121
2018	Sep	5.962	3.439	6,984	4,096	11,778	7,708	611	340	196	117
2018	Oct	7.887	3.265	7,096	4,848	15,899	8,813	338	249	120	105
2018	Nov	2.259	1.736	6,406	3,944	15,677	7,421	517	410	142	106
2018	Dec	2.944	1.563	5,710	3,709	11,295	6,798	786	476	187	121
2019	Jan 19	1.850	1.386	3,561	2,659	7,788	3,899	344	301	116	82
2019	Feb	1.508	1.235	4,647	3,138	8,610	3,951	491	448	160	122
2019	Mar	7.262	2.161	5,732	4,117	10,096	5,886	392	375	119	101
2019	Apr	3.143	2.179	5,377	4,460	8,954	6,273	547	406	156	117
2019	May	7.519	3.275	3,615	2,650	4,880	3,603	379	361	118	91
2019	Jun	2.973	2.112	4,460	3,176	6,602	4,606	342	324	90	75
2019	Jul	1.886	1.384	5,957	4,119	13,245	5,206	403	339	134	99
2019	Aug	2.180	1.210	6,484	3,746	7,835	3,886	836	406	200	112
2019	Sep	2.496	1.434	3,787	2,991	4,410	2,811	372	337	140	102
2019	Oct	7.274	3.214	4,801	3,244	8,515	4,742	1,092	520	291	162
2019	Nov	2.282	1.687	4,840	3,727	6,940	3,465	479	433	165	131
2019	Dec	2.538	1.782	4,381	3,221	6,478	2,248	428	386	146	131
	2017-19										
	Average	3.409	1.886	5,175	3,601	8,629	4,844	523	398	138	97
	Maximum	7.887	3.439	7,096	4,848	22,625	8,813	1,092	600	291	162
	90th Perctl	7.268	3.047	6,491	4,327	13,907	7,564	795	487	198	129
	95th Perctl	7.446	3.268	6,671	4,467	15,732	8,242	840	522	232	135
	99th Pertl	7.758	3.382	7,057	4,721	20,271	8,788	1,008	574	286	156
	Minimum										
	2012-19										
	Average	2.737	1.543	4,509	3,123	6,960	3,750	480	361	138	97
	Maximum	7.887	3.439	15,401	4,848	22,625	8,813	1,173	600	291	162
	90th Perctl	6.066	2.564	6,157	4,107	12,055	5,796	657	475	197	131
	95th Perctl	7.265	2.964	6,514	4,324	14,846	6,954	837	494	226	134
	99th Pertl	7.833	3.283	7,511	4,678	21,598	8,746	1,096	541	286	156

	Custom Meats Discharge								Mary Anns Discharge							
Month	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day
Jan 12	0.057	0.021	76	47	18	10	10	8	0.025	0.010	182	114	70	42	12	6
Feb	0.057	0.025	67	57	33	25	16	12	0.036	0.024	310	158	164	78	12	9
Mar	0.067	0.038	131	100	47	29	25	21	0.035	0.028	215	128	89	65	15	10
Apr	0.046	0.019	106	72	30	22	10	9	0.046	0.019	106	72	30	22	10	9
May	0.066	0.027	428	287	58	41	20	17	0.034	0.024	139	77	81	52	12	6
Jun	0.069	0.028	292	132	70	58	38	15	0.032	0.023	276	126	120	49	7	6
Jul	0.068	0.027	256	163	54	32	22	14	0.040	0.026	468	171	73	52	33	13
Aug	0.064	0.033	454	260	98	52	18	13	0.042	0.029	164	90	111	58	19	11
Sep	0.053	0.024	170	84	14	10	20	6	0.041	0.020	139	73	78	40	11	5
Oct	0.093	0.040	471	248	63	41	32	21	0.048	0.032	709	344	264	135	45	24
Nov	0.093	0.059	440	248	61	42	27	20	0.037	0.030	734	447	277	120	54	31
Dec	0.082	0.034	432	262	52	27	32	17	0.035	0.023	193	138	206	72	25	13
Jan 13	0.046	0.023	79	55	24	12	12	7	0.032	0.019	175	158	69	56	17	13
Feb	0.077	0.030	499	238	42	27	13	8	0.031	0.019	344	194	87	61	25	16
Mar	0.059	0.026	235	199	125	47	11	9	0.031	0.018	303	202	141	80	21	15
Apr	0.053	0.022	272	157	12	9	8	6	0.026	0.017	245	137	137	54	19	12
May	0.089	0.031	1,070	513	18	13	35	18	0.032	0.020	547	183	409	82	49	17
Jun	0.088	0.023	230	134	17	10	14	7	0.031	0.019	246	137	98	65	39	17
Jul	0.045	0.021	422	238	28	14	14	8	0.030	0.019	178	99	58	42	14	8
Aug	0.051	0.027	108	92	14	8	8	5	0.031	0.020	151	81	61	37	11	7
Sep	0.065	0.025	272	198	36	17	14	10	0.032	0.020	159	134	68	57	16	12
Oct	0.077	0.036	519	256	27	16	20	12	0.036	0.026	580	285	161	94	44	25
Nov	0.118	0.060	703	481	34	21	48	25	0.032	0.022	259	175	250	127	19	15
Dec	0.066	0.035	1,829	684	96	46	97	30	0.029	0.017	597	248	255	86	29	13
Jan 14	0.060	0.026	279	157	18	10	10	6	0.026	0.016	59	82	21	18	8	4
Feb	0.047	0.023	291	179	22	12	8	7	0.026	0.016	479	131	177	111	38	24
Mar	0.092	0.034	376	215	14	9	20	12	0.028	0.020	506	320	166	89	38	25
Apr	0.059	0.031	371	149	68	18	15	7	0.026	0.018	393	134	134	43	24	11
May	0.046	0.024	263	137	15	6	5	4	0.029	0.016	252	126	160	63	20	10
Jun	0.044	0.021	189	130	22	11	11	6	0.031	0.018	140	74	56	28	13	6
Jul	0.050	0.025	229	193	78	25	20	9	0.029	0.018	400	177	240	82	19	11
Aug	0.049	0.025	416	196	29	18	11	7	0.027	0.017	145	94	35	28	6	6
Sep	0.065	0.026	291	143	31	16	8	5	0.027	0.017	188	111	81	39	16	8
Oct	0.083	0.040	167	125	34	22	13	8	0.032	0.024	361	205	70	33	29	15
Nov	0.079	0.048	519	251	36	21	16	11	0.033	0.023	328	208	90	49	30	17
Dec	0.118	0.056	413	229	53	23	41	17	0.023	0.022	138	103	71	39	15	9
Jan 15	0.073	0.026	238	115	15	11	7	5	0.046	0.018	127	82	35	24	11	7
Feb	0.062	0.030	138	84	24	17	12	6	0.033	0.023	161	131	62	41	12	10
Mar	0.074	0.038	60	45	14	11	9	8	0.031	0.023	399	178	173	79	18	10

	Custom Meats Discharge								Mary Anns Discharge							
Month	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day
Apr	0.060	0.028	87	34	19	7	12	6	0.029	0.019	120	71	35	18	8	5
May	0.074	0.038	47	31	13	7	9	7	0.032	0.019	326	166	86	35	29	12
Jun	0.074	0.026	63	32	5	3	5	4	0.036	0.022	338	170	52	33	29	15
Jul	0.067	0.032	263	121	57	17	16	8	0.031	0.021	122	83	51	22	11	6
Aug	0.060	0.028	245	93	29	17	7	5	0.032	0.022	380	243	98	64	43	18
Sep	0.071	0.033	380	219	39	27	12	7	0.037	0.025	1,455	687	361	172	85	39
Oct	0.098	0.048	1,050	397	132	67	51	23	0.038	0.031	918	477	255	129	88	44
Nov	0.096	0.057	341	191	52	35	16	11	0.040	0.031	714	530	134	104	68	45
Dec	0.106	0.056	404	265	44	29	16	9	0.035	0.026	253	94	37	16	6	5
Jan 16	0.077	0.027	298	190	39	22	9	6	0.032	0.021	280	143	94	45	17	8
Feb	0.089	0.039	886	500	48	29	25	12	0.039	0.024	113	58	50	29	11	6
Mar	0.078	0.040	601	310	60	33	12	9	0.038	0.025	120	75	111	37	9	5
Apr	0.055	0.030	597	284	49	35	13	7	0.031	0.020	194	94	54	31	13	7
May	0.063	0.026	271	101	45	21	10	4	0.033	0.022	171	92	278	86	10	7
Jun	0.061	0.032	729	311	45	26	13	7	0.035	0.024	39	18	16	6	4	2
Jul	0.068	0.033	75	53	29	11	4	3	0.037	0.023	134	61	101	34	10	5
Aug	0.081	0.040	363	139	71	25	13	5	0.039	0.027	91	47	16	12	6	3
Sep	0.103	0.043	292	149	27	16	24	10	0.041	0.029	192	122	63	31	17	9
Oct	0.101	0.052	602	275	53	31	20	14	0.047	0.036	429	267	46	39	21	16
Nov	0.123	0.079	135	66	21	7	15	9	0.044	0.034	610	281	243	89	77	30
Dec	0.139	0.070	155	71	30	18	9	6	0.040	0.030	327	183	71	47	30	18
Jan 17	0.066	0.032	148	50	47	12	20	8	0.040	0.020	190	125	39	27	15	10
Feb	0.079	0.036	74	41	20	10	17	9	0.035	0.021	226	114	45	27	18	9
Mar	0.096	0.044	1,041	444	187	94	121	50	0.023	0.018	226	117	41	26	14	11
Apr	0.098	0.042	1,411	613	215	124	67	33	0.027	0.015	133	101	28	16	17	9
May	0.064	0.033	405	148	38	31	18	9	0.032	0.021	173	150	45	35	12	9
Jun	0.078	0.041	73	43	14	10	7	5	0.036	0.024	262	212	59	38	40	24
Jul	0.106	0.038	42	26	23	8	6	3	0.026	0.011	51	33	13	7	3	2
Aug	0.109	0.048	669	331	219	97	59	28	0.037	0.025	457	204	86	47	40	17
Sep	0.066	0.038	190	93	37	19	6	5	0.044	0.030	629	363	166	65	37	26
Oct	0.082	0.049	642	239	49	24	25	14	0.037	0.028	303	199	81	33	31	19
Nov	0.123	0.080	462	250	350	120	68	30	0.035	0.028	180	141	46	18	18	14
Dec	0.124	0.066	1,397	853	157	98	91	47	0.034	0.024	163	130	16	9	10	9
Jan 18	0.080	0.032	650	547	111	83	30	21	0.031	0.022	126	91	107	55	6	4
Feb	0.096	0.047	152	102	23	17	5	4	0.033	0.023	202	136	88	44	12	7
Mar	0.080	0.044	34	24	15	11	5	4	0.033	0.023	222	189	12	10	19	12
Apr	0.061	0.033	182	113	18	12	6	4	0.029	0.019	146	78	12	10	6	4
May	0.063	0.035	491	246	23	12	7	5	0.032	0.022	263	166	44	21	10	7
Jun	0.064	0.034	648	269	51	23	14	6	0.029	0.021	156	124	42	25	9	6

Month	Custom Meats Discharge Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day	Mary Anns Discharge Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day
Jul	0.098	0.029	1,085	436	32	19	27	13	0.041	0.023	349	235	199	54	37	22
Aug	0.072	0.037	1,967	645	108	40	50	23	0.035	0.026	368	291	173	56	43	28
Sep	0.070	0.040	444	205	27	21	22	8	0.032	0.024	376	256	108	48	33	22
Oct	0.129	0.067	53	33	9	7	3	2	0.031	0.024	431	376	54	33	37	26
Nov	0.121	0.076	182	48	73	19	15	4	0.038	0.027	749	477	169	71	53	41
Dec	0.130	0.056	48	14	33	11	34	9	0.042	0.031	444	286	20	10	42	19
Jan 19	0.061	0.029	197	87	25	15	7	4	0.197	0.026	325	214	78	32	21	17
Feb	0.051	0.027	230	214	28	17	6	5	0.035	0.022	261	196	44	28	31	22
Mar	0.051	0.034	301	167	16	11	7	5	0.024	0.017	282	184	35	22	21	15
Apr	0.046	0.028	1,004	426	109	36	41	17	0.027	0.023	247	143	21	10	19	8
May	0.043	0.024	249	166	27	12	22	13	0.034	0.022	217	125	22	14	19	9
Jun	0.051	0.026	311	237	39	20	7	5	0.054	0.022	300	167	52	21	21	14
Jul	0.059	0.026	344	198	34	18	6	5	0.041	0.028	274	152	29	17	20	13
Aug	0.050	0.027	1,030	618	42	34	18	13	0.038	0.027	201	125	33	14	23	10
Sep	0.071	0.028	833	414	113	55	19	9	0.041	0.028	239	193	28	18	29	23
Oct	0.096	0.040	1,372	344	84	26	63	15	0.042	0.028	333	211	102	39	39	20
Nov	0.103	0.061	829	490	120	59	45	30	0.041	0.026	249	163	22	14	48	22
Dec	0.103	0.042	589	372	35	25	25	17	0.040	0.025	463	326	249	123	28	21
2017-19																
Average	0.082	0.041	549	265	71	35	27	13	0.040	0.023	284	189	67	32	25	15
Maximum	0.130	0.080	1,967	853	350	124	121	50	0.197	0.031	749	477	249	123	53	41
90th Perctl	0.122	0.063	1,229	580	172	95	65	30	0.042	0.028	451	309	167	56	41	25
95th Perctl	0.125	0.069	1,401	625	216	104	74	37	0.046	0.028	505	366	180	67	44	27
99th Pertl	0.130	0.079	1,772	780	304	123	110	49	0.147	0.030	707	441	232	105	51	36
Minimum																
2012-19																
Average	0.076	0.037	432	218	52	27	22	11	0.036	0.023	302	176	100	48	24	14
Maximum	0.139	0.080	1,967	853	350	124	121	50	0.197	0.036	1,455	687	409	172	88	45
90th Perctl	0.108	0.057	1,017	462	110	53	47	22	0.042	0.029	563	306	241	89	43	25
95th Perctl	0.123	0.066	1,157	563	138	86	64	30	0.046	0.031	710	394	257	121	53	30
99th Pertl	0.130	0.079	1,836	693	225	120	98	47	0.061	0.034	945	538	363	136	85	44

	Vero Blue Discharge								Total Custom Meat + Mary Anns + Vero Blue							
Month	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day
Jan 12									0.082	0.031	258	161	88	51	22	14
Feb									0.092	0.049	377	215	196	102	28	21
Mar									0.102	0.066	345	229	136	94	39	31
Apr									0.091	0.038	212	143	61	45	21	18
May									0.100	0.052	567	364	139	93	32	23
Jun									0.101	0.051	568	258	189	107	45	21
Jul									0.108	0.053	724	334	127	85	55	27
Aug									0.106	0.062	617	351	210	109	37	24
Sep									0.094	0.044	308	157	92	50	30	12
Oct									0.141	0.071	1,180	592	327	176	77	45
Nov									0.131	0.088	1,174	695	338	162	81	51
Dec									0.117	0.057	624	400	258	99	57	30
Jan 13									0.078	0.042	254	212	93	68	29	20
Feb									0.109	0.049	843	433	129	88	38	24
Mar									0.090	0.044	538	402	266	128	32	25
Apr									0.079	0.040	516	295	149	63	27	18
May									0.122	0.051	1,617	697	427	95	84	35
Jun									0.118	0.042	476	271	115	75	53	24
Jul									0.075	0.040	600	337	86	56	28	16
Aug									0.081	0.047	258	173	75	45	19	12
Sep									0.097	0.045	431	333	104	73	30	22
Oct									0.113	0.062	1,099	540	188	111	63	37
Nov									0.150	0.082	962	656	285	148	67	39
Dec									0.095	0.052	2,426	932	351	132	126	42
Jan 14									0.086	0.042	338	239	39	28	18	10
Feb									0.073	0.039	770	310	199	123	46	31
Mar									0.120	0.054	882	536	180	98	58	37
Apr									0.085	0.049	764	283	202	61	39	18
May									0.075	0.040	515	262	175	69	25	14
Jun									0.075	0.039	329	204	78	39	24	12
Jul									0.079	0.043	629	371	318	107	39	20
Aug									0.076	0.042	561	290	64	46	17	13
Sep									0.092	0.043	479	254	112	55	24	13
Oct									0.115	0.064	528	331	104	55	42	23
Nov									0.112	0.071	847	459	126	70	46	28
Dec									0.141	0.078	551	332	124	62	56	26
Jan 15									0.119	0.044	365	197	50	35	18	12
Feb									0.095	0.053	299	215	86	58	24	16
Mar									0.105	0.061	459	223	187	90	27	18

	Vero Blue Discharge								Total Custom Meat + Mary Anns + Vero Blue							
Month	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day
Apr									0.089	0.047	207	105	54	25	20	11
May									0.106	0.057	373	197	99	42	38	19
Jun									0.110	0.048	401	202	57	36	34	19
Jul									0.098	0.053	385	204	108	39	27	14
Aug									0.092	0.050	625	336	127	81	50	23
Sep									0.108	0.058	1,835	906	400	199	97	46
Oct									0.136	0.079	1,968	874	387	196	139	67
Nov									0.136	0.088	1,055	721	186	139	84	56
Dec									0.141	0.082	657	359	81	45	22	14
Jan 16									0.109	0.048	578	333	133	67	26	14
Feb									0.128	0.063	999	558	98	58	36	18
Mar									0.116	0.065	721	385	171	70	21	14
Apr									0.086	0.050	791	378	103	66	26	14
May									0.096	0.048	442	193	323	107	20	11
Jun									0.096	0.056	768	329	61	32	16	9
Jul									0.105	0.056	209	114	130	45	13	7
Aug									0.120	0.067	454	186	87	37	19	8
Sep									0.144	0.072	484	271	90	47	41	19
Oct									0.148	0.088	1,031	542	99	70	41	30
Nov									0.167	0.113	745	347	264	96	92	39
Dec									0.179	0.100	482	254	101	65	39	24
Jan 17									0.106	0.052	338	175	86	39	36	18
Feb									0.115	0.058	299	155	66	37	35	18
Mar									0.119	0.062	1,267	561	229	120	135	62
Apr	0.109	0.046	3	2	63	19	2	2	0.234	0.102	1,547	716	307	159	87	45
May	0.806	0.069	23	19	35	27	6	5	0.901	0.123	601	317	119	93	36	23
Jun	0.171	0.089	42	33	231	91	11	9	0.285	0.153	377	288	304	139	58	37
Jul	0.129	0.113	81	62	280	206	24	18	0.261	0.162	173	121	316	221	33	24
Aug	0.169	0.126	466	355	497	381	21	16	0.315	0.199	1,593	890	802	525	119	62
Sep	0.200	0.157	336	287	413	359	25	21	0.309	0.225	1,155	742	616	443	68	52
Oct	0.308	0.189	156	92	379	166	28	21	0.427	0.266	1,101	530	509	223	84	54
Nov	0.294	0.183	103	58	449	226	37	18	0.452	0.291	745	449	844	364	122	62
Dec	0.228	0.183	218	138	1,012	553	33	23	0.386	0.273	1,778	1,122	1,185	661	135	79
Jan 18	0.378	0.217	99	45	461	140	22	13	0.489	0.271	875	683	679	278	58	38
Feb	0.268	0.225	58	38	397	239	770	202	0.397	0.295	412	276	508	300	787	213
Mar	0.284	0.255	1,601	451	7,574	2,790	260	79	0.397	0.322	1,857	664	7,601	2,811	284	95
Apr	0.311	0.266	47	27	91	56	26	13	0.401	0.318	375	218	121	77	38	21
May	0.318	0.258	172	56	923	409	48	23	0.413	0.315	926	468	990	442	65	35
Jun	0.365	0.283	48	18	689	260	657	172	0.459	0.338	852	411	783	308	681	185

	Vero Blue Discharge								Total Custom Meat + Mary Anns + Vero Blue							
Month	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day	Max Flow MGD	Average Flow MGD	Max CBOD lbs/day	Average CBOD lbs/day	Max TSS lbs/day	Average TSS lbs/day	Max TKN lbs/d	Average TKN lbs/day
Jul	0.313	0.235	102	46	426	214	24	13	0.452	0.287	1,536	717	657	287	88	48
Aug	0.197	0.101	25	15	285	148	16	8	0.304	0.164	2,360	951	566	244	109	59
Sep	0.403	0.059	12	5	31	16	4	2	0.505	0.123	832	466	166	85	58	32
Oct	0.317	0.068	14	6	13	7	4	2	0.477	0.159	498	415	76	47	44	30
Nov	0.100	0.023	9	3	18	5	4	2	0.260	0.126	940	527	260	95	72	47
Dec	0.094	0.025	4	1	4	2	3	1	0.266	0.112	496	301	57	23	79	29
Jan 19									0.258	0.055	522	301	103	47	28	21
Feb	0.081	28.000							0.086	0.049	491	410	72	45	37	27
Mar									0.075	0.051	583	351	51	33	28	20
Apr									0.073	0.051	1,251	569	130	46	60	25
May									0.077	0.046	466	291	49	26	41	22
Jun									0.105	0.048	611	404	91	41	28	19
Jul									0.100	0.054	618	350	63	35	26	18
Aug									0.088	0.054	1,231	743	75	48	41	23
Sep									0.112	0.056	1,072	607	141	73	48	32
Oct									0.138	0.068	1,705	555	186	65	102	35
Nov									0.144	0.087	1,078	653	142	73	93	52
Dec									0.143	0.067	1,052	698	284	148	53	38
2017-19																
Average	0.266	1.417	172	84	680	301	96	32	0.281	0.152	934	503	534	242	108	47
Maximum	0.806	28.000	1,601	451	7,574	2,790	770	202	0.901	0.338	2,360	1,122	7,601	2,811	787	213
90th Perctl	0.377	0.265	336	287	923	409	260	79	0.468	0.305	1,649	743	823	443	135	71
95th Perctl	0.402	0.282	466	355	1,012	553	657	172	0.493	0.319	1,798	905	1,039	559	383	117
99th Pertl	0.721	22.179	1,374	432	6,262	2,343	747	196	0.763	0.332	2,184	1,062	5,355	2,058	750	203
Minimum																
2012-19																
Average	0.266	1.417	172	84	680	301	96	32	0.172	0.093	772	412	301	141	67	32
Maximum	0.806	28.000	1,601	451	7,574	2,790	770	202	0.901	0.338	2,426	1,122	7,601	2,811	787	213
90th Perctl	0.377	0.265	336	287	923	409	260	79	0.399	0.245	1,541	717	537	261	106	55
95th Perctl	0.402	0.282	466	355	1,012	553	657	172	0.454	0.292	1,792	878	787	383	135	63
99th Pertl	0.721	22.179	1,374	432	6,262	2,343	747	196	0.525	0.323	2,363	960	1,505	768	686	186

Population: 7,814

Month	Residential/Commercial Loads (Calculated) Average Flow (Inc. I/I) MGD	Average CBOD lbs/day	Average TSS lbs/day	Average TKN lbs/day	Per Capita Res/Comm. Loads Average Flow (Inc. I/I) gal/c/d	Average CBOD lbs/c/d	Average TSS lbs/c/d	Average TKN lbs/c/d	AWW I/I Calculation Average Res + I/I MGD	Average Res Dry Weather MGD	I/I Calc. MGD	MWW I/I Calculation Max MGD	Avg Industrial MGD	Average Res Dry Weather MGD	Max I/I
Jan 12	0.818	2,825	3,397	284	105	0.36	0.43	0.036	0.818	0.719	0.099	0.988	0.031	0.719	0.238
Feb	0.798	2,689	3,154	228	102	0.34	0.40	0.029	0.798	0.719	0.079	1.258	0.049	0.719	0.490
Mar	0.997	3,939	4,314	438	128	0.50	0.55	0.056	0.997	0.719	0.278	1.210	0.066	0.719	0.425
Apr	1.052	2,739	4,077	479	135	0.35	0.52	0.061	1.052	0.719	0.333	1.603	0.038	0.719	0.846
May	1.284	3,065	3,607	318	164	0.39	0.46	0.041	1.284	0.719	0.565	2.746	0.052	0.719	1.976
Jun	0.904	2,881	3,416	302	116	0.37	0.44	0.039	0.904	0.719	0.185	1.359	0.051	0.719	0.589
Jul	0.806	2,534	3,176	364	103	0.32	0.41	0.047	0.806	0.719	0.087	1.627	0.053	0.719	0.855
Aug	0.822	2,000	3,459	303	105	0.26	0.44	0.039	0.822	0.719	0.103	1.700	0.062	0.719	0.919
Sep	0.778	2,311	2,881	256	100	0.30	0.37	0.033	0.778	0.719	0.059	1.011	0.044	0.719	0.248
Oct	0.821	2,932	3,385	405	105	0.38	0.43	0.052	0.821	0.719	0.102	1.169	0.071	0.719	0.379
Nov	0.823	3,565	2,988	328	105	0.46	0.38	0.042	0.823	0.719	0.104	0.976	0.088	0.719	0.169
Dec	0.796	3,510	2,749	388	102	0.45	0.35	0.050	0.796	0.719	0.077	0.939	0.057	0.719	0.163
Jan 13	0.757	2,690	2,448	326	97	0.34	0.31	0.042	0.757	0.719	0.038	1.066	0.042	0.719	0.305
Feb	0.773	3,402	3,234	329	99	0.44	0.41	0.042	0.773	0.719	0.054	0.994	0.049	0.719	0.226
Mar	1.052	2,873	2,743	280	135	0.37	0.35	0.036	1.052	0.719	0.333	2.040	0.044	0.719	1.277
Apr	2.066	2,231	2,589	455	264	0.29	0.33	0.058	2.066	0.719	1.347	4.966	0.040	0.719	4.208
May	3.222	2,409	2,645	284	412	0.31	0.34	0.036	3.222	0.719	2.503	6.542	0.051	0.719	5.772
Jun	2.182	1,967	3,705	265	279	0.25	0.47	0.034	2.182	0.719	1.463	4.684	0.042	0.719	3.923
Jul	1.153	2,901	3,352	340	148	0.37	0.43	0.044	1.153	0.719	0.434	1.830	0.040	0.719	1.071
Aug	0.804	3,546	4,192	475	103	0.45	0.54	0.061	0.804	0.719	0.085	1.029	0.047	0.719	0.263
Sep	0.750	1,983	2,313	308	96	0.25	0.30	0.039	0.750	0.719	0.031	1.123	0.045	0.719	0.359
Oct	0.740	2,929	2,897	365	95	0.37	0.37	0.047	0.740	0.719	0.021	1.416	0.062	0.719	0.635
Nov	0.731	3,004	2,987	355	94	0.38	0.38	0.045	0.731	0.719	0.012	1.057	0.082	0.719	0.256
Dec	0.719	2,037	2,686	276	92	0.26	0.34	0.035	0.719	0.719	0.000	0.851	0.052	0.719	0.080
Jan 14	0.726	2,295	2,105	307	93	0.29	0.27	0.039	0.726	0.719	0.007	0.865	0.042	0.719	0.104
Feb	0.745	2,508	2,300	295	95	0.32	0.29	0.038	0.745	0.719	0.026	0.969	0.039	0.719	0.211
Mar	0.895	2,461	2,956	338	115	0.31	0.38	0.043	0.895	0.719	0.176	1.660	0.054	0.719	0.887
Apr	1.079	2,887	2,922	275	138	0.37	0.37	0.035	1.079	0.719	0.360	1.962	0.049	0.719	1.194
May	1.612	1,851	3,295	251	206	0.24	0.42	0.032	1.612	0.719	0.893	4.967	0.040	0.719	4.208
Jun	1.837	2,084	3,453	270	235	0.27	0.44	0.035	1.837	0.719	1.118	5.900	0.039	0.719	5.142
Jul	1.758	3,177	2,168	278	225	0.41	0.28	0.036	1.758	0.719	1.039	5.900	0.043	0.719	5.138
Aug	1.020	1,954	1,824	263	131	0.25	0.23	0.034	1.020	0.719	0.301	1.523	0.042	0.719	0.762
Sep	1.233	2,031	1,734	237	158	0.26	0.22	0.030	1.233	0.719	0.514	1.533	0.043	0.719	0.771
Oct	1.314	2,390	3,089	294	168	0.31	0.40	0.038	1.314	0.719	0.595	1.811	0.064	0.719	1.028
Nov	0.991	4,210	3,699	340	127	0.54	0.47	0.044	0.991	0.719	0.272	1.201	0.071	0.719	0.411
Dec	1.037	3,752	3,436	381	133	0.48	0.44	0.049	1.037	0.719	0.318	1.415	0.078	0.719	0.618
Jan 15	1.104	1,987	2,938	262	141	0.25	0.38	0.034	1.104	0.719	0.385	1.278	0.044	0.719	0.515
Feb	1.001	1,986	3,324	304	128	0.25	0.43	0.039	1.001	0.719	0.282	1.229	0.053	0.719	0.457
Mar	1.038	1,990	2,690	300	133	0.25	0.34	0.038	1.038	0.719	0.319	1.323	0.061	0.719	0.543

Population: 7,814

	Residential/Commercial Loads (Calculated)				Per Capita Res/Comm. Loads				AWW I/I Calculation			MWW I/I Calculation			
Month	Average Flow (Inc. I/I) MGD	Average CBOD lbs/day	Average TSS lbs/day	Average TKN lbs/day	Average Flow (Inc. I/I) gal/c/d	Average CBOD lbs/c/d	Average TSS lbs/c/d	Average TKN lbs/c/d	Average Res + I/I MGD	Average Res Dry Weather MGD	I/I Calc. MGD	Max MGD	Avg Industrial MGD	Average Res Dry Weather MGD	Max I/I
Apr	1.379	2,221	2,264	277	176	0.28	0.29	0.035	1.379	0.719	0.660	1.866	0.047	0.719	1.100
May	1.962	1,901	2,584	293	251	0.24	0.33	0.037	1.962	0.719	1.243	2.823	0.057	0.719	2.047
Jun	1.560	1,543	2,514	270	200	0.20	0.32	0.035	1.560	0.719	0.841	2.342	0.048	0.719	1.575
Jul	1.150	2,190	4,967	267	147	0.28	0.64	0.034	1.150	0.719	0.431	1.587	0.053	0.719	0.815
Aug	1.959	1,974	2,625	263	251	0.25	0.34	0.034	1.959	0.719	1.240	7.830	0.050	0.719	7.061
Sep	1.564	1,638	2,955	238	200	0.21	0.38	0.030	1.564	0.719	0.845	3.090	0.058	0.719	2.313
Oct	1.011	2,086	3,972	300	129	0.27	0.51	0.038	1.011	0.719	0.292	1.238	0.079	0.719	0.440
Nov	1.162	2,290	4,741	372	149	0.29	0.61	0.048	1.162	0.719	0.443	2.048	0.088	0.719	1.241
Dec	2.498	1,564	2,564	240	320	0.20	0.33	0.031	2.498	0.719	1.779	6.170	0.082	0.719	5.369
Jan 16	1.738	1,860	1,947	216	222	0.24	0.25	0.028	1.738	0.719	1.019	2.513	0.048	0.719	1.746
Feb	1.847	2,032	2,739	250	236	0.26	0.35	0.032	1.847	0.719	1.128	3.060	0.063	0.719	2.278
Mar	1.938	2,032	3,008	208	248	0.26	0.38	0.027	1.938	0.719	1.219	2.581	0.065	0.719	1.797
Apr	1.606	1,887	2,169	253	206	0.24	0.28	0.032	1.606	0.719	0.887	2.311	0.050	0.719	1.542
May	1.679	1,967	2,291	277	215	0.25	0.29	0.035	1.679	0.719	0.960	2.137	0.048	0.719	1.370
Jun	1.753	1,846	1,507	268	224	0.24	0.19	0.034	1.753	0.719	1.034	2.893	0.056	0.719	2.118
Jul	1.222	1,887	3,187	305	156	0.24	0.41	0.039	1.222	0.719	0.503	2.057	0.056	0.719	1.282
Aug	1.485	1,927	3,840	309	190	0.25	0.49	0.040	1.485	0.719	0.766	3.599	0.067	0.719	2.813
Sep	2.475	2,388	2,681	519	317	0.31	0.34	0.066	2.475	0.719	1.756	6.453	0.072	0.719	5.662
Oct	1.466	2,861	3,009	406	188	0.37	0.39	0.052	1.466	0.719	0.747	2.539	0.088	0.719	1.732
Nov	1.072	2,897	3,324	454	137	0.37	0.43	0.058	1.072	0.719	0.353	1.387	0.113	0.719	0.555
Dec	1.209	3,194	3,595	429	155	0.41	0.46	0.055	1.209	0.719	0.491	1.839	0.100	0.719	1.020
Jan 17	1.276	2,650	3,141	392	163	0.34	0.40	0.050	1.276	0.719	0.557	1.836	0.052	0.719	1.065
Feb	1.659	3,553	3,828	378	212	0.45	0.49	0.048	1.659	0.719	0.941	3.321	0.058	0.719	2.545
Mar	2.585	3,761	3,265	428	331	0.48	0.42	0.055	2.585	0.719	1.866	4.122	0.062	0.719	3.341
Apr	2.478	2,348	2,902	371	317	0.30	0.37	0.047	2.478	0.719	1.759	4.203	0.102	0.719	3.382
May	2.255	3,023	3,266	367	289	0.39	0.42	0.047	2.255	0.719	1.537	3.975	0.123	0.719	3.133
Jun	1.198	2,981	5,531	365	153	0.38	0.71	0.047	1.198	0.719	0.479	1.789	0.153	0.719	0.917
Jul	0.901	3,075	3,763	329	115	0.39	0.48	0.042	0.901	0.719	0.182	1.697	0.162	0.719	0.816
Aug	0.862	2,381	3,584	259	110	0.30	0.46	0.033	0.862	0.719	0.143	1.350	0.199	0.719	0.432
Sep	0.826	3,744	8,299	548	106	0.48	1.06	0.070	0.826	0.719	0.107	1.277	0.225	0.719	0.333
Oct	1.178	3,101	3,793	398	151	0.40	0.49	0.051	1.178	0.719	0.459	2.697	0.266	0.719	1.712
Nov	0.873	3,883	3,915	464	112	0.50	0.50	0.059	0.873	0.719	0.155	1.294	0.291	0.719	0.284
Dec	0.776	1,990	2,064	404	99	0.25	0.26	0.052	0.776	0.719	0.058	1.165	0.273	0.719	0.174
Jan 18	0.939	2,698	3,192	358	120	0.35	0.41	0.046	0.939	0.719	0.220	1.803	0.271	0.719	0.813
Feb	0.916	3,500	3,649	178	117	0.45	0.47	0.023	0.916	0.719	0.197	1.825	0.295	0.719	0.811
Mar	1.431	3,014	1,567	222	183	0.39	0.20	0.028	1.431	0.719	0.712	2.791	0.322	0.719	1.750
Apr	2.399	3,641	6,153	362	307	0.47	0.79	0.046	2.399	0.719	1.681	4.753	0.318	0.719	3.717
May	1.845	2,903	5,750	313	236	0.37	0.74	0.040	1.845	0.719	1.126	2.823	0.315	0.719	1.789
Jun	2.543	3,506	5,399	219	325	0.45	0.69	0.028	2.543	0.719	1.824	7.421	0.338	0.719	6.364

Population: 7,814

Month	Residential/Commercial Loads (Calculated)				Per Capita Res/Comm. Loads				AWW I/I Calculation			MWW I/I Calculation			
	Average Flow (Inc. I/I) MGD	Average CBOD lbs/day	Average TSS lbs/day	Average TKN lbs/day	Average Flow (Inc. I/I) gal/c/d	Average CBOD lbs/c/d	Average TSS lbs/c/d	Average TKN lbs/c/d	Average Res + I/I MGD	Average Res Dry Weather MGD	I/I Calc. MGD	Max MGD	Avg Industrial MGD	Average Res Dry Weather MGD	Max I/I
Jul	1.554	2,670	4,393	305	199	0.34	0.56	0.039	1.554	0.719	0.835	3.646	0.287	0.719	2.640
Aug	2.073	2,926	7,831	340	265	0.37	1.00	0.043	2.073	0.719	1.354	6.956	0.164	0.719	6.073
Sep	3.316	3,631	7,623	308	424	0.46	0.98	0.039	3.316	0.719	2.597	5.962	0.123	0.719	5.120
Oct	3.106	4,433	8,766	219	397	0.57	1.12	0.028	3.106	0.719	2.387	7.887	0.159	0.719	7.009
Nov	1.609	3,417	7,326	362	206	0.44	0.94	0.046	1.609	0.719	0.890	2.259	0.126	0.719	1.414
Dec	1.451	3,408	6,775	447	186	0.44	0.87	0.057	1.451	0.719	0.732	2.944	0.112	0.719	2.113
Jan 19	1.331	2,358	3,852	280	170	0.30	0.49	0.036	1.331	0.719	0.612	1.850	0.055	0.719	1.076
Feb	1.186	2,728	3,906	421	152	0.35	0.50	0.054	1.186	0.719	0.467	1.508	0.049	0.719	0.740
Mar	2.110	3,766	5,853	355	270	0.48	0.75	0.045	2.110	0.719	1.391	7.262	0.051	0.719	6.492
Apr	2.128	3,891	6,228	381	272	0.50	0.80	0.049	2.128	0.719	1.409	3.143	0.051	0.719	2.373
May	3.229	2,359	3,577	339	413	0.30	0.46	0.043	3.229	0.719	2.510	7.519	0.046	0.719	6.754
Jun	2.064	2,772	4,565	305	264	0.35	0.58	0.039	2.064	0.719	1.345	2.973	0.048	0.719	2.206
Jul	1.330	3,769	5,171	321	170	0.48	0.66	0.041	1.330	0.719	0.611	1.886	0.054	0.719	1.113
Aug	1.156	3,003	3,838	383	148	0.38	0.49	0.049	1.156	0.719	0.437	2.180	0.054	0.719	1.407
Sep	1.378	2,384	2,738	305	176	0.31	0.35	0.039	1.378	0.719	0.659	2.496	0.056	0.719	1.721
Oct	3.146	2,689	4,677	485	403	0.34	0.60	0.062	3.146	0.719	2.427	7.274	0.068	0.719	6.487
Nov	1.600	3,074	3,392	381	205	0.39	0.43	0.049	1.600	0.719	0.881	2.282	0.087	0.719	1.476
Dec	1.715	2,523	2,100	348	219	0.32	0.27	0.045	1.715	0.719	0.996	2.538	0.067	0.719	1.752
2017-19															
Average	1.734	3,099	4,602	351	222	0.40	0.59	0.045	1.734	0.719	1.015	3.409	0.152	0.719	2.537
Maximum	3.316	4,433	8,766	548	424	0.57	1.12	0.070	3.316	0.719	2.597	7.887	0.338	0.719	7.009
90th Perctl	2.845	3,768	7,474	437	364	0.48	0.96	0.056	2.845	0.719	2.126	7.268	0.305	0.719	6.426
95th Perctl	3.167	3,885	7,948	469	405	0.50	1.02	0.060	3.167	0.719	2.448	7.446	0.319	0.719	6.558
99th Pertl	3.285	4,243	8,603	526	420	0.54	1.10	0.067	3.285	0.719	2.567	7.758	0.332	0.719	6.920
Minimum	0.776														
2012-19															
Average	1.450	2,711	3,609	329	186	0.35	0.46	0.042	1.450	0.719	0.731	2.737	0.093	0.719	1.926
Maximum	3.316	4,433	8,766	548	424	0.57	1.12	0.070	3.316	0.719	2.597	7.887	0.338	0.719	7.061
90th Perctl	2.437	3,692	5,641	433	312	0.47	0.72	0.055	2.437	0.719	1.718	6.066	0.245	0.719	5.256
95th Perctl	2.715	3,798	6,913	467	347	0.49	0.88	0.060	2.715	0.719	1.996	7.265	0.292	0.719	6.395
99th Pertl	3.233	4,221	8,323	521	414	0.54	1.07	0.067	3.233	0.719	2.514	7.833	0.323	0.719	7.012

Figure B.1 Influent Flow

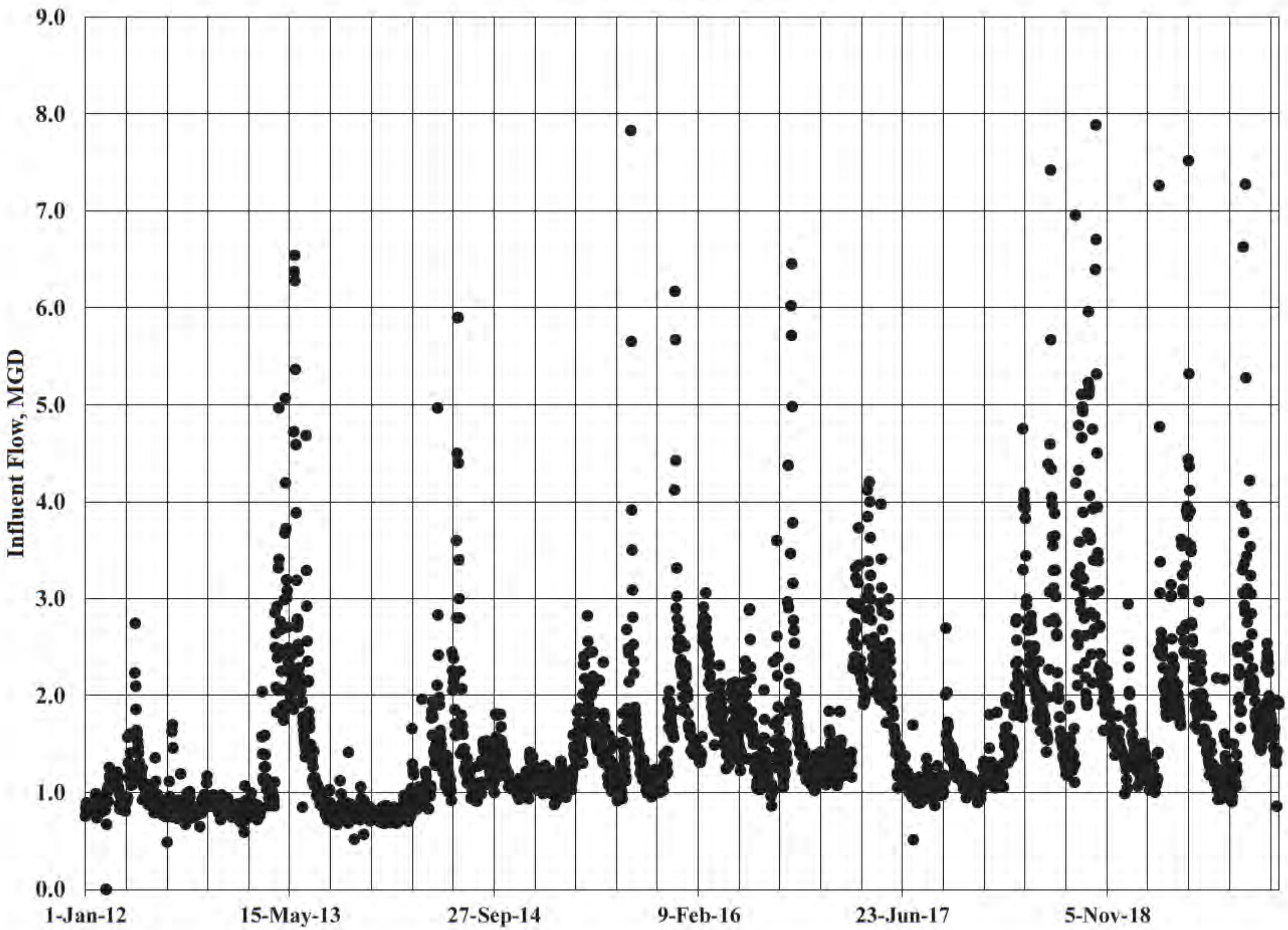


Figure B.2 Average Influent Flow

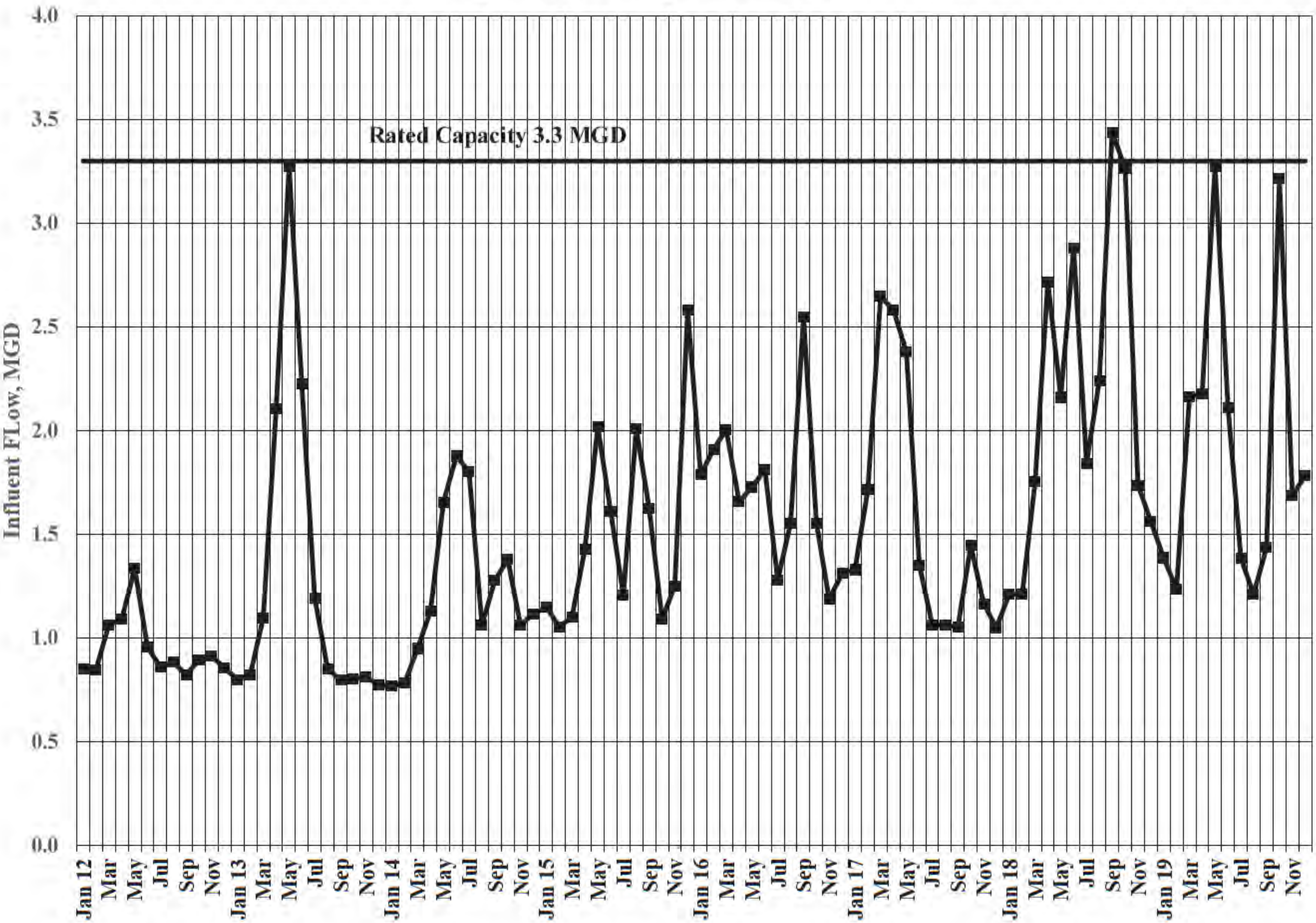


Figure B.3 Maximum Influent Flow

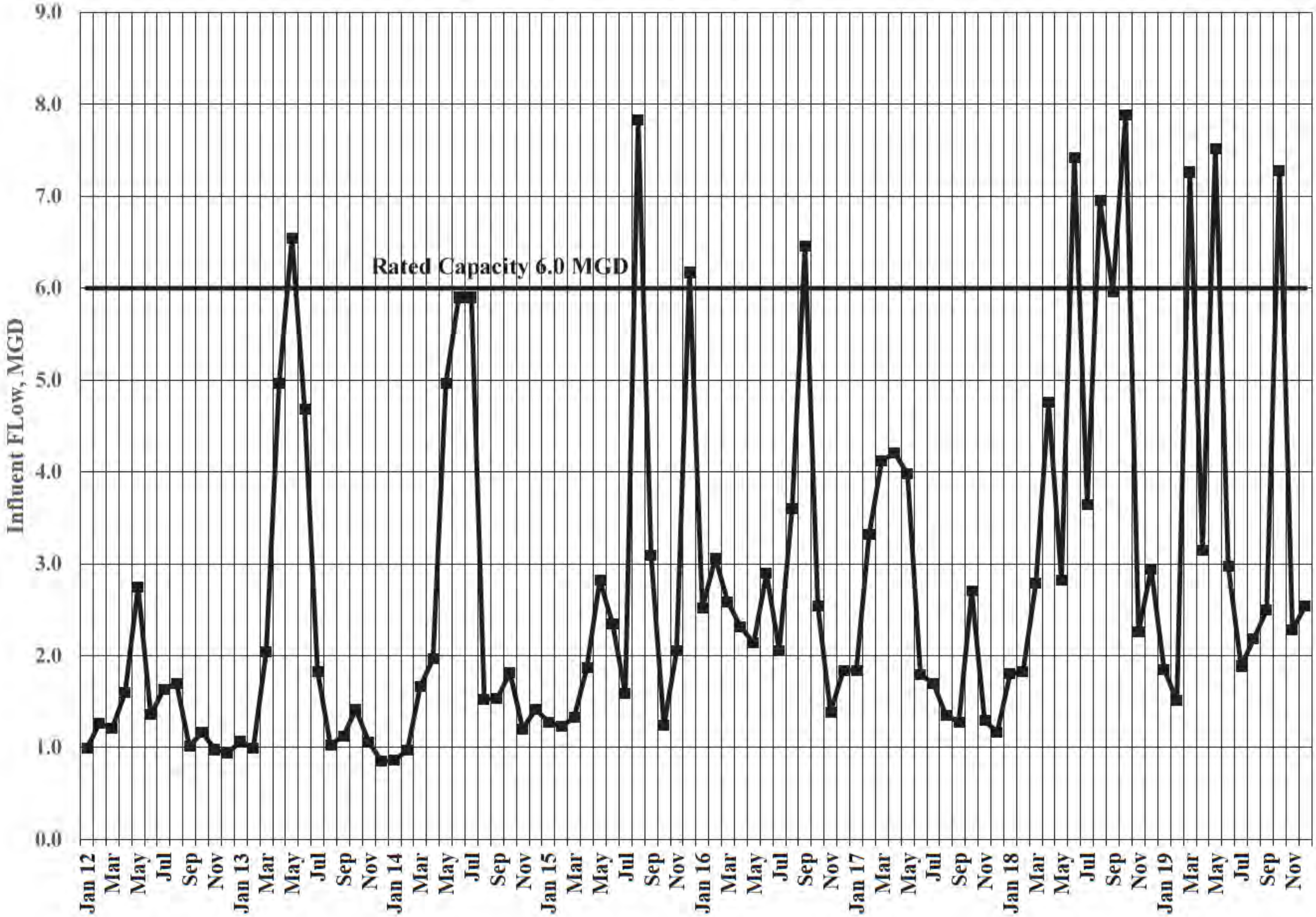


Figure B.4 Average Influent CBOD Load

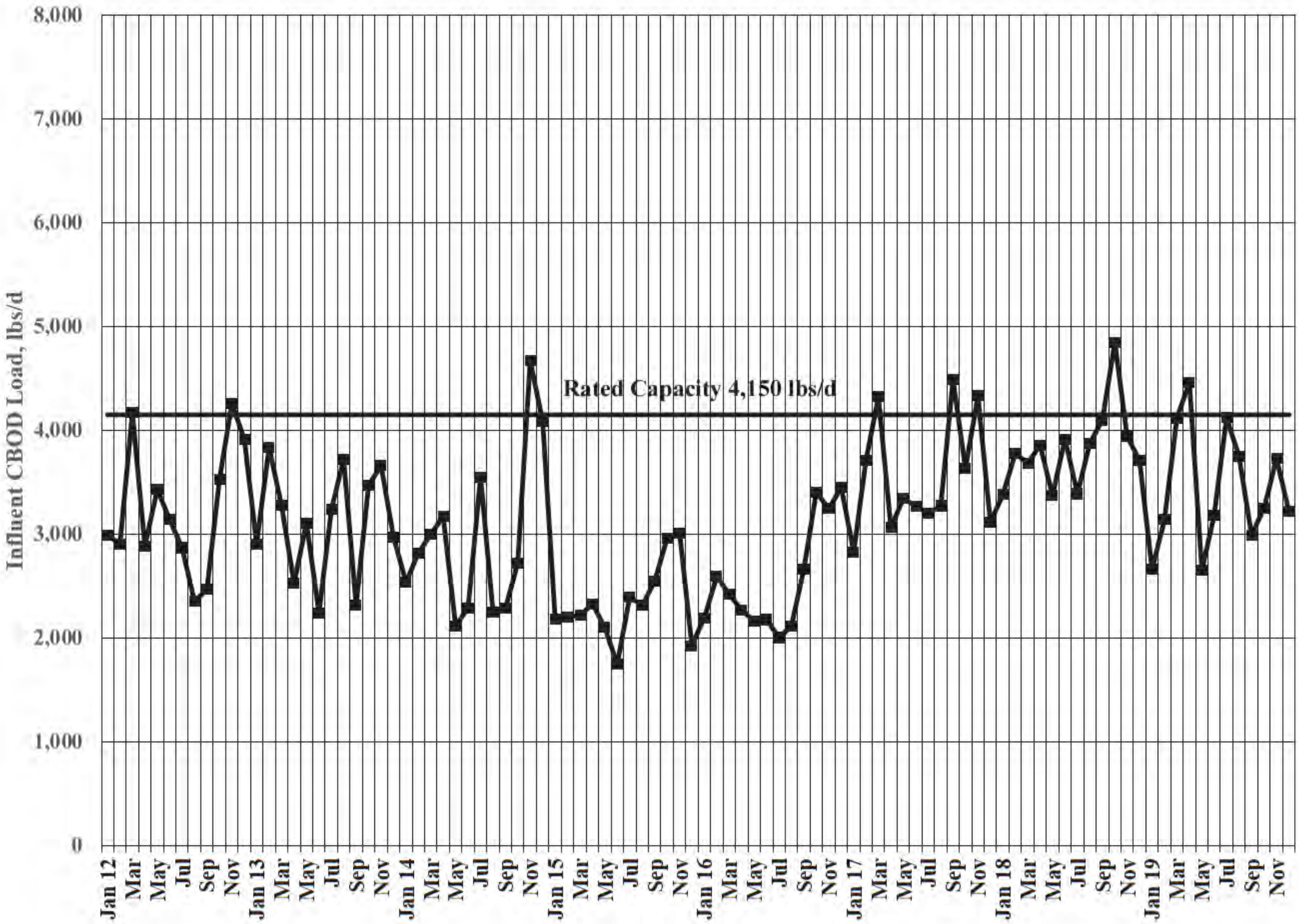


Figure B.5 Maximum Influent CBOD Load

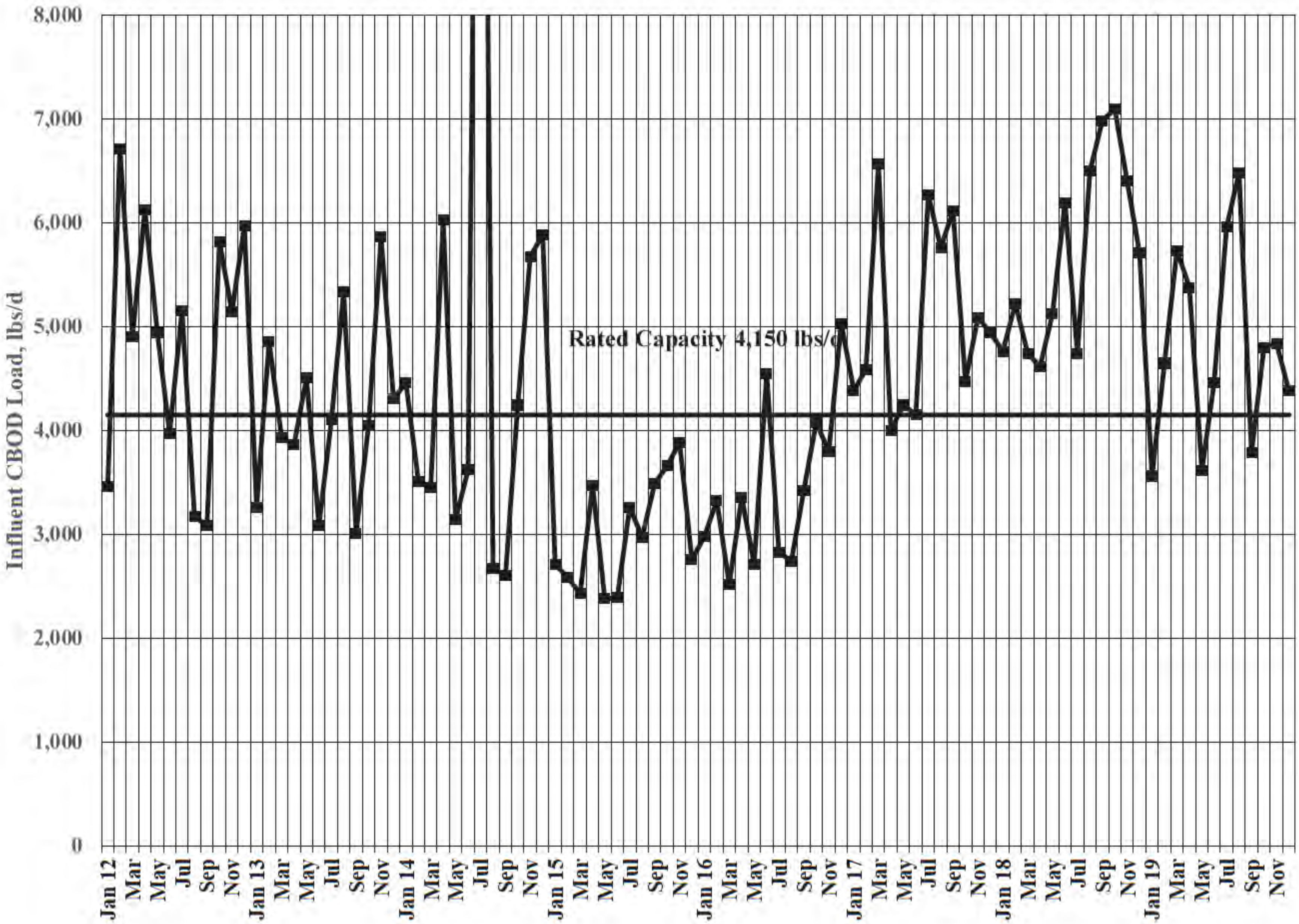


Figure B.6 Average TKN Load

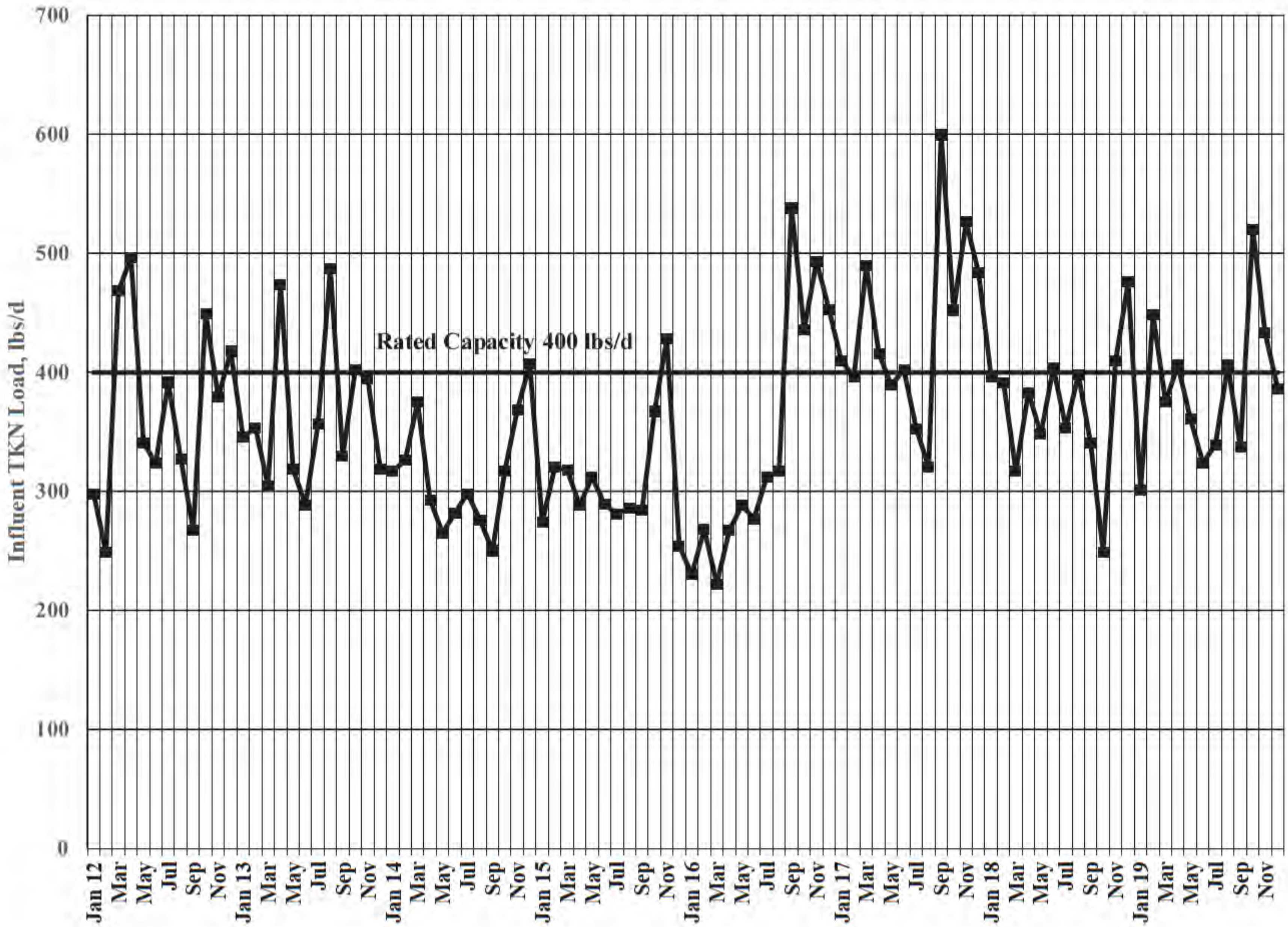


Figure B.7 Maximum TKN Load

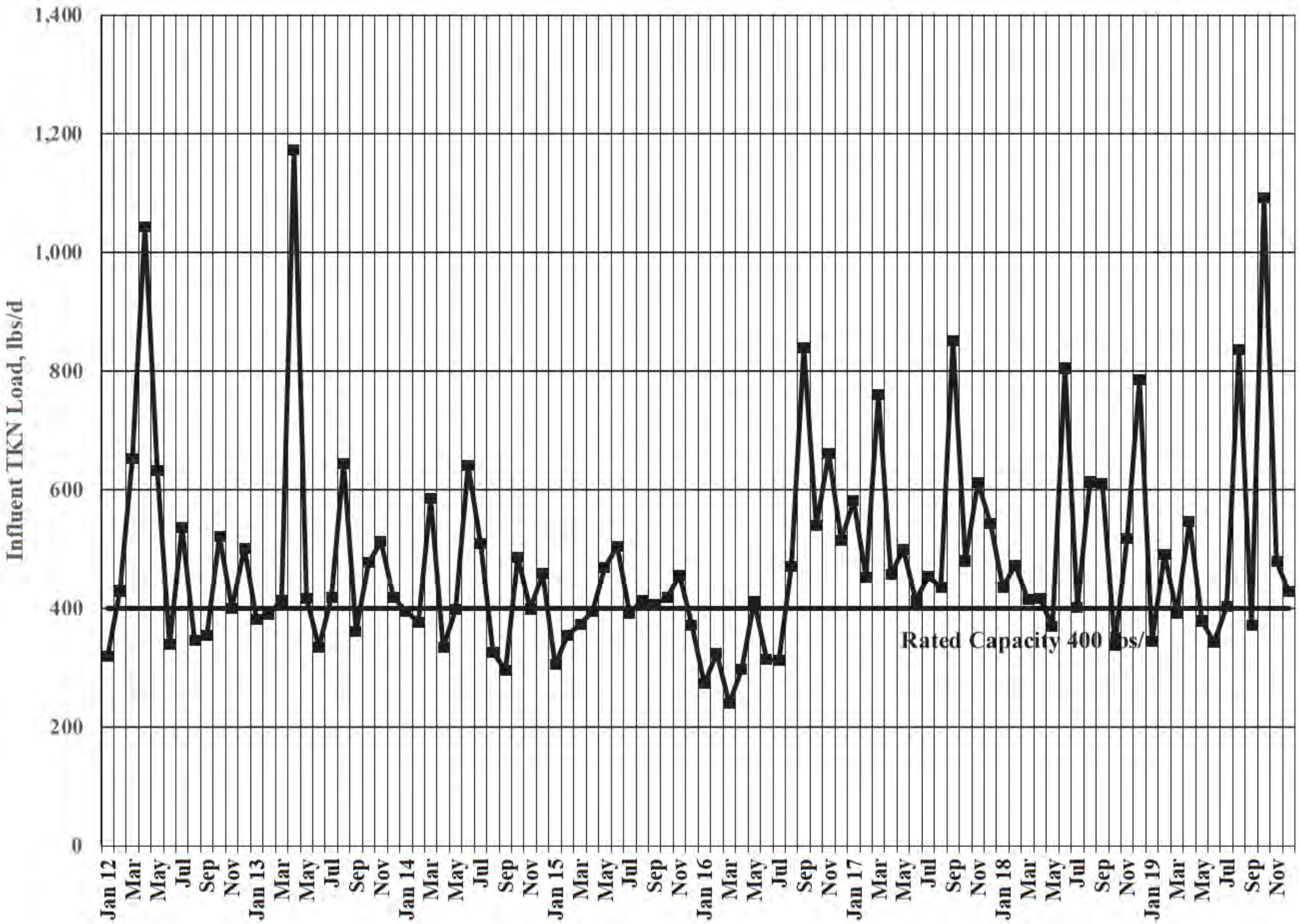


Figure B.8 Average TSS Load

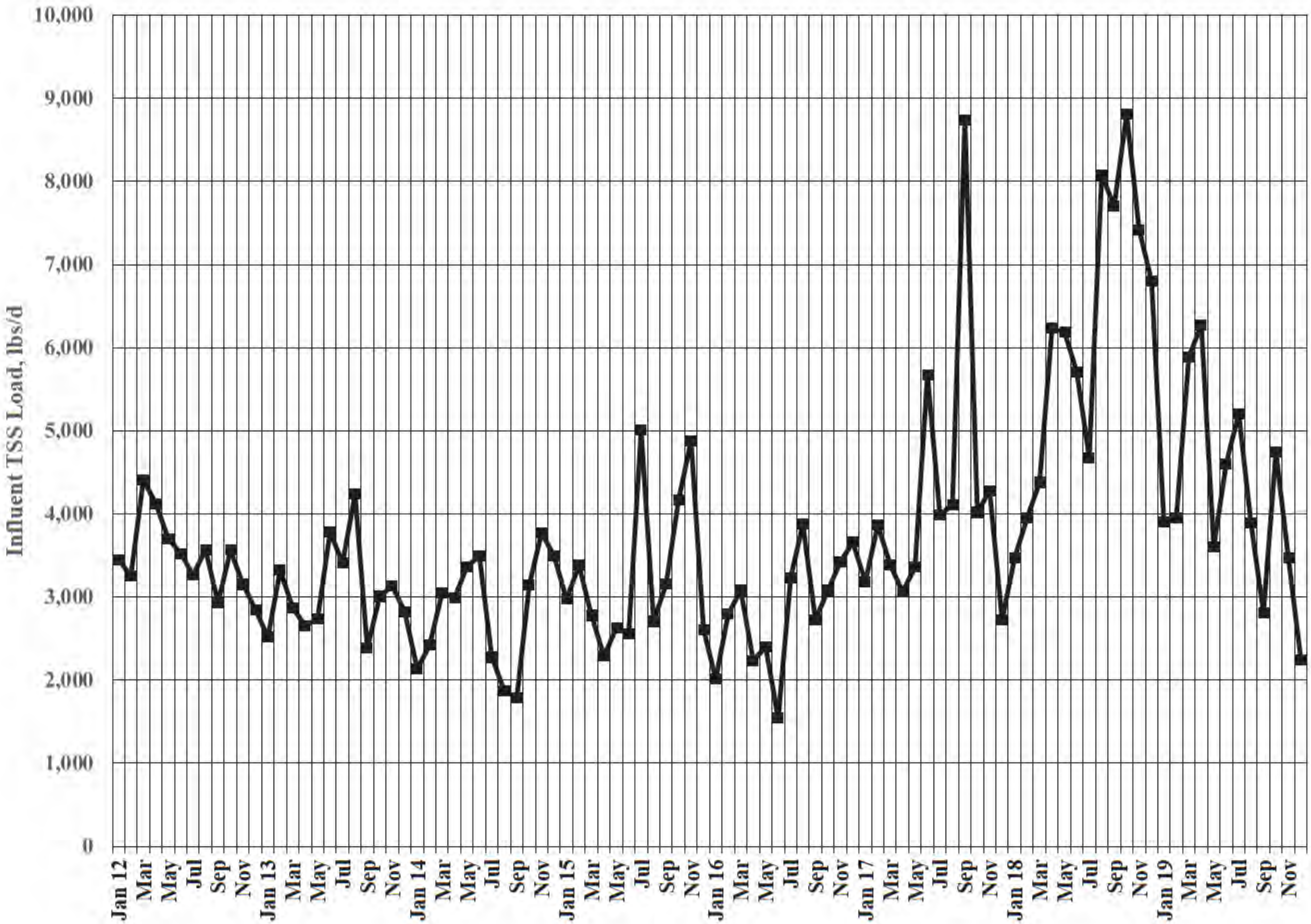


Figure B.9 Maximum TSS Load

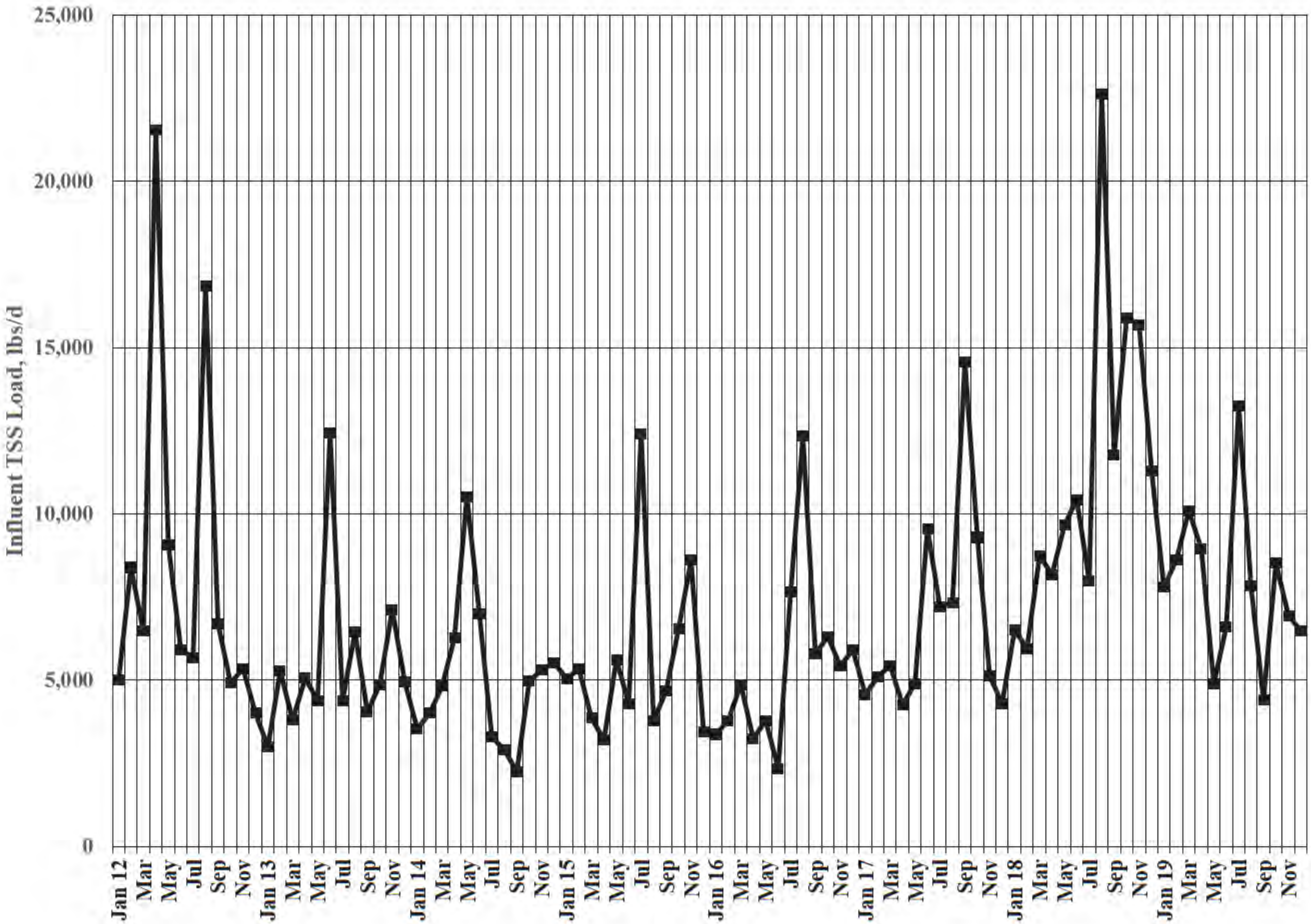


Figure B.10 Average Phosphorus Load

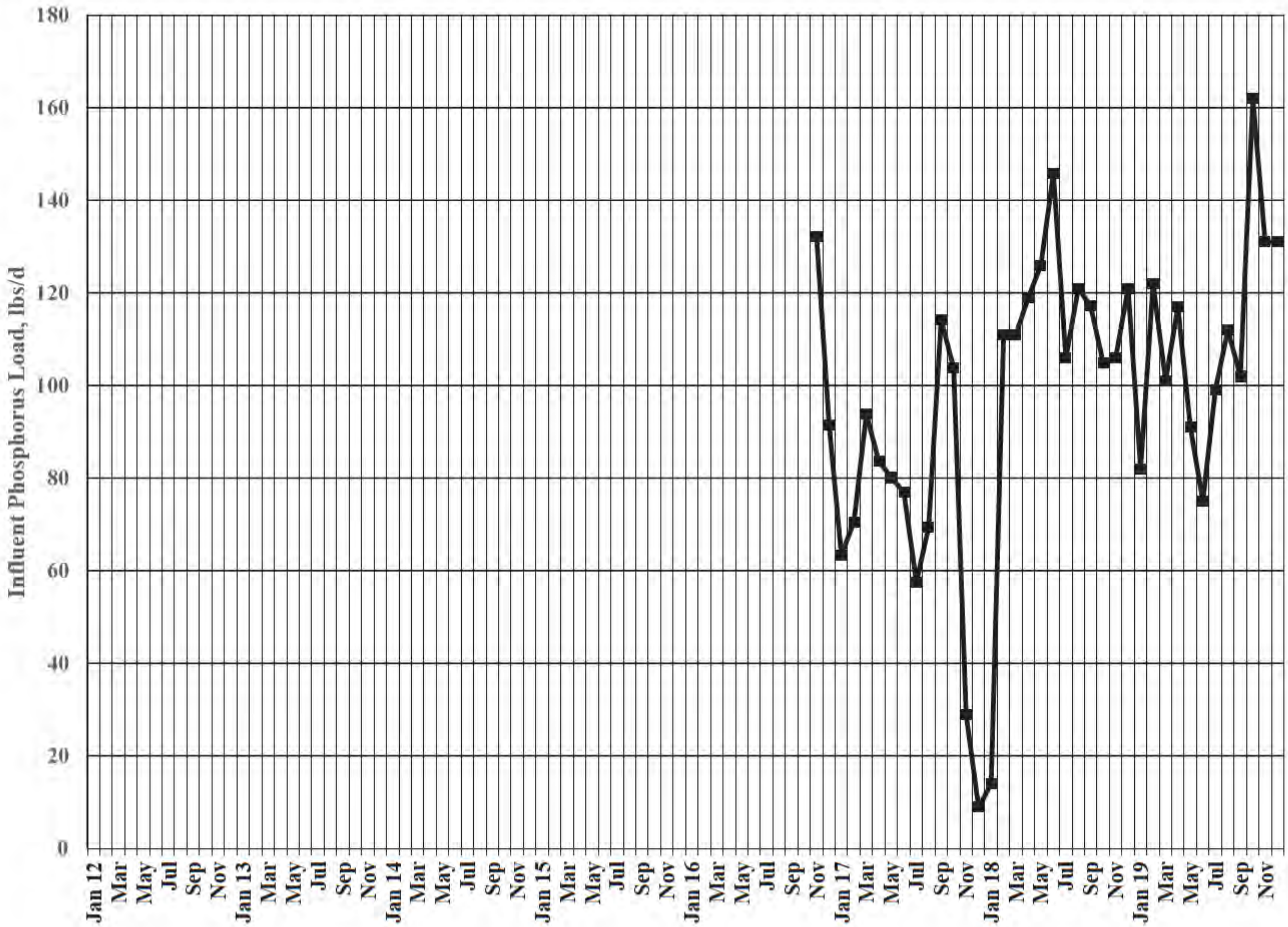


Figure B.11 Maximum Phosphorus Load

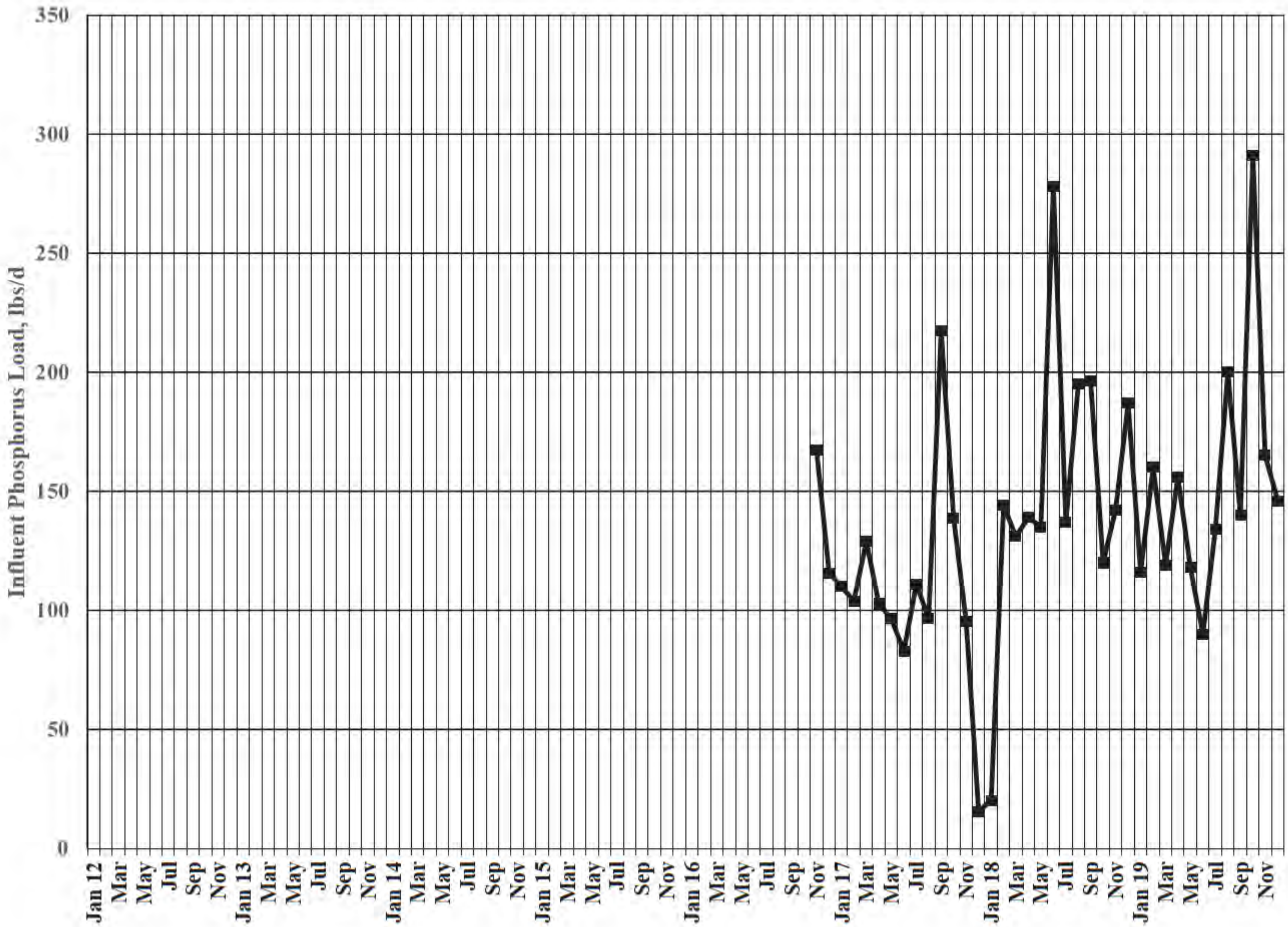


Figure B.12 Average Estimated Inflow and Infiltration Flow

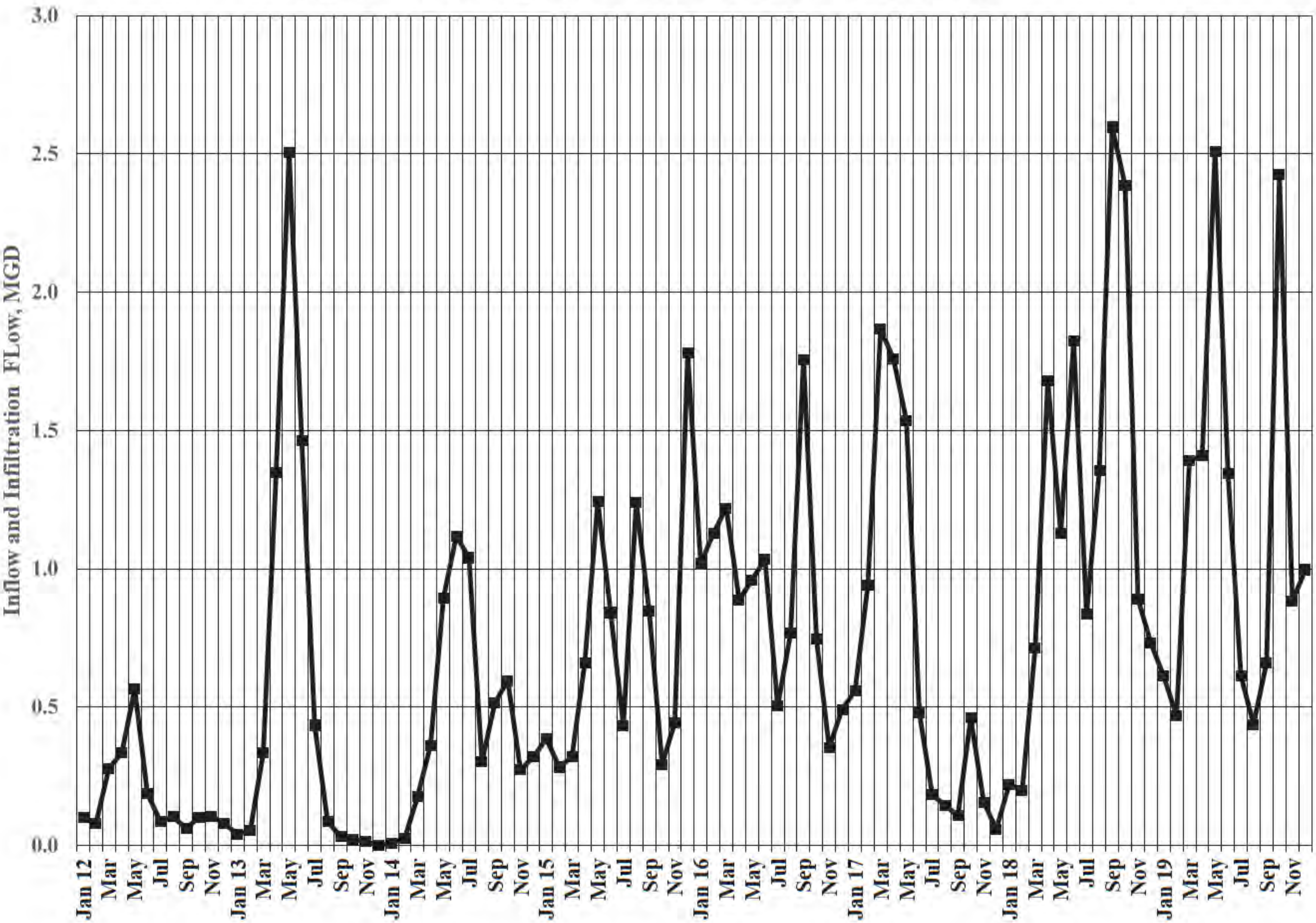


Figure B.13 Maximum Day Estimated Inflow and Infiltration Flow

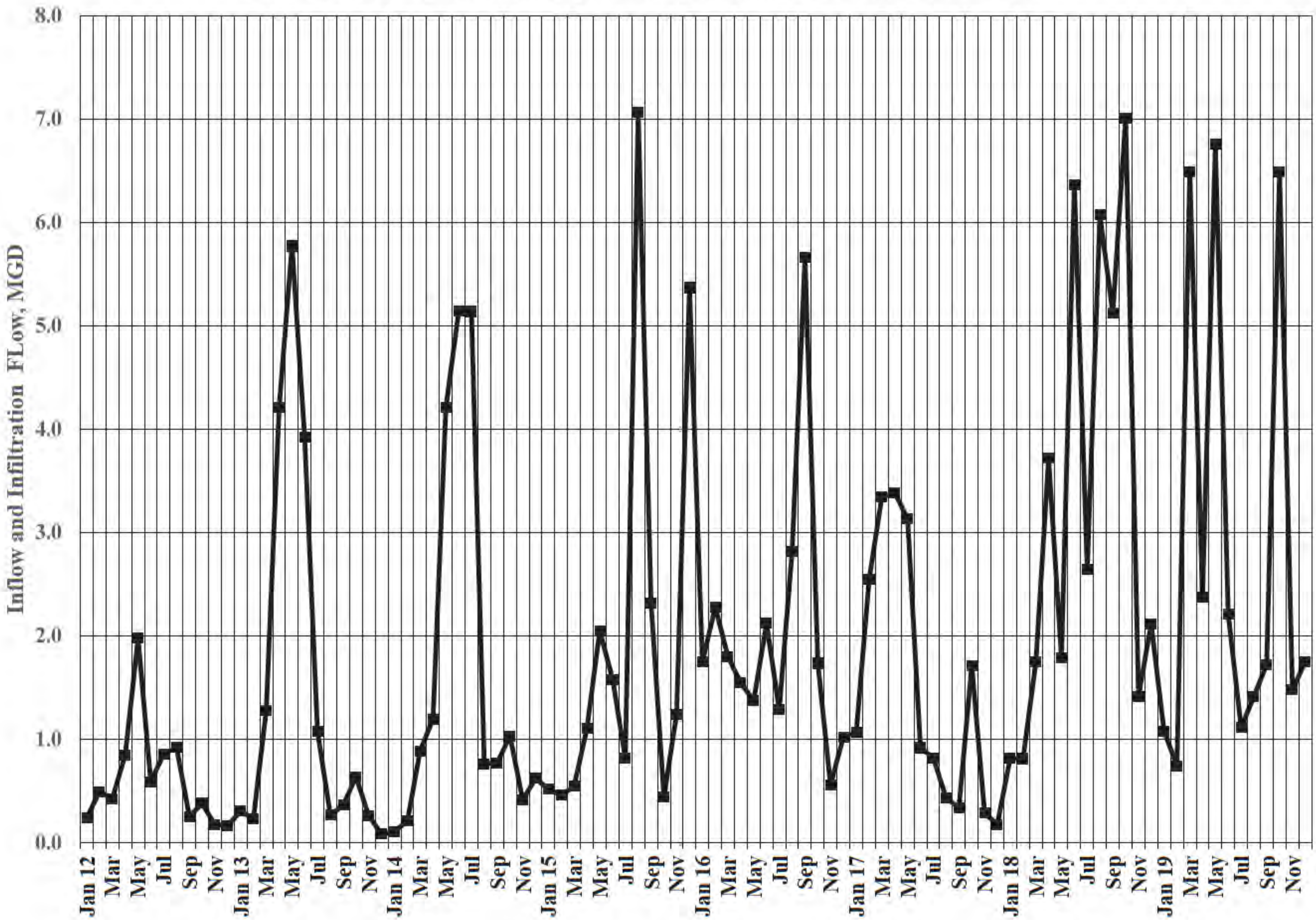


Figure B.14 Average Per Capita CBOD Load

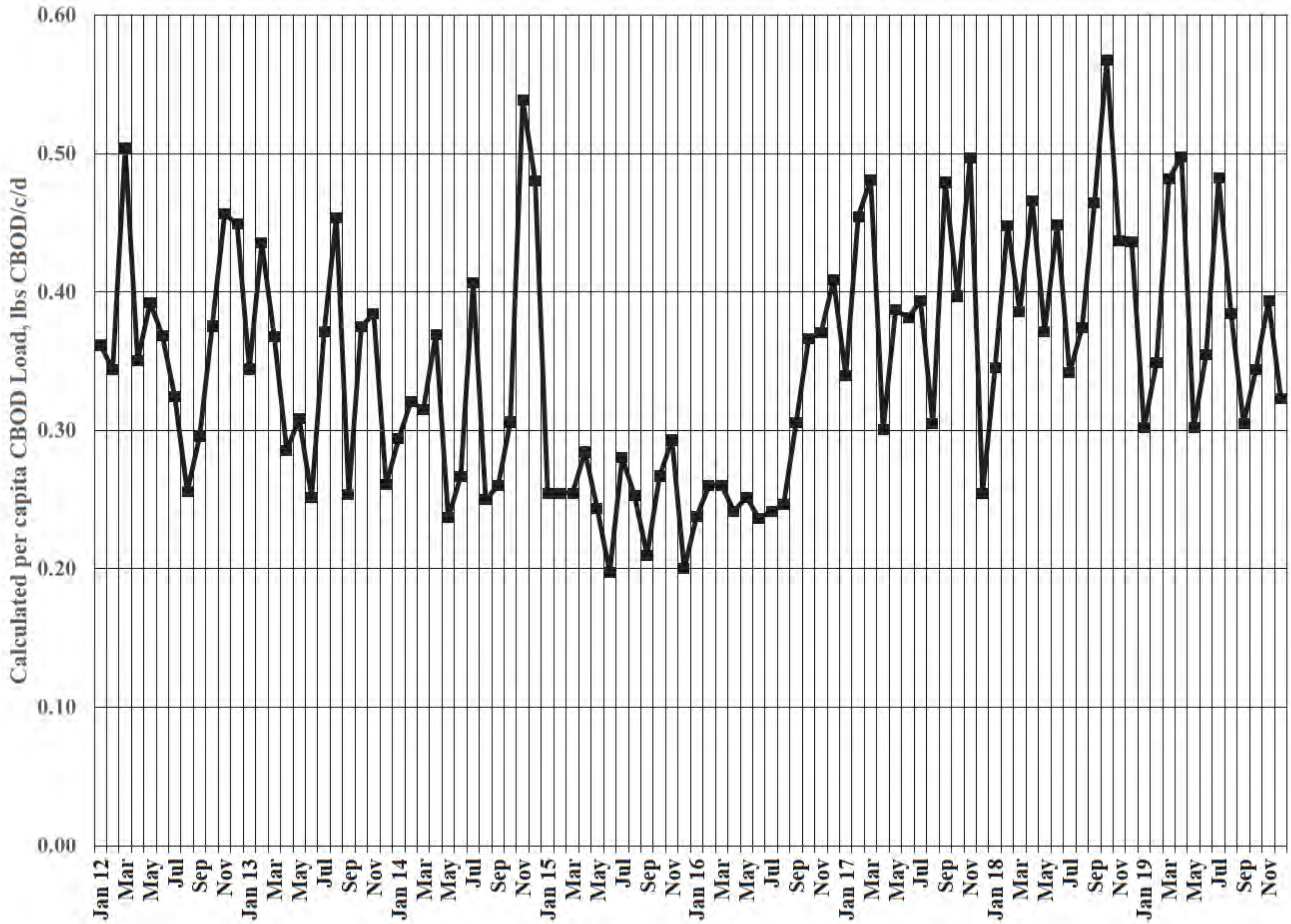


Figure B.15 Average Per Capita TSS Load

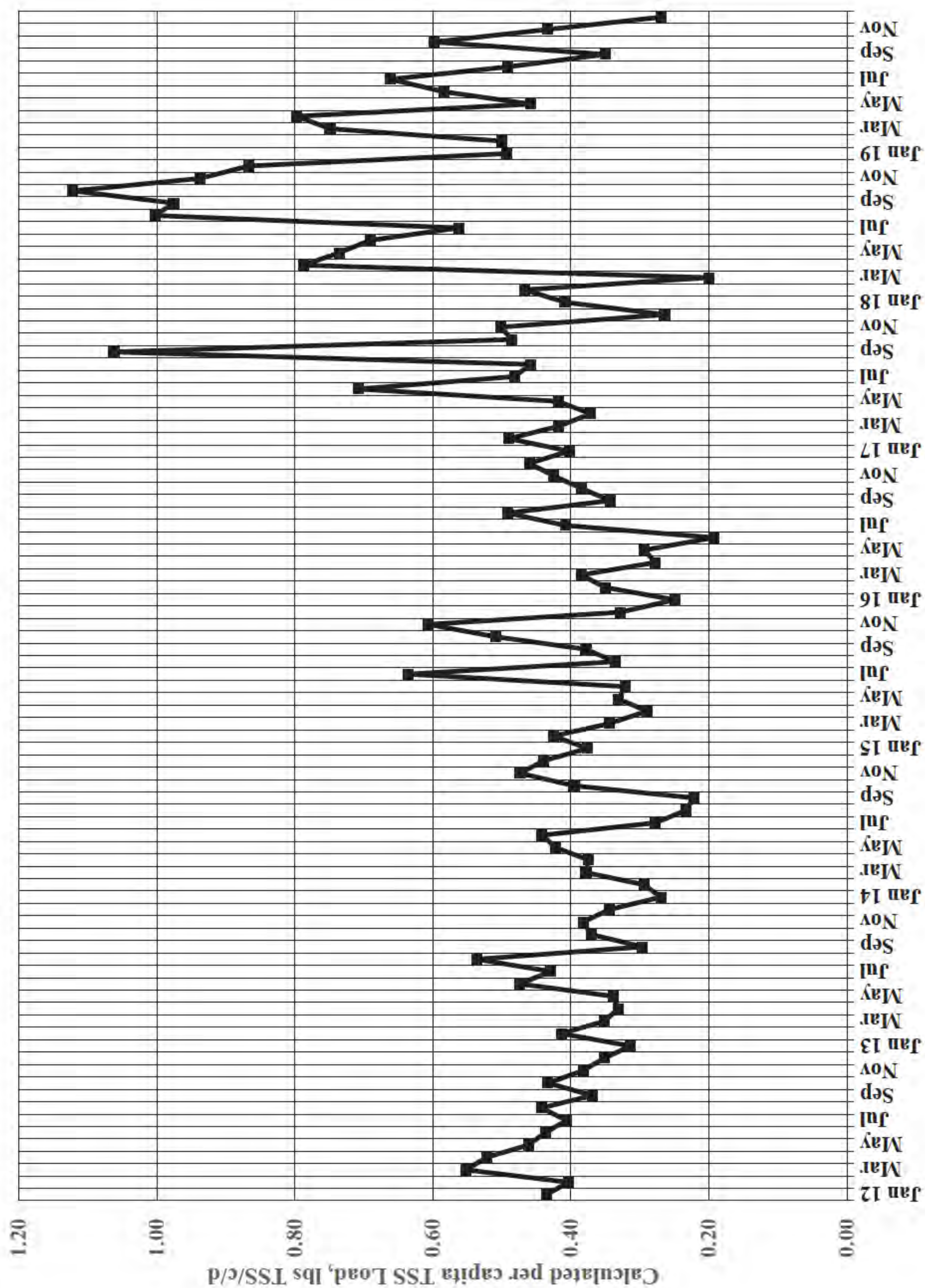


Figure B.16 Average Per Capita TKN Load

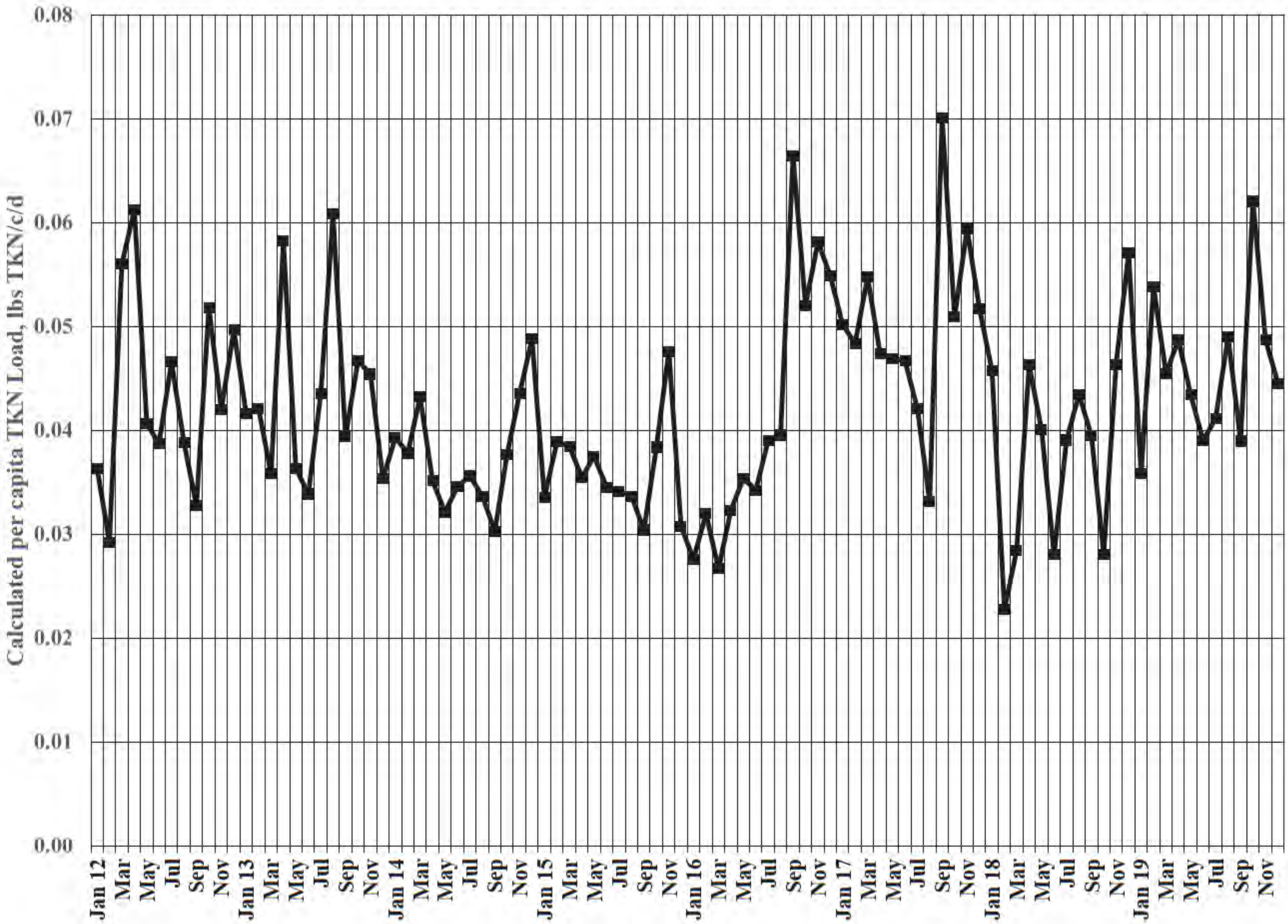


Figure B.17 Monthly Average Per Capita CBOD Load Percentile 2012 - 2020

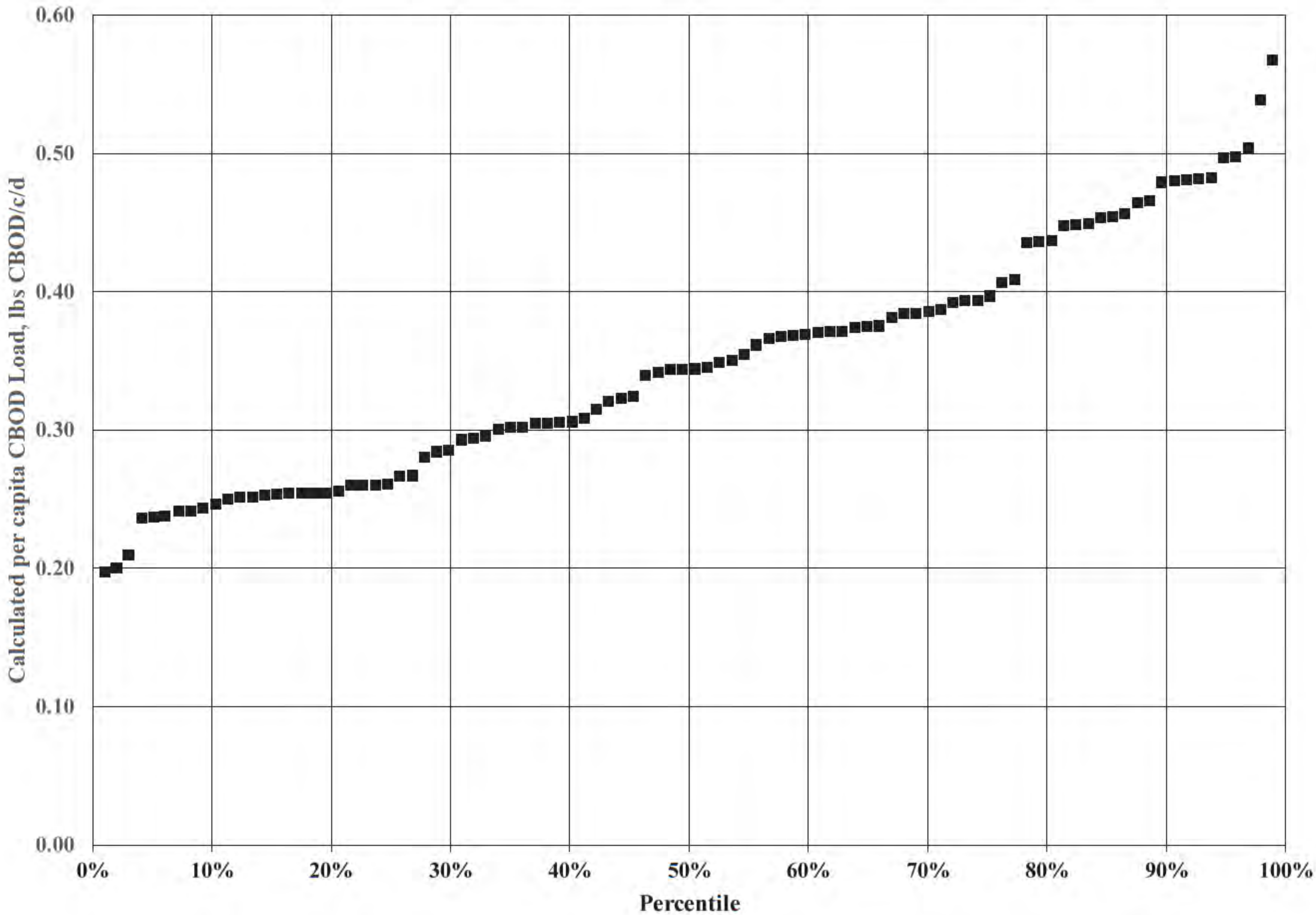


Figure B.18 Monthly Average Per Capita TSS Load Percentile 2012 - 2020

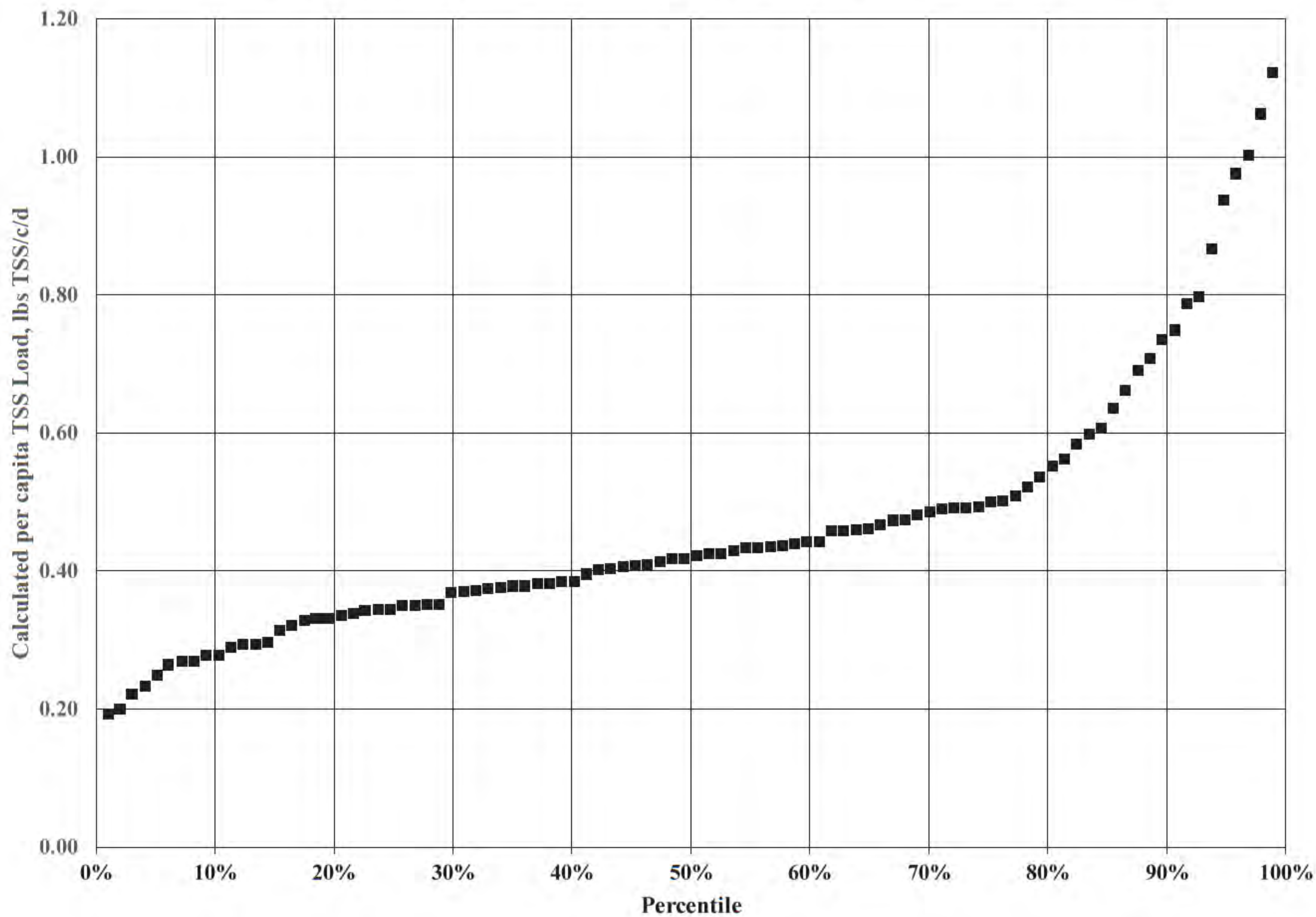


Figure B.19 Monthly Average Per Capita TKN Load Percentile 2012 - 2020

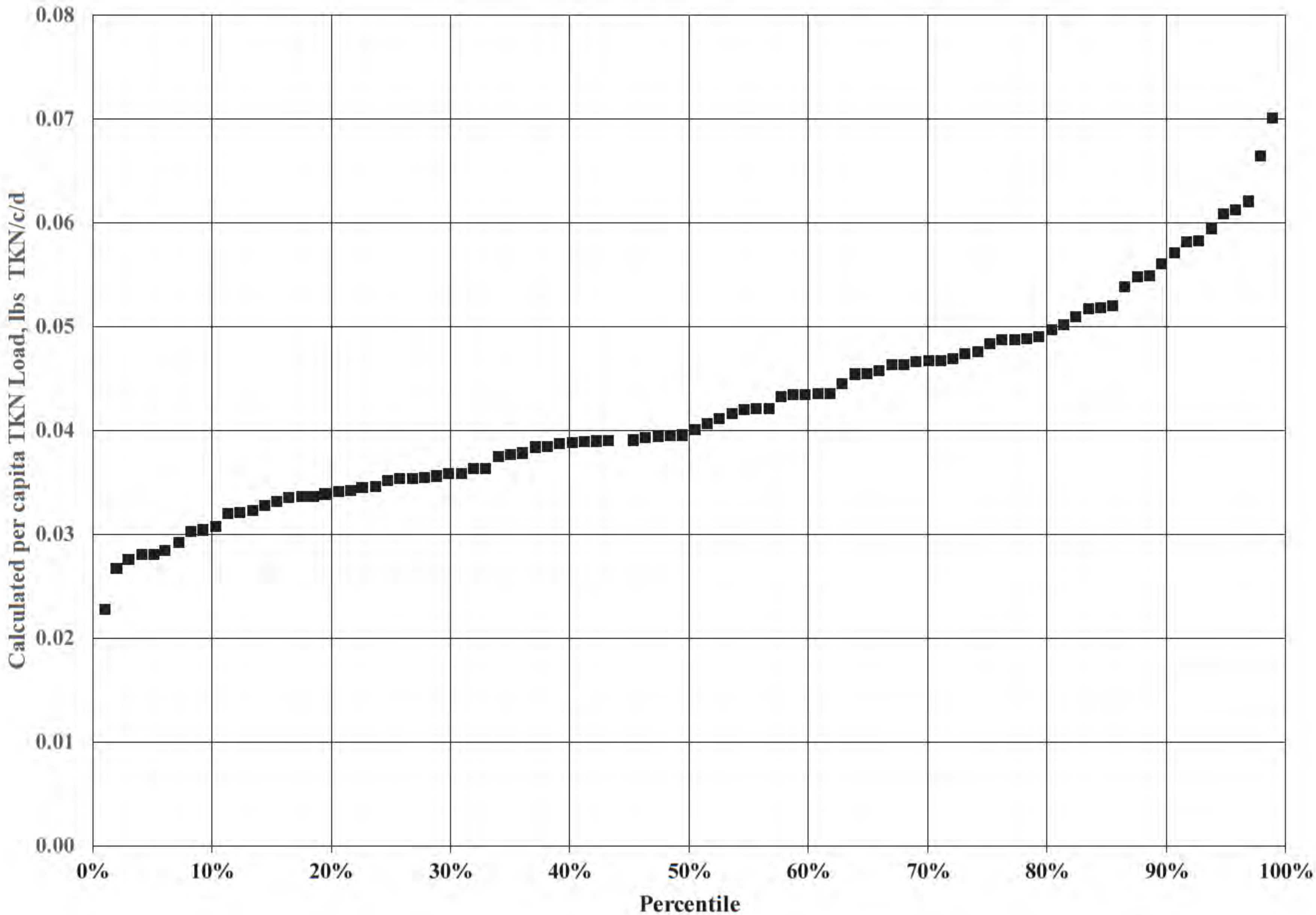


Figure B.20 Monthly Average Influent Flow Percentile 2012 - 2020

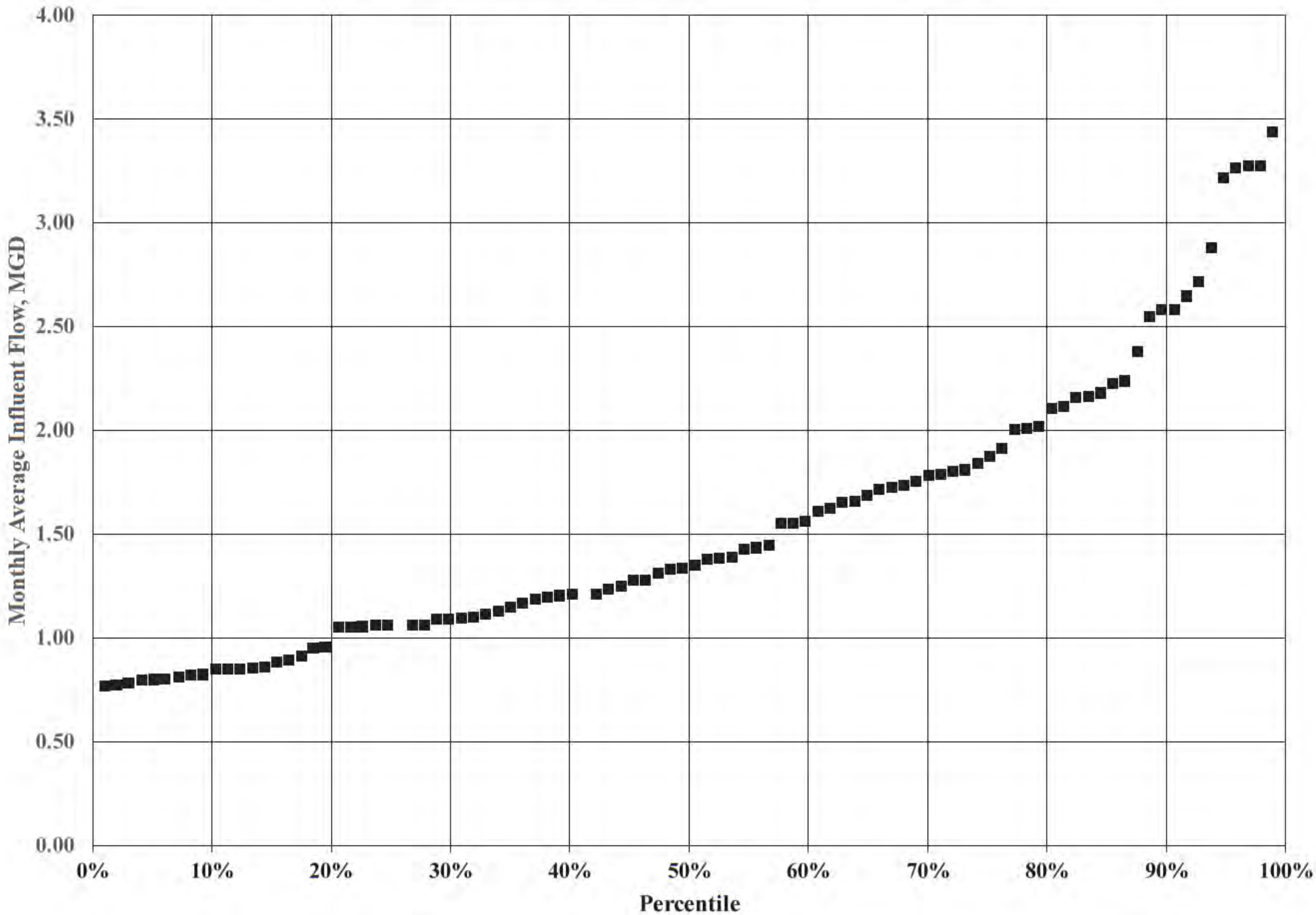


Figure B.21 Monthly Average CBOD Load Percentile 2012 - 2020

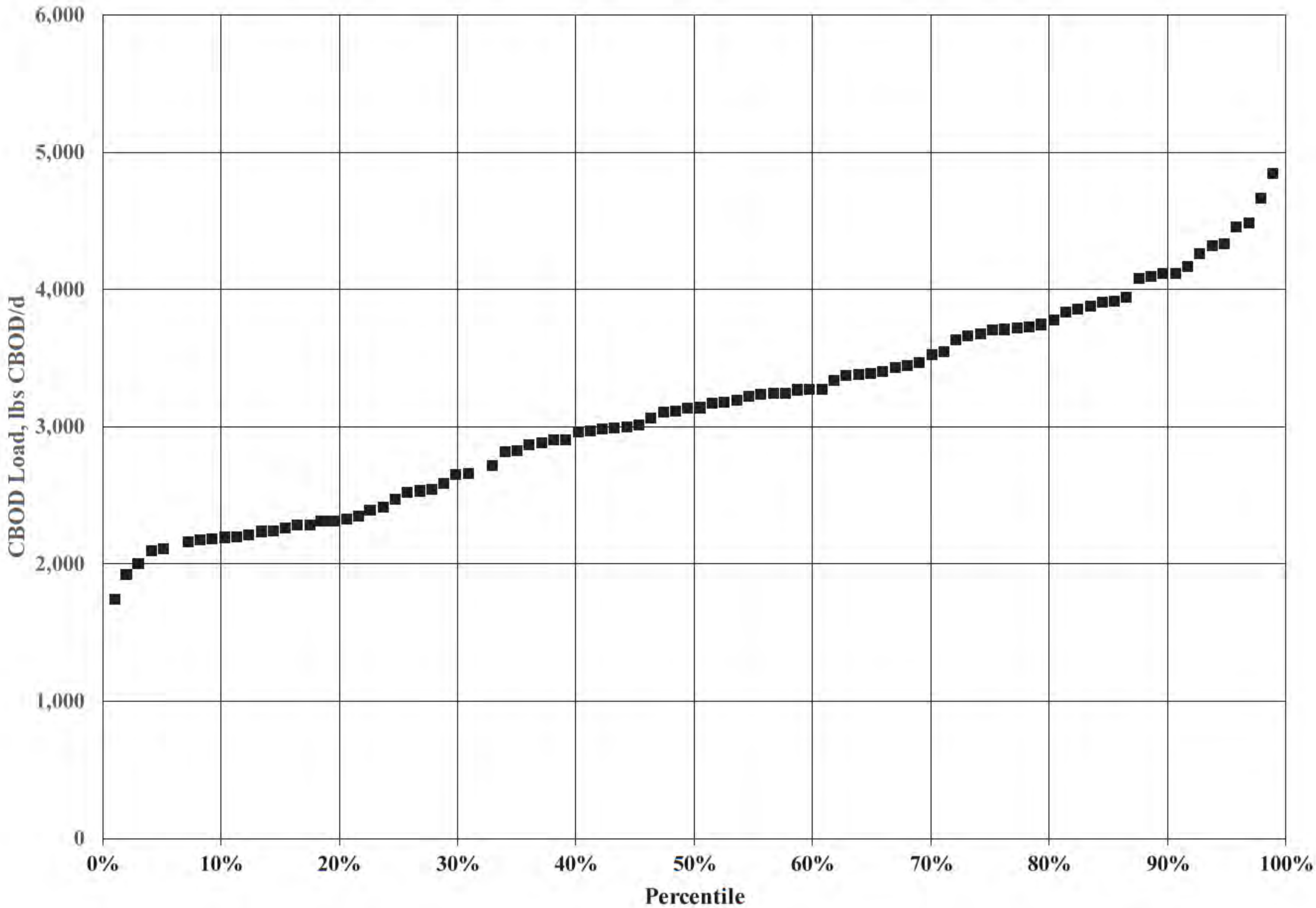


Figure B.22 Monthly Average TSS Load Percentile 2012 - 2020

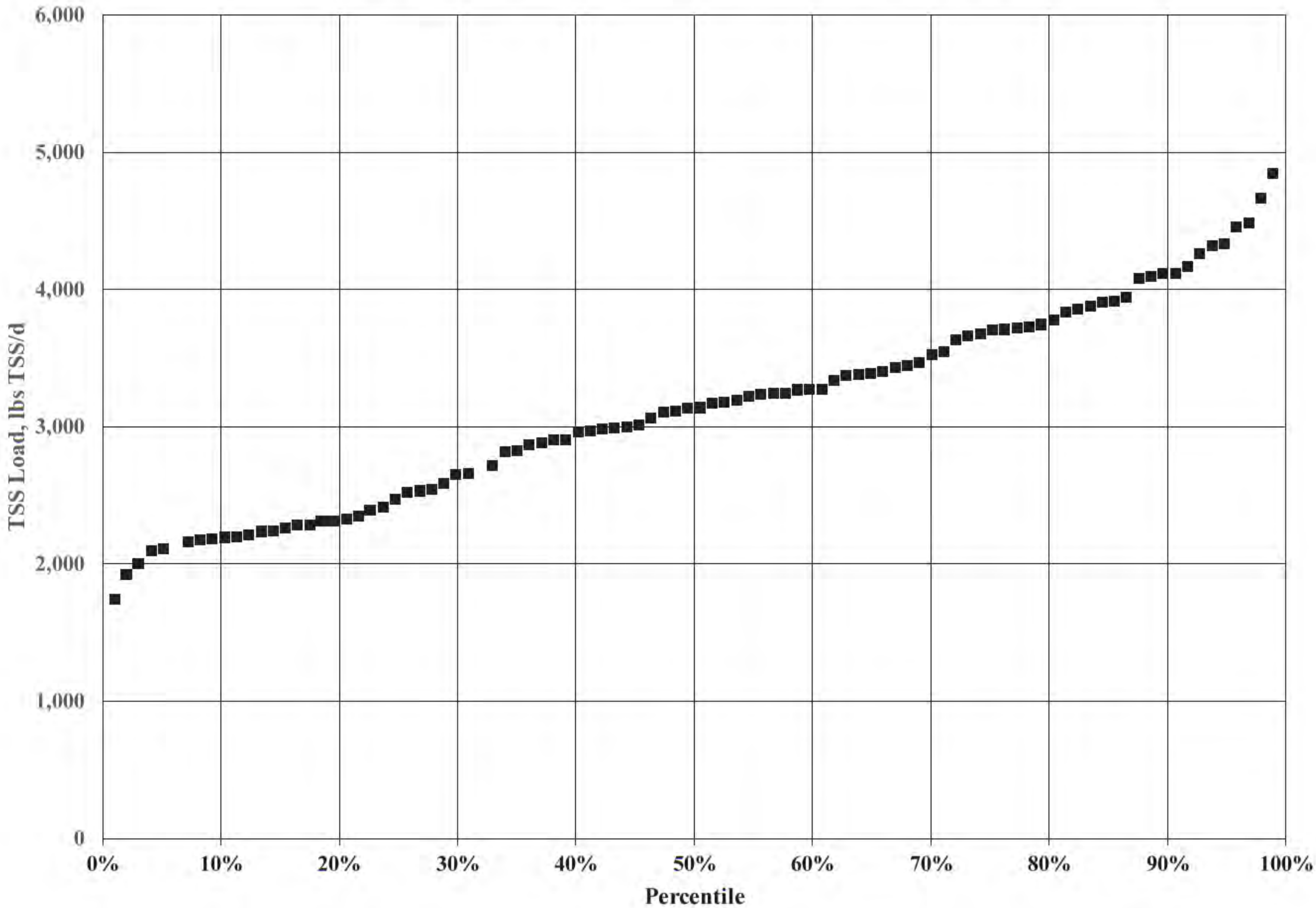


Figure B.23 Monthly Average TKN Load Percentile 2012 - 2020

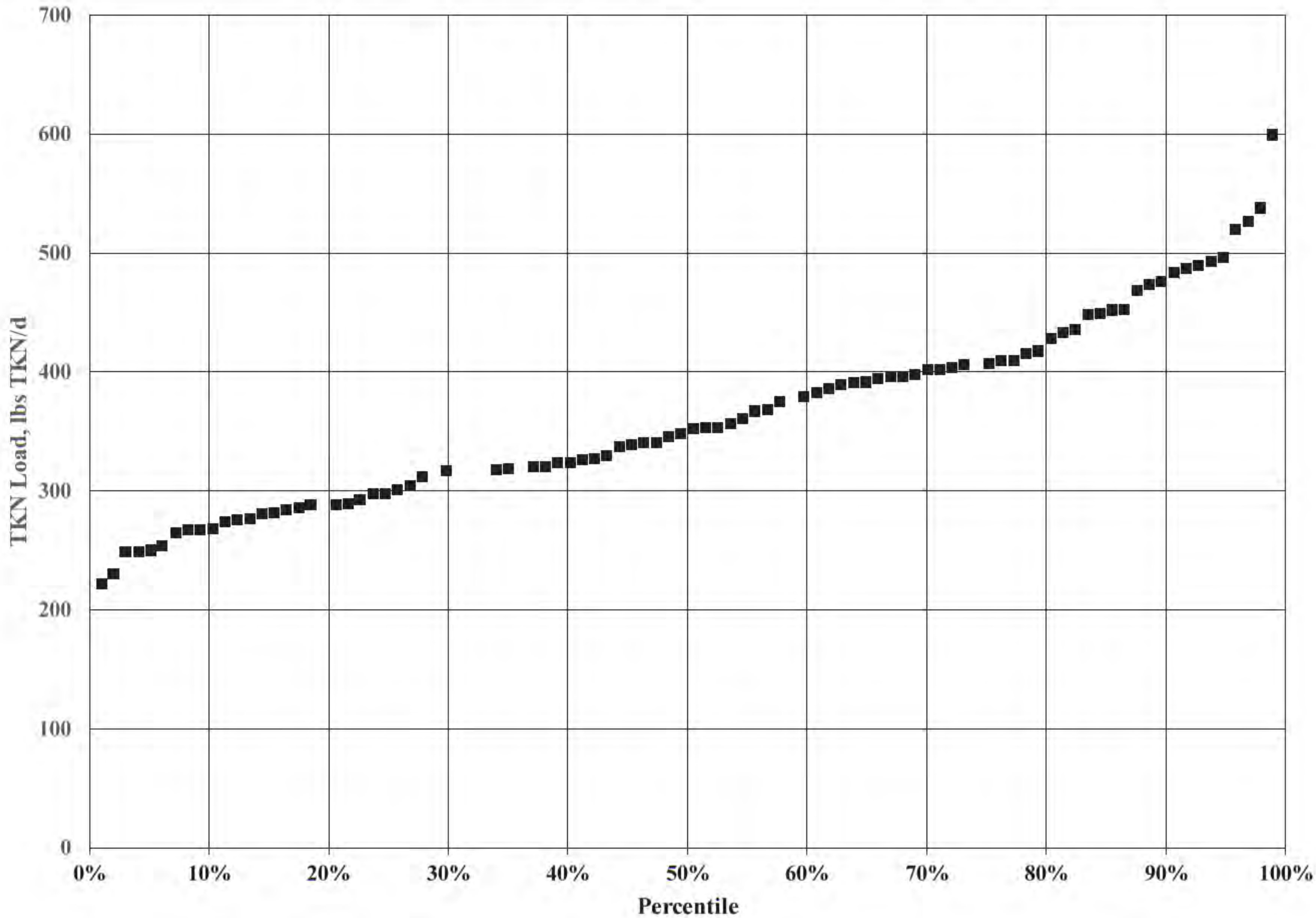
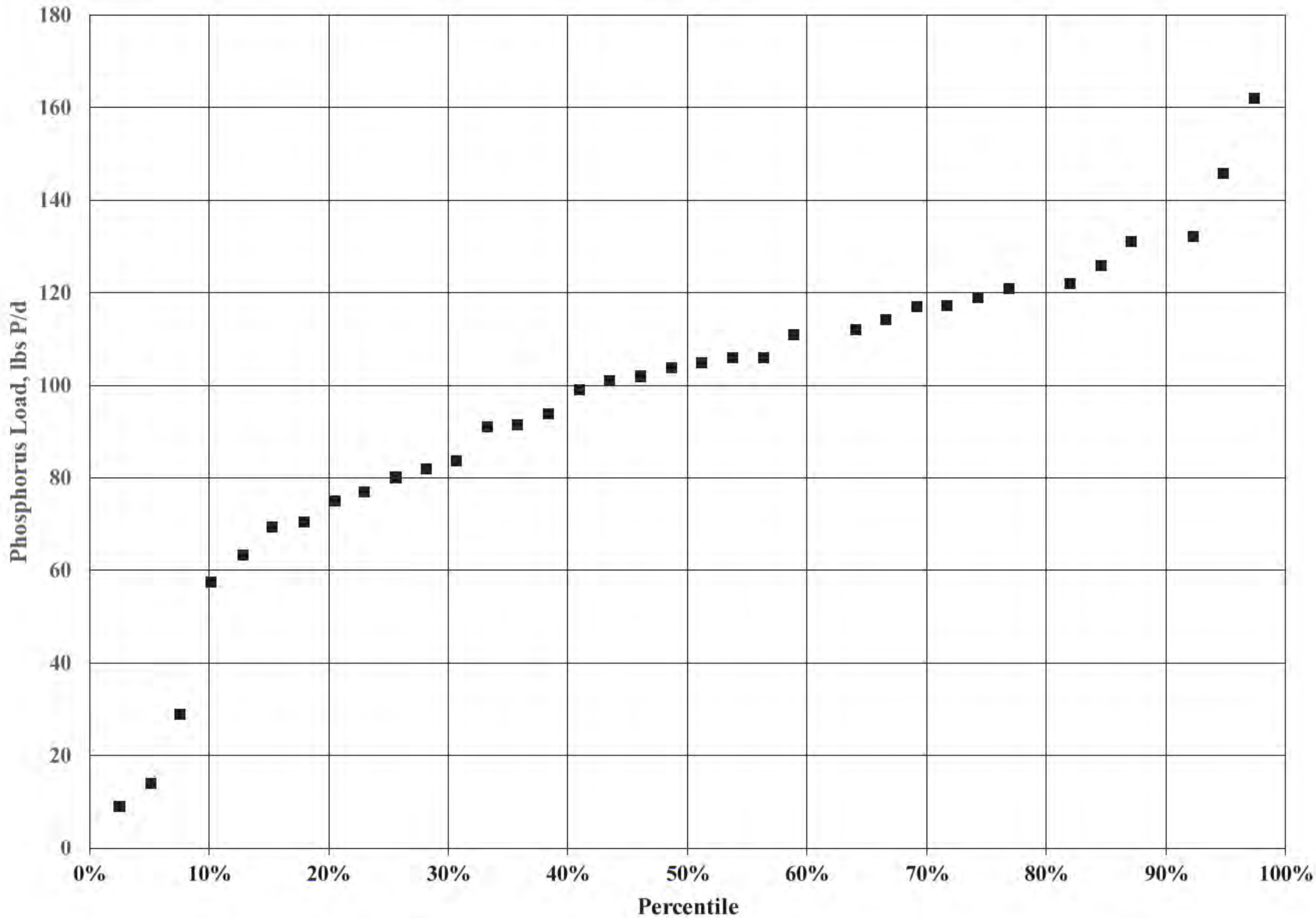


Figure B.24 Monthly Average Phosphorus Load Percentile 2017 - 2020



Appendix C: Population Projection

MEMO

TO: Gregory L Sindt P.E., Senior Principal Environmental Engineer
Bolton & Menk, Inc.

FROM : Daniel Ortiz-Hernandez, City Manager

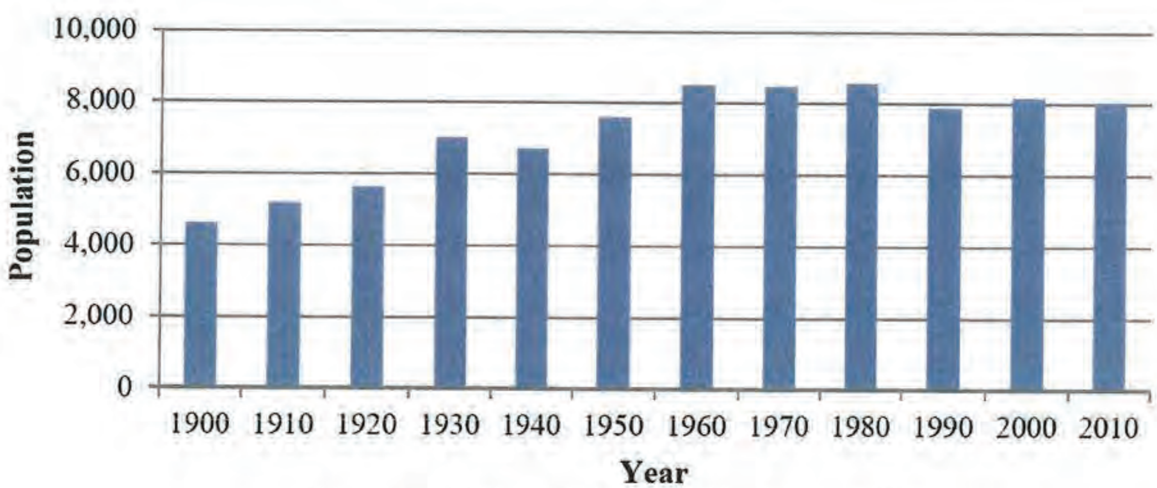
DATE: April 26, 2016

RE: Future Population Estimate for WWTP Capacity

Greg,

In consideration of the City of Webster City's future population estimates, the City has to consider not only historical trends but also recent activity that has the significant potential to impact future population estimates. Webster City experienced a steady increase in population between 1900-1960, and its population has been fluctuating since. The City's population peaked at 8,572 residents in 1980. It has generally remained stagnant at 8,000 residents or just below that level since that time. Chart 1 shows the population of Webster City for the decades 1900-2010.

Chart 1: Population of Webster City, 1900-2010



Source: State Data Center of Iowa, U.S. Census Bureau (2010)

In 2011, the City experienced the loss of major industry and employer, Electrolux. Official population estimates and documents prepared for the City, such as the most recent Comprehensive Plan and a housing study completed in 2013, anticipated that the loss of this industry and major employer would lead to a decline in City's overall population.

> *"Webster City will have slightly less than 8,000 residents by the year 2025."*
> *- A Housing Assessment and Strategy Plan for Webster City*

While the community was impacted by the changes which occurred after Electrolux left, the City's population did not experience a large rapid decline as may have been expected. The City's population did fall below 8,000 residents and recent U.S. Census figures estimate the current population to be 7,814 (July, 2015). Additionally, Electrolux's departure resulted in several large industrial properties to sit vacant and unused for several years.

CURRENT ENVIRONMENT & RECENT ACTIVITY

The City's 2013 housing assessment and strategy plan and the City's Comprehensive Plan reflected and based some of their conclusions on the circumstances the community was undergoing at the time. Since that time the City has persevered, seen businesses and industries expand, and welcomed a new industry (VeroBlue Farms). VeroBlue Farms has acquired the vacant industrial properties previously mentioned and begun their aquaculture operations in the first quarter of 2017. Employment figures for VeroBlue are estimated to reach 150 employees or more spanning three or four sites in Webster City.

In addition to VeroBlue Farms, Mary Ann's Specialty Foods is undergoing a $3,462,000.00 expansion and adding 25,000 square feet to their facilities to accommodate current demand and future growth. Mary Ann's anticipates with the expansion of adding to their current employment base consisting of over 180 employees. The project is financially supported by Mary Ann's business funds, bank loans, the City of Webster City's revolving loan program, and a recently awarded loan from USDA's REDL&G program.

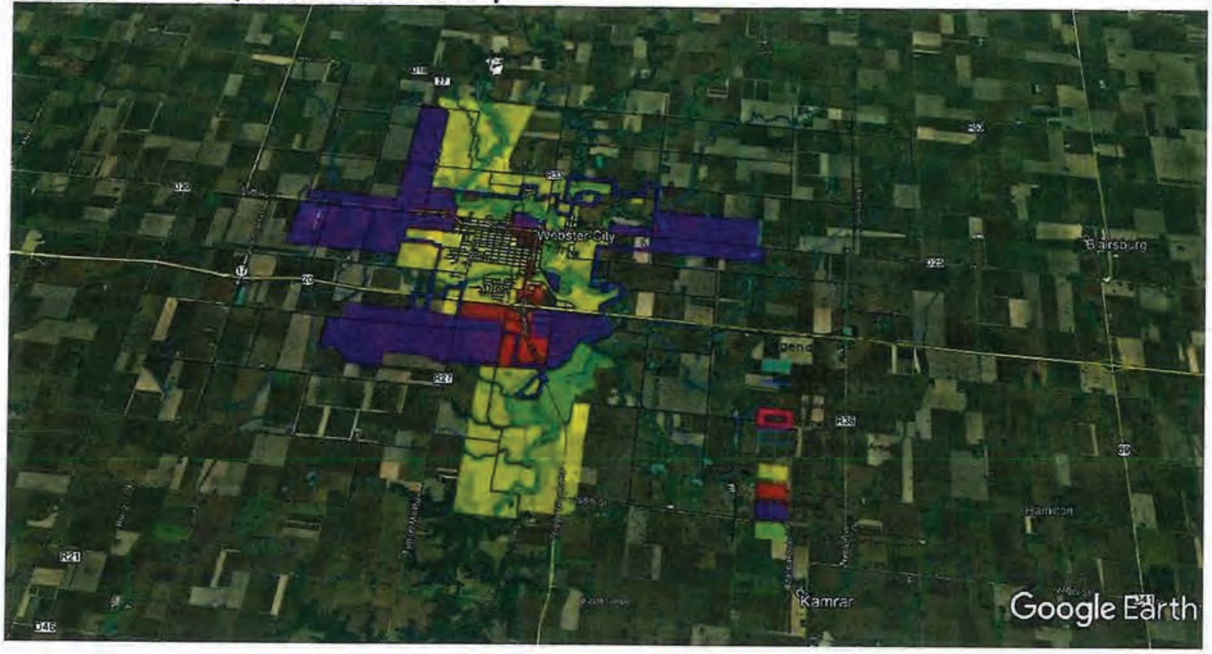
Beyond the City's corporate limits, the City will be impacted in future years by the upcoming development of Prestage Farms and their new pork processing plant in Wright County. The plant will have a major impact on the region and will be located just 11 miles from Webster City. An economic impact report developed by Goss & Associates Economic Solutions estimates in the first five years of operation the plant will have an impact of 922 direct jobs and support on average a total of 3,781 ancillary jobs each year within a ten (10) county area. Hamilton County is expected to have the 2nd largest impact. Webster City is not only the county seat for Hamilton County but also the largest and closest community in the County to the site of Prestage Farms' processing plant. Webster City also has the closest critical access hospital.

All the local and regional activities have begun to stimulate interest and residential growth. In 2016, the City of Webster City began to finalize engineering plans to complete its 5th and 6th addition of our self-developed housing subdivision known as Brewer Creek. Construction of the project began April 17, 2017 with an anticipated completion of fifty-three (53) residential lots by the fall of 2017. In addition, the City has processed requests for permits for single family residential homes to be constructed in existing subdivisions, and also been engaged with private developers seeking to build single and multi-family housing units. These discussions encompass projects ranging from a new subdivision ranging from one hundred residential lots, to twenty-four and sixty-unit apartment complexes. These projects and potential prospects are at varying degrees in the development process from preliminary site plan, to recently approved variance with the Board of Adjustment, to awaiting on application response for additional financial incentives from other entities.

FUTURE GROWTH ESTIMATE: 11,609 RESIDENTS

Given that current population forecasts do not account for activity that has occurred in the last eighteen (18) months in which industries have established or plan new operations in Webster City or the surrounding area, the City must calculate future population estimates that factors recent commercial/industrial activity and future residential developments. The map below taken from the City's most recent comprehensive plan depicts the City's future land use patterns, both within the corporate limits and the City's two (2) mile zoning jurisdiction. Current and future residential land use are depicted in yellow, industrial land use in purple, and commercial land use in red.

City of Webster City: Future Land Use Map



The City estimates there to be approximately 550 acres of land to be developed for residential purposes within the next twenty-five (25) years. This is based on current residential development projects, such as those previously mentioned, and areas where future residential development will likely occur based on the proximity of infrastructure, amenities, traffic corridors, suitable terrain, available land, and previously studied areas. This estimate does not represent 100% build out of all current and future residential land use.

The City's housing study and strategic plan from 2013 noted that Brewer Creek subdivision expansion of 5th through 7th additions would take up approximately 45 acres would provide about 135 lots at a gross density of three (3) units per acre. Under the current climate, and the City's development of Brewer Creek 5th and 6th addition will generate 53 residential lots. Combined with the potential of a twenty-unit and sixty-unit apartment complexes, they would total 137 housing units developed on thirty-five (35) acres at a density of approximately four (4) housing units per acre.

For planning purposes, the City utilizes the lesser figure of three (3) housing units per acre. Build out of 550 acres would then total approximately 1,650 housing units. Based on an average household size of 2.3, 1,650 new housing units over twenty-five years would result in a population increase of an estimated 3,795 new residents. The City's estimated population would then be 11,609 residents.

Gregory Sindt

From: City Manager Webster City Ia <citymanager@webstercity.com>
Sent: Thursday, April 02, 2020 4:36 PM
To: Gregory Sindt
Subject: Re: 3-18-19 Mary Anns agreement proposal.docx

Sorry for the delay, COVID-19 jas dominated my week. I can find no basis to modify the population projections previously supplied by Mr. Ortiz-Hernandez, therefore please continue to use them as the 25 year population projection.

On Wed, Mar 25, 2020 at 2:46 PM Gregory Sindt <Gregory.Sindt@bolton-menk.com> wrote:

Thanks Jeff,

Greg.

From: City Manager Webster City Ia <citymanager@webstercity.com>
Sent: Wednesday, March 25, 2020 1:56 PM
To: Gregory Sindt <Gregory.Sindt@bolton-menk.com>
Cc: Zach Chizek <zach@groveslaw.net>; Ken Wetzler <kwetzler@webstercity.com>; Tim Danielson <tdanielson@webstercity.com>
Subject: Re: 3-18-19 Mary Anns agreement proposal.docx

Gentlemen,

Please see attached documentation (provided by the City Clerk) from the March 18th 2019 Council meeting. In particular, the sixth page (not page 6 as they are not all numbered) is a signed memo from Mary Ann's and the 7th page is the projections.

Appendix D: Design Flows and Loadings

BOLTON & MENK

Real People. Real Solutions.

1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

Via Email James.Oppelt@dnr.iowa.gov

May 24, 2022

Mr. James Oppelt
Iowa Department of Natural Resources
Wallace State Office Building
502 East 9th Street
Des Moines, IA 50319-0034

RE: Webster City Wastewater Treatment Facility
Project No.: A21.119239
NPDES Discharge Permit No. 4063001
Design Flows and Loads Submittal
Waste Load Allocation Request
Revised Design Flows and Loads
Your May 18 Email

Dear Mr. Oppelt:

The following are answers to the questions in your May 18 email (copy enclosed) regarding the revised City of Webster City design flows submitted for your review on April 15, 2022:

1. Equalization Basin Design Calculations. The equalization basin design volume is based on operating the mechanical plant at a maximum daily flow equal to the AWW flow PLUS 0.50 MGD. Historical data is used in determining the storage volume required for the flow in excess of the maximum daily flow (AWW plus 0.50 MGD) to the mechanical plant. The maximum month (or maximum AWW) flow during the 2012-2019 period of data evaluation was 3.349 MGD. Therefore, 3.439 plus 0.500 MGD (3.939 MGD) was used as the maximum day flow to the mechanical plant in the model of 2012-2019 data for sizing the flow equalization basin. This approach provides the minimum basin volume required for storage of excess I/I flows while limiting the mechanical plant flow to the AWW flow plus 0.500 MGD. We used the 0.500 MGD flow in excess of AWW to reduce the required equalization basin volume. It was a trade off between much larger equalization basin volume for the extra 0.500 MGD storage versus slightly larger mechanical plant to handle the extra 0.500 MGD.

2. Mechanical Plant Design Flow Calculations with Storm Water Flow Equalization Basin. The AWW design flow to the new mechanical treatment plant is based on the projected design year AWW flows in Table 2.4 (4.586 MGD) PLUS 0.500 MGD. The maximum day design flow rate to the mechanical plant is 5.086 MGD as per Table 2.5.

3. Schedule G Flows. The April 11, 2022 revised Schedule G includes the RATED MWW design flow AFTER storm water flow equalization (5.086 MGD). As requested per your May 18 email, the Schedule G MWW design flow is revised to the design flow rate PRIOR TO flow equalization

H:\WEBC\A21119239\1_Corres\C_To Others\2022-05-23 119239 Revised Design Flows and Loads email response.docx

(9.430 MGD). See enclosed 5/23/2022 revised Schedule G. Thank you for the clarification on the Schedule G requirements regarding MWW flow data for facilities with flow equalization. The notation in line 2 of Schedule G "(with MWW wet weather flow equalization)" has been deleted. The 5.086 MGD mechanical plant maximum day design flow is included in the Facility Plan Table 2.5.

4. AWW Design Flow. The plant will be designed for the 4.586 MGD AWW flow as per Table 2.5.

5. RO Water Treatment Waste Load. There would be no BOD, TSS, TKN, or P loading from future reverse osmosis water treatment process reject water.

6. BOD Design Loads. All design loads are expressed as BOD as per DNR requirements. The Facility Plan Design Flows and Load Submittal at Page 2-2 (first paragraph) includes a statement that "DNR staff can assume for the purposes of process review and design organic loading rate that the BOD load is equivalent to the CBOD load for this facility". We used the historical CBOD raw wastewater monitoring data in the evaluation of design loads because DNR required CBOD monitoring in raw wastewater in the previous NPDES discharge permit. There is no historical raw wastewater BOD monitoring data.

Please contact me with any questions and discussion regarding this information.

Sincerely,

Bolton & Menk, Inc.

Gregory L. Sindt, P.E.
Senior Environmental Engineer

c: Daniel Ortiz-Hernandez - City Manager, City of Webster City, w/ enclosures, via email
Biridiana Bishop - Public Works Director, City of Webster City, w/ enclosures, via email
Nick Knowles - Wastewater Superintendent, City of Webster City, w/ enclosures, via email
Ryan Olive - DNR NPDES Discharge Permits Section, via email
Katie Greenstein - DNR Waste Load Allocation Section, via email
DNR Mason City Field Office, via email
Andrew Sindt, Bolton & Menk, Inc., w/ enclosures
Greg Sindt, Bolton & Menk, Inc., w/ enclosures
File, w/ enclosures

Enclosures: Schedule G, May 23, 2022 Revised
James Oppelt May 18, 2022 Email

Iowa Department of Natural Resources
Wastewater Section
Construction Permit Application
SCHEDULE G, Treatment Project Design Data
Exhibit 11C

DNR USE ONLY
Project No. ________
Permit No. ________

Date Prepared / Date Revised	Project Identity
Date Prepared 5/23/2020	City of Webster City Wastewater Treatment Facility Improvements
Date Revised 5/23/2022	

1. Project Description	New Wastewater Treatment Facility			
2. Design Flows	Present Year (2020)		Design Year (2040)	
Design Condition →	AWW (MGD)	MWW (MGD)	AWW (MGD)	MWW (MGD)
Domestic/Commercial Flow	0.93	1.56	1.068	1.068
Industrial				
Flow	0.63	0.74	0.704	0.883
Rated Flow			0.704	0.883
Other Flow (specify)	Future RO Reject	0	0.217	0.400
Infiltration/Inflow	0.80	1.80	2.597	7.079
Total				
Flow	3.30	6.00	4.586	9.430
Rated Flow	3.30	6.00	4.586	9.430

Average Dry Weather Flow (ADW):	Peak Hourly Wet Weather Flow (PHWW):	Demographic Data:
1.50 MGD (present year)	6.70 MGD (present year)	Population 7,900 (present year)
1.989 MGD (design year)	11.780 MGD (design year)	Population 11,609 (design year)

3. Organic Design Loadings		Present Year (2020)		Design Year (2040)	
Design Condition →		Max. 30 day (#/day)	Max. Day (#/day)	Max. 30 day (#/day)	Max. Day (#/day)
Domestic/Commercial	BOD_5	1,722	1,722	4,063	5,456
	TSS			5,340	8,358
	TKN	259	259	488	639
Industrial	BOD_5	2,428	2,428	3,383	5,209
	TSS			2,764	4,487
	TKN	141	141	357	516
Other (Specify)	BOD_5				
	TSS				
	TKN				
Total	BOD_5	4,150	4,150	7,446	10,665
	TSS			8,104	12,845
	TKN	400	400	845	1,155

4. Effluent Limitations		BOD_5		TSS		NH_3-N (most stringent month)		Other		Other	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
Operation Permit	mg/l										
Effluent Limits*	#/day										

*Date of Waste Load Allocation (WLA) determination: 4/11/22 Revised WLA Request

**Effluent Limitations entered shall be the more stringent value between the existing NPDES Permit and the WLA or an approved antidegradation analysis

5. Major Industrial/Commercial contributors or Significant Industrial User: (Max. Day Loadings)

Waste Contributors	Pre-Treat (Y/N)	Operation		Design Loadings						
				Flow		BOD5 #/day	Susp. Solids #/day	TKN #/day	Oil & Grease #/day	#/day
		Hrs/ Day	Days/ Week	Ave. MGD	Max. MGD					
Mary Ann's Foods	Y	24	6	0.100	0.140	400	300	80		
Webster City Meats	Y	24	6	0.070	0.110	1,000	250	80		

6. SCHEDULE G SUPPLEMENTAL CHECKLIST MUST ACCOMPANY THIS FORM

Gregory Sindt

From: Oppelt, James <james.oppelt@dnr.iowa.gov>
Sent: Wednesday, May 18, 2022 1:53 PM
To: Andrew Sindt; Gregory Sindt
Subject: Revised Flows and Loads for Webster City

Andrew and Greg:

I'm confused about what the proposed mechanical plant capacity is (I'm not sure we discussed in the first version). Reading one portion of the document I'm thinking that the mechanical plant capacity (after EQ) is 5.086 MGD because you say that increasing this decreases required EQ capacity. But then it goes on to describe using 3.939 MGD in the model used to size EQ.

On Sch. G the design MWW is 9.43 MGD but the "rated" flow is 5.086 MGD, which makes me think your concept of rated flow is different from that we give in the instructions in Sch. G. That is, our "rated" flow in Sch. G is a flow where we consider industrial wastewater production shifts as opposed to just the average industrial flows. Rated flows on Sch. G should always be equal to or higher than the "Flow". Yours is lower, which makes me think you are stating the rated flow for the mechanical facility which is a different concept entirely that is not explicitly listed in Sch. G. Nowadays we try to remember to note the difference between the mechanical plant rated flow and the total flow (or "rated" flow on Sch. G) in facility plan approvals and construction permits but Sch. G is only for total raw influent values prior to EQ.

Is the AWW for the plant going to be 4.586 MGD? If so, it sounds like the plan is to provide less mechanical plant capacity than the AWW flow? We don't like to see plants sized for less than AWW even if there is EQ.

Does the proposed RO waste have any loadings to be concerned with?

To be clear, the BOD5 loads on schedule G will be what we use to verify plant capacity. Not CBOD loads.

I can probably approve the flows and loads that are on your schedule G. Some of what I am asking for here can be worked out in the FP stage, but just want to be clear before I approve these.

Thanks.

www.iowadnr.gov

JAMES C. OPPELT • Environmental Engineer, Senior
Water Quality Bureau
Iowa Department of Natural Resources
515-725-8428
502 E 9th St, Des Moines, IA 50319

IOWA DEPARTMENT OF NATURAL RESOURCES

GOVERNOR KIM REYNOLDS
LT. GOVERNOR ADAM GREGG
DIRECTOR KAYLA LYON

June 2, 2022

Daniel Ortiz-Hernandez
400 Second Street
P.O. Box 217
Webster City, IA 50595

Re: Wastewater Treatment Facility Improvements
DNR Project No. S2017-0216

Subject: Revised Flows and Loads Approval

Dear Mr. Ortiz-Hernandez:

The Iowa Department of Natural Resources has reviewed the Revised Design Flows and Loads Submittal dated May 24, 2022 for the above-referenced project. The Flows and Loads are approved.

Design Waste Loadings

Design Flows			Max 30-day Design Loadings		
ADW	1.989	MGD	BOD5	7,446	lbs./day
AWW	4.586	MGD	TSS	8,104	lbs./day
MWW	9.430*	MGD	TKN	845	lbs./day
PHWW	11.780*	MGD			

*The hydraulic capacity of the mechanical plant is 5.086 MGD after wet weather flow equalization.

Department approval does not eliminate the need for the facility to comply with all federal, state and local regulations. This department must be notified of any change in your proposal and approve the change prior to incorporation in plans and specifications.

WALLACE BUILDING, 502 E 9TH ST, DES MOINES IA 50319
Phone: 515-725-8200 www.IowaDNR.gov Fax: 515-725-8202

If you have any questions or comments concerning this project, please feel free to contact me at 515/725-8428 or email james.oppelt@dnr.iowa.gov.

Sincerely,

James C. Oppelt, P.E.
Project Manager
Wastewater Engineering Section

cc: Bolton & Menk, Inc. / Greg Sindt, P.E.
DNR Field Office 2
DNR Sewage File 6-40-63-0-01

Appendix E: Industrial Design Loads

1. Industrial Sewer User Design Loads
    - Cactus Family Farms LLC (2/27/2020)
    - Mary Ann's Specialty Foods, Inc. (10/21/2020)
    - Webster City Custom Meats, Inc. (2/13/2020)
2. Treatment Agreements (DNR Form 31 and DNR Form 542-3221)
    - Mary Ann's Specialty Foods, Inc. (3/19/2019)
    - Mertz Engineering, Inc. (3/4/2020)
    - Webster City Custom Meats, Inc. (3/1/2005)
3. Cactus Family Farms Wastewater Services Agreement (2/29/2020)
4. NaturalShrimp Wastewater Services Agreement (2/18/2021)

Note: Industrial Sewer Users will execute new Treatment Agreements prior to City Construction Permit Application submittal, after Industrial Sewer User design load allocations are finalized.

City of Webster City
Industrial Sewer User Design Loads

Industrial User: Cactus Family Farms LLC (Truck Wash)

	Design Year 2025	Design Year 2030
Flow, gallons per day		
Monthly Average	375,000	375,000 (MONTHLY TOTAL FLOW)
Maximum Day	21,000	21,000
CBOD, lbs per day		
Monthly Average	256	256
Maximum Daily	435	435
Total Kjeldahl Nitrogen, lbs per day		
Monthly Average	28	28
Maximum Daily	47	47
Total Suspended Solids, lbs per day		
Monthly Average	338	338
Maximum Daily	576	576

Prepared by: ROD LEMAN

Signed: [signature]

Date: 2/27/2020

City of Webster City
Industrial Sewer User Design Loads

Industrial User: Mary Ann's Specialty Foods, Inc.

	Short Term thru 2025	Design Year 2030
Flow, gallons per day		
Monthly Average	.080 mg	.100 mg
Maximum Day	.110 mg	.140 mg
CBOD, lbs per day		
Monthly Average	600	600
Maximum Daily	900	900
Total Kjeldahl Nitrogen, lbs per day		
Monthly Average	50	60
Maximum Daily	80	80
Total Suspended Solids, lbs per day		
Monthly Average	200	200
Maximum Daily	300	300

Prepared by: Pam Netzel

Signed: [signature]

Date: 10/21/2020

City of Webster City
Industrial Sewer User Design Loads

Industrial User: Webster City Custom Meats, Inc.

	Design Year 2025	Design Year 2030
Flow, gallons per day		
Monthly Average	70,000	70,000
Maximum Day	110,000	110,000
CBOD, lbs per day		
Monthly Average	500	500
Maximum Daily	1000	1000
Total Kjeldahl Nitrogen, lbs per day		
Monthly Average	40	40
Maximum Daily	80	80
Total Suspended Solids, lbs per day		
Monthly Average	100	100
Maximum Daily	250	250

Oil + Grease ?

Prepared by: Connie Ingraham

Signed: Connie Ingraham

Date: 2/13/2020

IOWA DEPARTMENT OF NATURAL RESOURCES
TREATMENT AGREEMENT FORM

DNR USE ONLY
NPDES NO.
IND. CONT. AGREEMENT NO.
REPLACES AGREEMENT NO.

NOTICE

A properly executed Treatment Agreement must be submitted by the industrial user not less than one hundred eighty (180) days before the new significant industrial user proposes to discharge into a wastewater disposal system. Any proposed expansion, production increase, or process modification that may result in any change to a previous Treatment Agreement requires execution of a new Treatment Agreement.

SIGNIFICANT INDUSTRIAL USER		SYSTEM RECEIVING WASTE	
NAME Mary Ann's Specialty Foods, Inc.		NAME City of Webster City	
MAILING ADDRESS PO Box 696; Webster City, IA 50595		MAILING ADDRESS PO Box 217; Webster City, IA 50595-0217	
AUTHORIZED REPRESENTATIVE Pamela Netzel	PHONE NO. 515-832-4740	AUTHORIZED REPRESENTATIVE Kent Harfst	PHONE NO. 515-832-9139

CERTIFICATION OF INDUSTRIAL USER

I am the duly authorized representative for the significant industrial user identified above and state that the proposed discharge to the system receiving waste identified above shall not exceed the quantities listed on page two of this form after:

EFFECTIVE DATE March 19, 2019
Expiration Date February 28, 2022

I further assure that notice of any anticipated increase in pollutants contributed shall be given to the owner of the system identified above sufficiently in advance of such increase to allow this contributor to submit a new treatment agreement to the Department of Natural Resources no later than sixty days in advance of the increase or change.

TYPED OR PRINTED NAME	TITLE	SIGNATURE	DATE
Pamela Netzel	V.P. Marketing	[signature]	3/18/19

CERTIFICATION OF SYSTEM RECEIVING WASTE

I am the duly authorized representative for the facility owner named above and state that the owner agrees to accept the discharge described on page two from the contractor identified above, and accepts responsibility for providing treatment of the volume and quantities described on the reverse in accordance with the provisions of Chapter 455B, Code of Iowa, and the rules of the Department of Natural Resources. This agreement is conditioned on the industrial contributor complying with all applicable standards and requirements of the Department of Natural Resources and the United State Environmental Protection Agency. This agreement is entered for the purpose of identifying pollutants contributed and limiting the quantity contributed, and shall not otherwise be construed to affect local ordinances, sewer service agreements or fee systems entered into between the parties.

This agreement may be modified or terminated by the owner of the disposal system if additional pollutants or additional quantities or volumes of pollutants are contributed other than identified on the reverse, or because of any condition that requires either a temporary or permanent reduction or elimination of the accepted contribution.

TYPED OR PRINTED NAME	TITLE	SIGNATURE	DATE
Kent Harfst	City Manager	[signature]	3-18-19

TREATMENT AGREEMENT FORM

1. PROCESS DESCRIPTION			
SPECIFIC MANUFACTURING PROCESS Further processing meat products Bacon, ham, sausage, pulled, etc.		SIC CODES 2011	
CONSUMPTION		PRODUCTION	
PRINCIPAL RAW MATERIAL	AMOUNT CONSUMED PER DAY	PRINCIPAL PRODUCTS	AMOUNT PRODUCED PER DAY
		Meat - Further processed	100,000 lbs to 200,000 lbs

2. HOURLY MAXIMUM FLOW CONTRIBUTION	3. DAYS OF OPERATION PER WEEK	4. HOURS OF OPERATION DURING PEAK DAY OF OPERATION	5. RANGE OF pH LEVEL IN CONTRIBUTION	
			MINIMUM	MAXIMUM
	6	24 hrs	6	11

6. DESCRIPTION OF PRETREATMENT PROVIDED

DAF System
Grease Skimmer

7. DESCRIPTION OF ANY BATCH OR PERIODIC DISCHARGES

8. COMPATIBLE WASTE IN CONTRIBUTION

WASTEWATER PARAMETER	AVERAGE	MAXIMUM	WASTEWATER PARAMETER	AVERAGE	MAXIMUM
Flow (MGD)	0.080	0.110	Ammonia Nitrogen (lbs/day)		
BOD5 (lbs/day)	300	400	Oil and Grease (mg/l)	100	125
Total Suspended Solids (lbs/day)	150	250			
Total Kjeldahl Nitrogen (lbs/day)	30	40			

9. INCOMPATIBLE WASTE IN CONTRIBUTION

WASTEWATER PARAMETER	AVERAGE		MAXIMUM	
	mg/l	lbs/day	mg/l	lbs/day

IOWA DEPARTMENT OF NATURAL RESOURCES
TREATMENT AGREEMENT FORM

NOTICE	DNR USE ONLY
A properly executed Treatment Agreement must be submitted by the industrial user not less than one hundred eighty (180) days before the new significant industrial user proposes to discharge into a wastewater disposal system. Any proposed expansion, production increase, or process modification that may result in <u>any</u> change to a previous Treatment Agreement requires execution of a new Treatment Agreement.	NPDES NO. IND. CONT. AGREEMENT NO. REPLACES AGREEMENT NO.

SIGNIFICANT INDUSTRIAL USER		SYSTEM RECEIVING WASTE	
NAME **Mertz Engineering, Inc.**		NAME **City of Webster City's Water & Waste Water Treatment Plant**	
MAILING ADDRESS **PO Box 548, Webster City, Iowa 50595**		MAILING ADDRESS **PO Box 217, 400 2nd Street, Webster City, Iowa 50595**	
AUTHORIZED REPRESENTATIVE Austin Wright	PHONE NO. 515-832-2832	AUTHORIZED REPRESENTATIVE **Tim Danielson**	PHONE NO. 515-832-9146

CERTIFICATION OF INDUSTRIAL USER

I am the duly authorized representative for the significant industrial user identified above and state that the proposed discharge to the system receiving waste identified above shall not exceed the quantities listed on page two of this form after:

EFFECTIVE DATE 3/4/2020

I further assure that notice of any anticipated increase in pollutants contributed shall be given to the owner of the system identified above sufficiently in advance of such increase to allow this contributor to submit a new treatment agreement to the Department of Natural Resources no later than sixty days in advance of the increase or change.

TYPED OR PRINTED NAME	TITLE	SIGNATURE	DATE
Austin Wright	Assistant Engineer	[signature]	3/4/2020

CERTIFICATION OF SYSTEM RECEIVING WASTE

I am the duly authorized representative for the facility owner named above and state that the owner agrees to accept the discharge described on page two from the contractor identified above, and accepts responsibility for providing treatment of the volume and quantities described on the reverse in accordance with the provisions of Chapter 455B, Code of Iowa, and the rules of the Department of Natural Resources. This agreement is conditioned on the industrial contributor complying with all applicable standards and requirements of the Department of Natural Resources and the United State Environmental Protection Agency. This agreement is entered for the purpose of identifying pollutants contributed and limiting the quantity contributed, and shall not otherwise be construed to affect local ordinances, sewer service agreements or fee systems entered into between the parties.

This agreement may be modified or terminated by the owner of the disposal system if additional pollutants or additional quantities or volumes of pollutants are contributed other than identified on the reverse, or because of any condition that requires either a temporary or permanent reduction or elimination of the accepted contribution.

TYPED OR PRINTED NAME	TITLE	SIGNATURE	DATE

TREATMENT AGREEMENT FORM

1. PROCESS DESCRIPTION

SPECIFIC MANUFACTURING PROCESS	SIC CODES
Hydraulic Cylinders	3593

CONSUMPTION		PRODUCTION	
PRINCIPAL RAW MATERIAL	AMOUNT CONSUMED PER DAY	PRINCIPAL PRODUCTS	AMOUNT PRODUCED PER DAY
Steel	2,000	Hydraulic Cylinders	50

2. HOURLY MAXIMUM FLOW CONTRIBUTION	3. DAYS OF OPERATION PER WEEK	4. HOURS OF OPERATION DURING PEAK DAY OF OPERATION	5. RANGE OF pH LEVEL IN CONTRIBUTION	
			MINIMUM	MAXIMUM
250 gph	5	16	6	10

6. DESCRIPTION OF PRETREATMENT PROVIDED

None

7. DESCRIPTION OF ANY BATCH OR PERIODIC DISCHARGES

Mertz Engineering holds Hotsy waste in a reservoir until full and then is emptied into the City Sewer. Bay 1 and Bay 3 are continuously recirculated and emptied at the end of each month, simultaneously. Bay 1 and Bay 3 are emptied into the City Sewer and are kept at 5.5 pH. Bay 2 is a continuous overflow tank that empties into the City Sewer. All Bays and Hotsy are sourced from City Water.

8. COMPATIBLE WASTE IN CONTRIBUTION

WASTEWATER PARAMETER	AVERAGE	MAXIMUM	WASTEWATER PARAMETER	AVERAGE	MAXIMUM
Flow (MGD)	4,000	8,000	Ammonia Nitrogen (lbs/day)		
BOD5 (lbs/day)			Oil and Grease (mg/l)		
Total Suspended Solids (lbs/day)					
Total Kjeldahl Nitrogen (lbs/day)					

9. INCOMPATIBLE WASTE IN CONTRIBUTION

WASTEWATER PARAMETER	AVERAGE		MAXIMUM	
	mg/l	lbs/day	mg/l	lbs/day
Cadmium	0.07	0.0023	0.11	0.0037
Chromium	1.71	0.0570	2.77	0.0924
Copper	2.07	0.0691	3.38	0.1128
Lead	0.43	0.0143	0.69	0.0230
Nickel	2.38	0.0794	3.98	0.1328
Silver	0.24	0.0080	0.43	0.0143
Zinc	1.48	0.0494	2.61	0.0871
Cyanide	0.15	0.0050	1.2	0.0400
TTO, Total			2.13	0.0711

IOWA DEPARTMENT OF NATURAL RESOURCES
OPERATION PERMIT APPLICATION
TREATMENT AGREEMENT

DNR USE
IOWA FACILITY NO.
IND. CONT. AGREEMENT NO.
REPLACES AGREEMENT NO.

NOTICE

A properly executed Treatment Agreement must be submitted by the contributor not less than one hundred eighty (180) days before the new major contributing industry proposes to discharge into a wastewater disposal system. Any proposed expansion, production increase or process modification that may result in <u>any</u> change to a previous Treatment Agreement requires execution of a new Treatment Agreement.

MAJOR INDUSTRIAL CONTRIBUTOR		SYSTEM RECEIVING WASTE	
NAME Webster City Custom Meats Inc.		NAME City of Webster City	
MAILING ADDRESS 1611 East 2nd St. Webster City,IA.		MAILING ADDRESS P.O. Box 217 Webster City, IA.	
AUTHORIZED REPRESENTATIVE Dean Bowden	PHONE NO. 515-832-1130	AUTHORIZED REPRESENTATIVE Teresa Rotschafer	PHONE NO. 515-832-9151

CERTIFICATION OF CONTRIBUTING INDUSTRY

I am the duly authorized representative for the major industrial contributor identified above and state that the proposed discharge to the system receiving waste identified above shall not exceed the quantities listed on page two of this form after

EFFECTIVE DATE
March 1, 2005

I further assure that notice of any anticipated increase in pollutants contributed shall be given to the owner of the system identified above sufficiently in advance of such increase to allow this contributor to submit a new treatment agreement to the Department of Natural Resources not later than sixty days in advance of the increase or change.

TYPED OR PRINTED NAME	TITLE	SIGNATURE	DATE
Dean Bowden	President	Dean Bowden	4-8-05

CERTIFICATION OF SYSTEM RECEIVING WASTE

I am the duly authorized representative for the facility owner named above and state that the owner agrees to accept the discharge described on page two from the contractor identified above, and accepts responsibility for providing treatment of the volume and quantities described on the reverse in accordance with the provisions of Chapter 455B, Code of Iowa, and the rules of the Department of Natural Resources. This agreement is conditioned on the industrial contributor complying with all applicable standards and requirements of the Department of Natural Resources and the United State Environmental Protection Agency. This agreement is entered for the purpose of identifying pollutants contributed and limiting the quantity contributed, and shall not otherwise be construed to affect local ordinances, sewer service agreements or fee systems entered into between the parties.

This agreement may be modified or terminated by the owner of the disposal system if additional pollutants or additional quantities or volumes of pollutants are contributed other than identified on the reverse, or because of any condition that requires either a temporary or permanent reduction or elimination of the accepted contribution.

TYPED OR PRINTED NAME	TITLE	SIGNATURE	DATE
Teresa Rotschafer	City Manager	Teresa Rotschafer	4-5-05

DNR Form 31
(Sept. 87)
542-3221

1. PROCESS DESCRIPTION

SPECIFIC MANUFACTURING PROCESS	SIC CODE
Meat Processing Plant	2013

CONSUMPTION		PRODUCTION	
PRINCIPAL RAW MATERIAL	AMOUNT CONSUMED PER DAY	PRINCIPAL PRODUCTS	AMOUNT PRODUCED PER DAY
Process Meats	N/A	Ham Bacon Sausage	80,000 lbs.

2. HOURLY MAXIMUM FLOW CONTRIBUTION	3. DAYS OF OPERATION PER WEEK	4. HOURS OF OPERATION DURING PEAK DAY OF OPERATION	5. RANGE OF pH LEVEL IN CONTRIBUTION	
			MINIMUM	MAXIMUM
25,000 gal	6	24	6.00	11.0

6. DESCRIPTION OF PRETREATMENT PROVIDED

Skimming System

7. DESCRIPTION OF ANY BATCH OR PERIODIC DISCHARGES

N/A

8. COMPATIBLE WASTE IN CONTRIBUTION

WASTEWATER PARAMETER	AVERAGE	MAXIMUM	WASTEWATER PARAMETER	AVERAGE	MAXIMUM
Flow (MGD)	0.080	0.110	Ammonia Nitrogen (lbs/day)		
BOD_5 (lbs/day)	600	900	Oil and Grease (mg/l)	100	125
Total Suspended Solids (lbs/day)	200	300			
Total Kjeldahl Nitrogen (lbs/day)	60	80			

9. INCOMPATIBLE WASTE IN CONTRIBUTION

WASTEWATER PARAMETER	AVERAGE		MAXIMUM	
	mg/l	lbs/day	mg/l	lbs/day

DNR Form 31
(Sept. 87)
542-3221

RESOLUTION NO. 2020 - 063

AUTHORIZING THE CITY OF WEBSTER CITY TO ENTER INTO A WASTEWATER SERVICES AGREEMENT WITH CACTUS FAMILY FARMS, LLC, WEBSTER CITY, IOWA

WHEREAS, Cactus Family Farms LLC. desires a Wastewater Services Agreement to discharge Wastewater into Webster City's sanitary sewer system; and

WHEREAS, the City agrees to accept the discharge as described in said Wastewater Service Agreement; and

WHEREAS, the City Council has reviewed said form of agreement.

NOW THEREFORE BE IT RESOLVED by the City Council of the City of Webster City, Iowa that the Mayor and City Clerk are hereby authorized and directed to enter into a Wastewater Services Agreement for Cactus Family Farms LLC, to discharge wastewater into the City's sanitary sewer system.

BE IT FURTHER RESOLVED that said agreement is hereby approved upon being executed by both parties.

Passed and adopted this 16th day of March, 2020.

John Hawkins, Mayor

ATTEST:

Karyl K. Bonjour, City Clerk

This Wastewater Services Agreement ("**Agreement**") is made as of February 29, 2020 by the City of Webster City, Iowa, a Municipal Corporation, ("**City**") and Cactus Family Farms, LLC, an Iowa Corporation, ("**Company**"). City and Company may be referred to individually as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, Company owns and operates a truck washing facility ("**Facility**") at 1709 2nd Street, Webster City, Iowa and is a contributor of Sewage (defined below) to the Sewage System (defined below); and

WHEREAS, Company's Sewage discharge exceeds the concentrations of residential and commercial amounts allowed under Webster City's Code of Ordinances.

WHEREAS, City owns, operates and maintains a municipal Sewage System (defined below); and

WHEREAS, this Agreement has been prepared to set forth the mutual understanding of the parties with respect to the Company's use as a Customer of the Sewage System,

NOW, THEREFORE, in consideration of the recitals and the mutual promises set forth herein, and for other good and valuable consideration, the receipt of which is hereby acknowledged, the parties agree as follows.

DEFINITIONS

For purposes of this Agreement, the following terms have the following meanings:

"Permitted Discharge" shall mean the following amounts of and characteristics of Sewage that Company is entitled to discharge from the Facility to the Sewage System:

Monthly Average:	
Flow	0.008417 MGD
CBOD	120 lbs/d
TSS	120 lbs/d
TKN	15 lbs/d
Daily Maximum	
Flow	0.015 MGD
CBOD	160 lbs/d
TSS	150 lbs/d
TKN	19 lbs/d
pH minimum 5.5	
pH maximum 9.0	

"CBOD" means Carbonaceous 5-Day Biochemical Oxygen Demand as measured by the test method set forth in the latest edition of Standard Methods for the Examination of Water and Wastewater.

"Claims" shall have the meaning set forth in Section 4.4.

"Company" shall mean **Cactus Family Farms, LLC** as set forth in the Recitals above.

"Customer" shall mean any person responsible for the production of Sewage which is directly or indirectly discharged into the Sewage System.

"Daily Maximum" for mass discharge (lbs/d) parameters shall mean the maximum amount of a contaminant discharged in a 24-hour period as calculated using the concentration of the contaminant in a 24-hour flow proportional sample and the total 24-hour discharge volume.

"Daily Maximum" for concentration (mg/L) parameters and pH shall mean the concentration of a grab sample collected at any time during a 24-hour period.

"Extended Coverage" shall have the meaning set forth in Section 4.2.

"FOG" and "Oil Grease" mean Fats, Oil, and Grease as set forth in EPA Method 1664, Revision A (N-Hexane Extractable Material).

"Facility" shall have the meaning set forth in the Recitals, above.

"IDNR" shall mean the Iowa Department of Natural Resources.

"Industrial Wastes" shall mean the liquid wastes from industrial manufacturing processes, trade, or business as distinct from Sanitary Sewage.

"Laws" shall mean all applicable federal, state and local statutes, codes, rules, regulations, ordinances, agency policies, orders, and case law, all as may be amended.

"MGD" shall mean million gallons per day.

"mg/L" shall mean milligrams per liter concentration.

"Monthly Average" shall mean the average of all monitoring data for a specific Sewage parameter collected during a calendar month.

"Notices" shall have the meaning set forth in Section 7.12.1.

"NPDES Permit" shall mean the National Pollutant Discharge Elimination System permit issued to the City pursuant to section 402 of the Clean Water Act, as amended, 33. U.S.C. 1251, et seq., and as further provided in implementing regulations 40 C.F.R 403.3(b) and 403.3(1).

"pH" shall mean the logarithm of the reciprocal of the weight of hydronium ion concentration in moles per liter of solution.

"Records" shall have the meaning set forth in Section 7.2.

"Sanitary Sewage" shall mean sewage discharging from the sanitary conveniences of dwellings (including apartment houses and hotels), office buildings, factories or institutions, and free from storm, surface water, and Industrial Waste.

"Sewage" shall mean a combination of the water-carried wastes from business buildings, institutions, and industrial establishments of Company, together with such ground, surface, and storm waters as may be present.

"Sewage System" shall mean all facilities for collecting, pumping, treating, and disposing of sewage.

"Sewer" shall mean a pipe or conduit for carrying sewage.

"Sewer Service Charges" shall mean any and all charges, rates or fees levied against and payable by Customers, as consideration for the servicing of Customers by the Sewage System.

"Sewage System" shall mean all land, buildings, machinery, interceptor and sewers and other tangible and intangible property, whether now or later owned or used or added by City for collecting, transmitting, treating or disposing of Sewage.

"Successor" shall have the meaning set forth in Section 7.3.

"Standard Methods" shall mean the most current edition *Standard Methods for the Examination of Water and Wastewater* jointly published by the American Public Health Association, the American Water Works Association, and the Water Environment Federation.

"TKN" means Total Kjeldahl Nitrogen as measured by the test method set forth in the latest edition of Standard Methods for the Examination of Water and Wastewater.

"TSS" means Total Suspended Solids as measured by the test method set forth on the latest edition of Standard Methods for the Examination of Water and Wastewater.

"User" shall mean any individual, partnership, corporation or other organization or entity, public or private, that discharges Sewage to the Sewage System.

1. COLLECTION AND TREATMENT

1.1. <u>Company Right to Discharge and City Obligation to Take and Treat Allocated Share</u>

1.1.1. The Company shall have the right to discharge its Permitted Discharge to the Sewage System.

1.1.2. The City shall use all reasonable best efforts to continually receive and treat Company's Permitted Discharge without interruption to the Company.

1.1.3. Both Parties acknowledge that if ever in the future the loadings to the Sewage System reach or exceed its rated design capacity, the City may reduce Company's Permitted Discharge if required for maintaining compliance with City's NPDES Permit or if required by the Iowa Department of Natural Resources. City will provide Company thirty (30) days written notice of any reduction in Permitted Discharge and this Agreement will be amended to reflect the revised Permitted Discharge as established by the City.

2. USER CHARGES

2.1. Sewer User Charges

2.1.1. **Sewer User Rates and Sewer Service Charges**. The Company shall pay City Sewer Service Charges for receiving and treating Sewage discharged by Company to the Sewage System in accordance with the rates established by City ordinances. The City shall monitor the sewer fund and review rates annually. Rates shall be established in an equitable manner that results in rates for all users that are based on the costs of taking and treating the Sewage.

2.1.2. **Monthly Surcharges**. A monthly surcharge for concentration of any parameter greater than the surcharge concentrations stated below, if any, shall be calculated by applying the average monthly concentration for each parameter to the total metered Sanitary Sewage discharge volume from Company's monitoring station for that month. Surcharge concentrations are established by City ordinance.

2.1.3. **Modification of User Rates**. In the event IDNR requires the City to comply with more stringent discharge limits from its wastewater treatment facility than are contained in its NPDES Permit in effect on the date of this Agreement, the City specifically reserves the right to modify the user charge rates to the Company in order to provide appropriate user charges for (a) any additional costs reasonably incurred for the construction, amortization of debt service, operation, maintenance or replacement of such additional facilities; and (b) any change to operation of the Sewage System as may be necessary to meet such more stringent limits for adequate treatment of Permitted Discharge. The City shall determine those costs in accordance with a fair and equitable methodology for allocation of costs to service charge parameters (flow and CBOD and TSS surcharge) and notify the Company of them at least 180 days before such rates shall go into effect. Unless the Agreement is terminated pursuant to the terms set forth herein, the Company shall pay any increases in user fees from the effective date of the increase until the effective date of termination.

2.1.4. **Termination**. In the event the Company does not agree with the imposition or allocation of such additional user fees for modifications to the Sewage System as may be required for compliance with more stringent discharge limits, the Company shall notify the City in writing of its disagreement within 60 days after receiving the City's proposed new sewer user rates. In that event, the Company may terminate this Agreement on or before the last to occur of (a) the effective date of the more stringent discharge limits, or (b) after the period which is reasonably necessary for Company to construct alternative wastewater treatment facilities.

3. MONITORING, TESTING AND CALCULATION OF AVERAGES

3.1. __Monitoring__. Company shall maintain equipment in proper operating condition approved by the City for the purpose of sampling/monitoring the Company's Sewage prior to discharge to the City's Sewage System. City approval of sampling locations/equipment shall not be unreasonably withheld. Company shall install and maintain a permanent monitoring station near and prior to the point of discharging to City's Sewage System within one (1) year of this Agreement. Company shall also install a temporary monitoring station located inside the Facility within thirty (30) days of this Agreement. Said temporary monitoring station shall include a magnetic flow meter and twenty-four (24) hour flow proportional composite sampler.

3.2. __Laboratory Testing__. City shall maintain a laboratory at the City's wastewater treatment plant or retain an independent laboratory (Laboratory), certified by the State of Iowa, for analyses of compliance monitoring samples of the Company's Sanitary Sewage. City shall deliver samples to the Laboratory for analysis and provide reports of analyses to Company. Company shall pay the cost of analysis by the Laboratory. In addition, Company may collect split samples for analyses at its own laboratory at the Company's cost.

3.3. __Sampling__

3.3.1. The Company shall provide daily flows to City on a monthly basis. In the event wastewater flow measurements are not available, the wastewater discharge volumes for billing purposes shall be estimated by multiplying the current month water use volume by the previous month ratio of total monthly wastewater discharge volume to total monthly water usage volume.

3.3.2. The Company sampling equipment shall collect 24-hour flow proportional-composite samples that are representative of the Sewage discharged by Company over the monitoring period. Representative grab samples shall be collected for Oil and Grease and pH analyses. A representative number of non-production day samples shall be collected each month. For example, if there are two (2) non-production or low flow days per week, then approximately $2/7^{th}$ or twenty-nine percent (29%) of the samples collected during the month shall be on non-production days. If four (4) samples are collected per month, then one (1) sample per month would be collected during a non-production day. If there is no flow or extremely low flow when composite sampler operation is not practicable, a grab sample may be collected from the discharge end of the settling tank.

3.3.3. Monthly average mass discharge used for compliance monitoring purposes shall be calculated as the average of the mass discharges for every day that a sample was collected and analyzed.

3.3.4. City shall allow split samples for Company use upon Company's request. Samples shall be split at time of collection by the person collecting them. Company shall pay any expense for analysis of such split samples.

3.4. Sampling Methods and Laboratory Analyses Disputes.

In the event of unresolvable disputes regarding discharge monitoring methods or laboratory analyses, the City and Company shall jointly retain an independent Professional Engineer for technical evaluation of the issues. Cost of independent Professional Engineer's services shall be equally shared between City and Company. The independent Professional Engineer shall be selected by agreement of the City and Company, which agreement by either party shall not be unreasonably withheld. If the issues are not resolved after the evaluation by the independent Professional Engineer, then the matter shall be addressed as per Section 4.2 -Dispute Resolutions of this Agreement.

4. COMMUNICATIONS AND DISPUTE RESOLUTION

4.1. Regular Meetings. Each August during the term of the Agreement, or as otherwise agreed to by the Parties, the Parties shall meet to discuss any issues that have arisen in the Parties' respective performance under the Agreement, and any other issues arising from or related to the Agreement, including the user rates.

4.2. Dispute Resolution. Claims and disputes of any type between City and Company arising out of or relating to this Agreement which cannot be resolved by negotiation between the parties shall be decided by an alternative dispute resolution process ("**ADR Process**"). Either party may give written notice to the other of its desire to resolve a claim or dispute by the ADR Process. The Parties shall negotiate in good faith to determine the type of ADR Process to be utilized. If the type of ADR Process is not agreed upon by the parties within thirty (30) days after said party's notice, then arbitration in accordance with the rules of the American Arbitration Association, shall be the type of ADR Process utilized. An award resulting from the ADR Process shall be final and judgment may be entered upon such an award in accordance with applicable law in a court having appropriate jurisdiction. Any award made as a result of the ADR Process shall not include punitive damages. Unless this Agreement is terminated in accordance with its terms, or the Parties otherwise agree in writing, the Parties shall continue to perform during the ADR Process or other litigation between the parties.

5. TERM OF AGREEMENT

5.1. Term. Except as otherwise provided herein, this Agreement shall become effective on March 1, 2020 and the term shall be for one (1) year. This Agreement may be extended by mutual agreement of the Parties after one (1) year. City agrees to not assess any penalties under the City ordinances during the initial thirty (30) day period following execution of this Agreement and the Company beginning to discharge its Permitted Discharge into the City's Sewage System. This is to provide opportunity for Company to evaluate monitoring data and implement any modifications to its operations as may be required to maintain compliance with the Permitted Discharge. Following said initial thirty

(30) day period, the City shall begin to assess any applicable penalties to Company as outlined in the City ordinances.

5.2. **Right to Terminate**

5.2.1. The City and Company shall have the right to terminate this Agreement pursuant to this section, Sections 2.1.4 and 6.6 herein.

5.2.2 Company shall have the right to terminate this Agreement if it closes the production operations.

6. MISCELLANEOUS PROVISIONS

6.1. Non-Compliance. In the event Company's discharge exceeds its Permitted Discharge or violates the City's sewer user ordinances, the City may impose penalties and take additional enforcement actions as provided by City ordinances.

6.2. Recordkeeping. City shall keep books, records and accounts in which complete entries of all transactions and costs relating to the Sewage System and Sewage System shall be kept (**"Records"**) for a minimum of three years. The Records shall, at reasonable times during City's regular business hours, be available for inspection and copying by Company at Company's expense.

6.3. Assignment. In the event Company should sell, transfer, merge or reorganize Company or its property or shares, the obligations and benefits of this Agreement shall pass through to the surviving company, purchaser or assignee, as the case may be, (**"Successor"**) and this Agreement shall remain in full force and effect and be binding on the Successor. Company shall notify City of such transfer and Successor shall notify City of any significant changes to its Sewage characteristics.

6.4. Authority. City and Company each warrant it has the right, title and authority to enter into this Agreement and to perform all its obligations hereunder, and that all approvals necessary for it to enter into and fully perform this Agreement have been obtained.

6.5. Entire Agreement. This Agreement and all exhibits hereto constitute the entire agreement between the parties pertaining to the subject matters hereof and supersede all negotiations, preliminary agreements and all prior or contemporaneous discussions and understandings of the parties in connection with the subject matters hereof.

6.6. Severability. In the event any provision of this Agreement is held invalid, illegal or unenforceable, in whole or in part, the remaining provisions of this Agreement shall not be affected thereby and shall continue to be valid and enforceable. In the event any provision of this Agreement is held to be unenforceable as written, but enforceable if modified, then such provision shall be deemed to be amended to such extent as shall be necessary for such provision to be enforceable and it shall be enforced to that extent. Provided, however, if the result of any provision of this Agreement being held invalid, illegal or unenforceable, in whole or in part, or if the result of any provision of this

Agreement being deemed amended, would be a limitation on Company's Permitted Discharge or an increase in charges by the City to the Company for treatment of the Permitted Discharge, Company shall have a right to terminate this Agreement upon thirty (30) days written notice to the City, effective on the date specified in that notice.

6.7. **No Waiver; Modifications**. No failure or delay on the part of any Party in exercising any right, power or remedy hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such right, power or remedy preclude any other or further exercise thereof or the exercise of any other right, power or remedy. No amendment, modification, supplement, termination or waiver of or to any provision of this Agreement, nor consent to any departure therefrom, shall be effective unless the same shall be in writing and signed by or on behalf of both parties.

6.8. **Headings**. Headings in this Agreement are provided for convenience of reference only, and shall not be considered a part hereof for purposes of interpreting or applying this Agreement, and such titles or captions do not define, limit, extend, explain or describe the scope or extent of this Agreement or any of its terms or conditions.

6.9. **Agreement Conflicts**. In the event of any conflict between this Agreement and the provisions of any other agreement between City and Company or with City ordinances or resolutions, the provisions of this Agreement shall control and any conflicting provisions of other agreements are hereby amended to conform to the provisions of this Agreement.

6.10. **Construction**. Both parties have participated equally in the preparation and approval of this Agreement. No provision of this Agreement shall be construed more strongly against either Party regardless of who was more responsible for its preparation.

6.11. **Governing Law**. This Agreement shall be governed by and construed in accordance with the laws of the State of Iowa. The penalty provisions of this Agreement do not limit the right of either party to enforce the terms of this Agreement in law or in equity.

6.12. **Notice**

6.12.1. All notices, demands, requests, and other communications desired or required to be given hereunder ("**Notices**"), shall be in writing and shall be given by: (i) hand delivery to the address for Notices; (ii) delivery by overnight courier service to the address for Notices; or (iii) sending the same by United States mail, postage prepaid, certified mail, return receipt requested, addressed to the address for Notices.

6.12.2. All Notices shall be deemed given and effective upon the earlier to occur of: (i) the hand delivery of such Notice to the address for Notices; (ii) one business day after the deposit of such Notice with an overnight courier service by the time deadline for next day delivery addressed to the address for Notices; or (iii) three business days after depositing the Notice in the United States mail as set forth in (a) above. All Notices shall be addressed to the following addresses:

If to City, to: City of Webster City
P.O. Box 217
400 Second Street
Webster City, IA 50595
Phone: 515-832-9151
Attn: City Manager

If to Company, to: Cactus Family Farms, LLC
c/o Brown Winick Law
666 Grand Ave., Ste 2000
Des Moines, IA 50309
Attn: Michael R. Blaser

or to such other persons or at such other places as any party hereto may by Notice designate for service of Notices.

6.13. **Reservation of Rights**. Neither this Agreement, nor any portion of it, is intended to limit the right of the City to adopt, enforce or amend ordinances that are a proper exercise of the City's legislative powers.

6.14. **Rule of Construction**. This Agreement is intended to be consistent with the ordinances and resolutions of the City, and shall be so construed. City represents and warrants that this Agreement is not inconsistent with the ordinances and resolutions of the City.

6.15. **No Third-Party Rights/Remedies**. This Agreement is not intended and shall not be construed to confer upon any person or entity other than the Parties hereto any rights or remedies hereunder.

6.16. **Signatories Authorized**. Each of the undersigned representatives of the Parties certifies that he or she is authorized to enter into the terms and conditions of this Agreement and to execute and legally bind such Party to this document.

7. EXHIBITS

The following Exhibits are attached to and made part of this Agreement:

NO EXHIBITS

IN WITNESS WHEREOF, the Parties have duly executed this Agreement as of the day first above written.

CITY OF WEBSTER CITY, IOWA	CACTUS FAMILY FARMS, LLC
By: [signature]	By: [signature]
John Hawkins, Mayor	Its: SVP
Attest: [signature] Karyl Bonjour, City Clerk	

STATE OF IOWA, COUNTY OF HAMILTON: ss

On this 29th day of February 2020, before me, the undersigned a Notary Public in and for the said State, personally appeared Heath Wilson, to me personally known, who being by me duly sworn, did say that he is the SVP of Cactus Family Farms, LLC; that (a) no seal has been procured by said Corporation, and that the said instrument was signed on behalf of said Corporation by authority of its Board of Directors; and that the said SVP, as such Officer, acknowledged the execution of said instrument to be the voluntary act and deed of said Corporation, by it and by them voluntarily executed.

[signature]
Notary Public in and for the State of Iowa.

BEKAH SCHOOLER
Notary Public, State of Texas
Comm. Expires 12-21-2020
Notary ID 130939412

RESOLUTION NO. 2021 - 052

AUTHORIZING THE CITY OF WEBSTER CITY, IOWA TO ENTER INTO WASTEWATER SERVICES AGREEMENT WITH NATURALSHRIMP INC., LA COSTE, TEXAS, LOCATED AT 401 DES MOINES STREET, WEBSTER CITY, IOWA

WHEREAS, the Company, NaturalShrimp Inc., 833 County Road 583, La Coste, Texas, desires a Wastewater Services Agreement to discharge wastewater into Webster City's sanitary sewer system; and

WHEREAS, the City agrees to accept the discharge as described on said Wastewater Services Agreement; and

WHEREAS, the City Council has reviewed said form of agreement.

NOW THEREFORE BE IT RESOLVED by the City Council of the City of Webster City, Iowa that the Mayor and City Clerk are hereby authorized and directed to enter into a Wastewater Services Agreement for NaturalShrimp Inc., to discharge wastewater into the City's sanitary sewer system.

BE IT FURTHER RESOLVED that said agreement is hereby approved upon being executed by both parties.

Passed and adopted this 15th day of February, 2021.

Brian Miller, Mayor Pro Tem

ATTEST:

Karyl K. Bonjour, City Clerk

WASTEWATER SERVICES AGREEMENT

As of February 15, 2021

by and between

City of Webster City, Iowa

and

NaturalShrimp, Inc.

This Wastewater Services Agreement ("**Agreement**") is made as of February ___, 2021 by the City of Webster City, Iowa, a municipal corporation, ("**City**") and NaturalShrimp, Inc., a Texas Corporation, ("**Company**"). City and Company may be referred to individually as a "Party" and collectively as the "Parties."

RECITALS

WHEREAS, Company plans to begin operating a shrimp production facility ("**Facility**") in Webster City and is a contributor of Sewage (defined below) to the Sewage System (defined below); and

WHEREAS, City owns, operates and maintains a municipal Sewage System (defined below); and

WHEREAS, this Agreement has been prepared to set forth the mutual understanding of the parties with respect to the Company's use as a Customer of the Sewage System,

NOW, THEREFORE, in consideration of the recitals and the mutual promises set forth herein, and for other good and valuable consideration, the receipt of which is hereby acknowledged, the parties agree as follows.

DEFINITIONS

For purposes of this Agreement, the following terms have the following meanings:

"Permitted Discharge" shall mean the following amounts of and characteristics of Sewage that Company is entitled to discharge from the Facility to the Sewage System:

Monthly Average:	
Flow	0.024 MGD
CBOD	166 lbs/d
TSS	100 lbs/d
TKN	18 lbs/d
Oil & Grease (HEM)	100 mg/L
Daily Maximum	
Flow	0.024 MGD
CBOD	208 lbs/d
TSS	150 lbs/d
TKN	20 lbs/d
Oil & Grease (HEM)	100 mg/L
pH minimum 5.5	
pH maximum 9.0	

"CBOD" means Carbonaceous 5-Day Biochemical Oxygen Demand as measured by the test method set forth in the latest edition of Standard Methods for the Examination of Water and Wastewater.

"Claims" shall have the meaning set forth in Section 4.4.

"Company" shall mean NaturalShrimp, Inc. as set forth in the Recitals above.

"Customer" shall mean any person responsible for the production of Sewage which is directly or indirectly discharged into the Sewage System.

"Daily Maximum" for mass discharge (lbs/d) parameters shall mean the maximum amount of a contaminant discharged in a 24-hour period as calculated using the concentration of the contaminant in a 24-hour flow proportional sample and the total 24-hour discharge volume.

"Daily Maximum" for concentration (mg/L) parameters and pH shall mean the concentration of a grab sample collected at any time during a 24-hour period.

"Extended Coverage" shall have the meaning set forth in Section 4.2.

"FOG" and "Oil Grease" mean Fats, Oil, and Grease as set forth in EPA Method 1664, Revision A (N-Hexane Extractable Material).

"Facility" shall have the meaning set forth in the Recitals, above.

"IDNR" shall mean the Iowa Department of Natural Resources.

"Industrial Wastes" shall mean the liquid wastes from industrial manufacturing processes, trade, or business as distinct from Sanitary Sewage.

"Laws" shall mean all applicable federal, state and local statutes, codes, rules, regulations, ordinances, agency policies, orders, and case law, all as may be amended.

"MGD" shall mean million gallons per day.

"mg/L" shall mean milligrams per liter concentration.

"Monthly Average" shall mean the average of all monitoring data for a specific Sewage parameter collected during a calendar month.

"Notices" shall have the meaning set forth in Section 7.12.1.

"NPDES Permit" shall mean the National Pollutant Discharge Elimination System permit issued to the City pursuant to section 402 of the Clean Water Act, as amended, 33. U.S.C. 1251, et seq., and as further provided in implementing regulations 40 C.F.R 403.3(b) and 403.3(1).

"pH" shall mean the logarithm of the reciprocal of the weight of hydronium ion concentration in moles per liter of solution.

"Records" shall have the meaning set forth in Section 7.2.

"Sanitary Sewage" shall mean sewage discharging from the sanitary conveniences of dwellings (including apartment houses and hotels), office buildings, factories or institutions, and free from storm, surface water, and Industrial Waste.

"Sewage" shall mean a combination of the water-carried wastes from business buildings, institutions, and industrial establishments of Company, together with such ground, surface, and storm waters as may be present.

"Sewage System" shall mean all facilities for collecting, pumping, treating, and disposing of sewage.

"Sewer" shall mean a pipe or conduit for carrying sewage.

"Sewer Service Charges" shall mean any and all charges, rates or fees levied against and payable by Customers, as consideration for the servicing of Customers by the Sewage System.

"Sewage System" shall mean all land, buildings, machinery, interceptor and sewers and other tangible and intangible property, whether now or later owned or used or added by City for collecting, transmitting, treating or disposing of Sewage.

"Successor" shall have the meaning set forth in Section 7.3.

"Standard Methods" shall mean the most current edition *Standard Methods for the Examination of Water and Wastewater* jointly published by the American Public Health Association, the American Water Works Association, and the Water Environment Federation.

"TKN" means Total Kjeldahl Nitrogen as measured by the test method set forth in the latest edition of Standard Methods for the Examination of Water and Wastewater.

"TSS" means Total Suspended Solids as measured by the test method set forth on the latest edition of Standard Methods for the Examination of Water and Wastewater.

"User" shall mean any individual, partnership, corporation or other organization or entity, public or private, that discharges Sewage to the Sewage System.

1. COLLECTION AND TREATMENT

1.1. Company Right to Discharge and City Obligation to Take and Treat Allocated Share

1.1.1. The Company shall have the right to discharge its Permitted Discharge to the Sewage System.

1.1.2. The City shall use all reasonable best efforts to continually receive and treat Company's Permitted Discharge without interruption to the Company, subject to the provisions outlined herein.

1.1.3. The Company may transfer or sell any unused portion of its Permitted Discharge to another User provided Company receives the City's prior written consent which shall not be unreasonably withheld. If a portion of Company's Permitted Discharge is transferred to another User, City shall enter into an agreement with the other User that is similar to this Agreement and this Agreement shall be amended for revising Company's Permitted Discharge.

1.1.4. The City is obligated to receive and treat the Permitted Discharge from Company for life of Agreement, subject to the provisions outlined herein. The City may not transfer, re-allocate, or reduce any portion of Company's Permitted Discharge without Company's prior written consent, unless outlined herein.

2. USER CHARGES

2.1. Sewer User Charges

2.1.1. Sewer User Rates and Sewer Service Charges. The Company shall pay City Sewer Service Charges for receiving and treating Sewage discharged by Company to the Sewage System in accordance with the rates established by City ordinances. The City shall monitor the sewer fund and review rates annually. Rates shall be established in an equitable manner that results in rates for all users that are based on the costs of taking and treating the Sewage.

2.1.2. Monthly Surcharges. A monthly surcharge for concentration of any parameter greater than the surcharge concentrations stated below, if any, shall be calculated by applying the average monthly concentration for each parameter to the total metered Sanitary Sewage discharge volume from Company's monitoring station for that month. Surcharge concentrations are established by City ordinance.

2.1.3. Modification of User Rates. In the event IDNR requires the City to comply with more stringent discharge limits from its wastewater treatment facility than are contained in its NPDES Permit in effect on the date of this Agreement, the City specifically reserves the right to modify the user charge rates to the Company in order to provide appropriate user charges for (a) any additional costs reasonably incurred for the construction, amortization of debt service, operation, maintenance or replacement of such additional facilities; and (b) any change to operation of the Sewage System as may be necessary to meet such more stringent limits for adequate treatment of Permitted Discharge. The City shall determine those costs in accordance with a fair and equitable methodology for allocation of costs to service charge parameters (flow and CBOD and TSS surcharge) and notify the Company of them at least 180 days before such rates shall go into effect. Unless the Agreement is terminated pursuant to the terms set forth herein, the Company shall pay any increases in user fees from the effective date of the increase until the effective date of termination.

2.1.4. **Termination**. In the event the Company does not agree with the imposition or allocation of such additional user fees for modifications to the Sewage System as may be required for compliance with more stringent discharge limits, the Company shall notify the City in writing of its disagreement within 60 days after receiving the City's proposed new sewer user rates. In that event, the Company may terminate this Agreement on or before the last to occur of (a) the effective date of the more stringent discharge limits, or (b) after the period which is reasonably necessary for Company to construct alternative wastewater treatment facilities.

3. MONITORING, TESTING AND CALCULATION OF AVERAGES

3.1. **Monitoring**. Company shall maintain equipment in proper operating condition approved by the City for the purpose of sampling/monitoring the Company's Sewage prior to discharge to the City's Sewage System. City approval of sampling locations/equipment shall not be unreasonably withheld.

3.2. **Laboratory Testing**. City shall maintain a laboratory at the City's wastewater treatment plant or retain an independent laboratory (Laboratory), certified by the State of Iowa, for analyses of compliance monitoring samples of the Company's Sanitary Sewage. The Laboratory shall be selected by agreement of the City and Company, which agreement by either party shall not be unreasonably withheld. City shall deliver samples to the Laboratory for analysis, pay the cost of analysis, and provide reports of analyses to Company. Company may collect split samples for analyses at its own laboratory at the Company's cost.

3.3. **Sampling**

3.3.1. The Company shall provide daily flows to City on a monthly basis. In the event wastewater flow measurements are not available, the wastewater discharge volumes for billing purposes shall be estimated by multiplying the current month water use volume by the previous month ratio of total monthly wastewater discharge volume to total monthly water usage volume.

3.3.2. The Company sampling equipment shall collect 24-hour flow proportional-composite samples that are representative of the Sewage discharged by Company over the monitoring period. Representative grab samples shall be collected for Oil and Grease and pH analyses.

3.3.3. Monthly average mass discharge used for compliance monitoring purposes shall be calculated as the average of the mass discharges for every day that a sample was collected and analyzed.

3.3.4. City shall allow split samples for Company use upon Company's request. Samples shall be split at time of collection by the person collecting them. Company shall pay any expense for analysis of such split samples.

3.4. Sampling Methods and Laboratory Analyses Disputes.

In the event of unresolvable disputes regarding discharge monitoring methods or laboratory analyses, the City and Company shall jointly retain an independent Professional Engineer for technical evaluation of the issues. Cost of independent Professional Engineer's services shall be equally shared between City and Company. The independent Professional Engineer shall be selected by agreement of the City and Company, which agreement by either party shall not be unreasonably withheld. If the issues are not resolved after the evaluation by the independent Professional Engineer, then the matter shall be addressed as per Section 5.2 -Dispute Resolutions of this Agreement.

4. OTHER CITY OBLIGATIONS

4.1. Operation in Efficient and Economical Manner. The City shall operate the Sewage System and Sewage System in an efficient and economic manner, in accordance with sound wastewater industry practices, complying with all applicable Laws.

4.2. Maintain insurance. The City shall procure and maintain the following insurance coverages: (1) loss or damage to the Sewage System and Sewage System by fire, windstorm, explosion, and all other hazards and perils now or at any time hereafter covered by a standard "Extended Coverage" insurance endorsement in an amount equal to the full insurable value of the Sewage System and Sewage System; (2) public liability insurance with policy limits of at least $1,000,000 and coverage for any and all personal injury, property damage, or other damages sustained or claimed to have been sustained in connection with the Sewage System, and the operation or failure to operate the Sewer System and the Sewage System; and (3) any and all other insurance coverage in types and limits that are typically maintained by private or public entities conducting similar operations. All insurance shall be procured with companies licensed to do business in the State of Iowa and shall be maintained for the term of this Agreement. Upon request by the Company, the City shall provide the Company certificates of coverage under all insurance policies.

4.3. Obligation to Repair or Replace. If all or any portion of the Sewer System or Sewage System is damaged or destroyed by fire or other casualty, the City, unless prohibited by federal or state law shall repair or replace the damaged or destroyed facility(ies) and shall expend all amounts received by the City by reason of such damage or destruction toward the cost of performing such repairs or replacements.

4.4. Release and Indemnification. The City shall release, defend and hold harmless the Company, its directors, officers, partners, shareholders, members, managers, owners, agents, employees, guests, invitees, and representatives, or any of them, from and against all civil claims, orders, suits, liabilities, judgments, demands, actions, causes of action, penalties, fines losses, costs, damages and expenses, including reasonable attorneys and consultant fees ("Claims") arising out of or related to (directly or indirectly) to the operation or failure of the Sewer System or Sewage System and the City's non-compliance with its NPDES Permit. This release and indemnification obligation shall not apply to the negligence or intentional or willful misconduct of the Company but only to the extent of such divisible or allocable share directly attributed to such negligence or intentional or willful misconduct.

5. COMMUNICATIONS AND DISPUTE RESOLUTION

5.1. Regular Meetings. Each August during the term of the Agreement, or as otherwise agreed to by the Parties, the Parties shall meet to discuss any issues that have arisen in the Parties' respective performance under the Agreement, and any other issues arising from or related to the Agreement, including the user rates.

5.2. Dispute Resolution. Claims and disputes of any type between City and Company arising out of or relating to this Agreement which cannot be resolved by negotiation between the parties shall be decided by an alternative dispute resolution process ("ADR Process"). Either party may give written notice to the other of its desire to resolve a claim or dispute by the ADR Process. The Parties shall negotiate in good faith to determine the type of ADR Process to be utilized. If the type of ADR Process is not agreed upon by the parties within thirty (30) days after said party's notice, then arbitration in accordance with the rules of the American Arbitration Association, shall be the type of ADR Process utilized. An award resulting from the ADR Process shall be final and judgment may be entered upon such an award in accordance with applicable law in a court having appropriate jurisdiction. Any award made as a result of the ADR Process shall not include punitive damages. Unless this Agreement is terminated in accordance with its terms, or the Parties otherwise agree in writing, the Parties shall continue to perform during the ADR Process or other litigation between the parties.

6. TERM OF AGREEMENT

6.1. Term. Except as otherwise provided herein, the term of this Agreement shall be four (4) months beginning February 1, 2021 through May 31, 2021. This Agreement may be extended by mutual agreement of the Parties after the four (4) month term.

6.2. Right to Terminate

6.2.1. The City and Company shall have the right to terminate this Agreement pursuant to this section 6.2.2, and Sections 2.1.4, 7.1 and 7.6 herein.

6.2.2. This Agreement shall terminate should Company closes the production operations.

7. MISCELLANEOUS PROVISIONS

7.1. Non-Compliance. In the event Company's discharge exceeds its Permitted Discharge or violates the City's sewer user ordinances, upon written notice of said non-compliance, should Company fail to remediate said non-compliance within forty-eight (48) hours and pay all applicable fines, penalties, and charges, or should the Company's discharge exceed its Permitted Discharge or violate the City's sewer user ordinance more than three (3) days in any given calendar year, the City shall have the right to terminate this Agreement and immediately shut off the discharge flow from the Company's production facility into the City's Sewer System by shutting off the lift station electrical panel source located adjacent to Company's said lift station and locking said lift station electrical panel source. In addition to the above-noted, should the Company's discharge exceed its Permitted Discharge or violate the City's sewer user ordinance at any time, the City may also impose penalties and take additional enforcement actions as provided by City ordinances or as provided herein. Both parties agree that the City shall not be liable for any damages or loss as a result of their actions taken herein.

7.2. Recordkeeping. City shall keep books, records and accounts in which complete entries of all transactions and costs relating to the Sewage System and Sewage System shall be kept ("Records") for a minimum of three years. The Records shall, at reasonable times during City's regular business hours, be available for inspection and copying by Company at Company's expense.

7.3. Assignment. In the event Company should sell, transfer, merge or reorganize Company or its property or shares, the obligations and benefits of this Agreement shall pass through to the surviving company, purchaser or assignee, as the case may be, ("Successor") and this Agreement shall remain in full force and effect and be binding on the Successor. Company shall notify City of such transfer and Successor shall notify City of any significant changes to its Sewage characteristics.

7.4. Authority. City and Company each warrant it has the right, title and authority to enter into this Agreement and to perform all its obligations hereunder, and that all approvals necessary for it to enter into and fully perform this Agreement have been obtained.

7.5. Entire Agreement. This Agreement and all exhibits hereto constitute the entire agreement between the parties pertaining to the subject matters hereof and supersede all negotiations, preliminary agreements and all prior or contemporaneous discussions and understandings of the parties in connection with the subject matters hereof.

7.6. Severability. In the event any provision of this Agreement is held invalid, illegal or unenforceable, in whole or in part, the remaining provisions of this Agreement shall not be affected thereby and shall continue to be valid and enforceable. In the event any provision of this Agreement is held to be unenforceable as written, but enforceable if modified, then such provision shall be deemed to be amended to such extent as shall be necessary for such provision to be enforceable and it shall be enforced to that extent. Provided, however, if the result of any provision of this Agreement being held invalid, illegal or unenforceable, in whole or in part, or if the result of any provision of this Agreement being deemed amended, would be a limitation on Company's Permitted Discharge or an increase in charges by the City to the Company for treatment of the Permitted Discharge, Company shall have a right to terminate this Agreement upon thirty (30) days written notice to the City, effective on the date specified in that notice.

7.7. <u>No Waiver; Modifications</u>. No failure or delay on the part of any Party in exercising any right, power or remedy hereunder shall operate as a waiver thereof, nor shall any single or partial exercise of any such right, power or remedy preclude any other or further exercise thereof or the exercise of any other right, power or remedy. No amendment, modification, supplement, termination or waiver of or to any provision of this Agreement, nor consent to any departure therefrom, shall be effective unless the same shall be in writing and signed by or on behalf of both parties.

7.8. <u>Headings</u>. Headings in this Agreement are provided for convenience of reference only, and shall not be considered a part hereof for purposes of interpreting or applying this Agreement, and such titles or captions do not define, limit, extend, explain or describe the scope or extent of this Agreement or any of its terms or conditions.

7.9. <u>Agreement Conflicts</u>. In the event of any conflict between this Agreement and the provisions of any other agreement between City and Company or with City ordinances or resolutions, the provisions of this Agreement shall control and any conflicting provisions of other agreements are hereby amended to conform to the provisions of this Agreement.

7.10. <u>Construction</u>. Both parties have participated equally in the preparation and approval of this Agreement. No provision of this Agreement shall be construed more strongly against either Party regardless of who was more responsible for its preparation.

7.11. <u>Governing Law</u>. This Agreement shall be governed by and construed in accordance with the laws of the State of Iowa. The penalty provisions of this Agreement do not limit the right of either party to enforce the terms of this Agreement in law or in equity.

7.12. <u>Notice</u>

7.12.1. All notices, demands, requests, and other communications desired or required to be given hereunder ("Notices"), shall be in writing and shall be given by: (i) hand delivery to the address for Notices; (ii) delivery by overnight courier service to the address for Notices; or (iii) sending the same by United States mail, postage prepaid, certified mail, return receipt requested, addressed to the address for Notices.

7.12.2. All Notices shall be deemed given and effective upon the earlier to occur of: (i) the hand delivery of such Notice to the address for Notices; (ii) one business day after the deposit of such Notice with an overnight courier service by the time deadline for next day delivery addressed to the address for Notices; or (iii) three business days after depositing the Notice in the United States mail as set forth in (a) above. All Notices shall be addressed to the following addresses:

If to City, to: City of Webster City
P.O. Box 217
400 Second Street

Webster City, IA 50595
Phone: 515-832-9151
Attn: City Manager

If to Company, to: NaturalShrimp, Inc.
c/o Tom Untermeyer
833 County Road 583
La Coste, TX 78039
Phone: 210-288-5741

or to such other persons or at such other places as any party hereto may by Notice designate for service of Notices.

7.13. Reservation of Rights. Neither this Agreement, nor any portion of it, is intended to limit the right of the City to adopt, enforce or amend ordinances that are a proper exercise of the City's legislative powers.

7.14. Rule of Construction. This Agreement is intended to be consistent with the ordinances and resolutions of the City, and shall be so construed. City represents and warrants that this Agreement is not inconsistent with the ordinances and resolutions of the City.

7.15. No Third-Party Rights/Remedies. This Agreement is not intended and shall not be construed to confer upon any person or entity other than the Parties hereto any rights or remedies hereunder.

7.16. Signatories Authorized. Each of the undersigned representatives of the Parties certifies that he or she is authorized to enter into the terms and conditions of this Agreement and to execute and legally bind such Party to this document.

8. EXHIBITS

The following Exhibits are attached to and made part of this Agreement:

NO EXHIBITS

IN WITNESS WHEREOF, the Parties have duly executed this Agreement as of the day first above written.

CITY OF WEBSTER CITY, IOWA

By: John Hawkins [signature]
John Hawkins, Mayor

Attest: Karyl K. Bonjour [signature]
Karyl Bonjour, City Clerk

NATURALSHRIMP, INC.

By: Tom Untermeyer [signature]

Its: CHIEF TECHNICAL OFFICER

11 February 15, 2021

STATE OF Texas, COUNTY OF Bexar :

On this 26th day of January 2021, before me, the undersigned a Notary Public in and for the said State, personally appeared Thomas Craig Untermeyer to me personally known, who being by me duly sworn, did say that he is the Chief Technical Officer of Natural Shrimp, Inc.; that (a) no seal has been procured by said Corporation, and that the said instrument was signed on behalf of said Corporation by authority of its Board of Directors; and that the said Chief Technical Officer as such Officer, acknowledged the execution of said instrument to be the voluntary act and deed of said Corporation, by it and by them voluntarily executed.

MICHAEL AGUIRRE
Notary Public, State of Texas
Comm. Expires 01-31-2024
Notary ID 13233896-0

Notary Public in and for the State of Texas

Appendix F: EQ Basin

Table F.1 Equalization Basin Volume Evaluation - Jan 2012 - Dec 2019 Data

City of Webster City, Iowa
Storm Water Flow Equalization Basin Evaluation

Max. Month Flow (Sept. 2018) + 0.50 MGD	**3.939**	**MGD Max. Flow to WWTP**

Date	Influent Flow From Coll. System MGD	Flows To and From EQ Basin: Discharge To Basin MGD	Plant Cap. Avail for EQ Flow MGD	Discharge From Basin MGD	Basin Volume End of Day MG	Flow to Treatment Process MGD
					0	
1-Jan-12	0.76	0	3.18	0	0	0.76
2-Jan-12	0.83	0	3.11	0	0	0.83
3-Jan-12	0.88	0	3.06	0	0	0.88
4-Jan-12	0.89	0	3.05	0	0	0.89
5-Jan-12	0.88	0	3.06	0	0	0.88
24-Dec-19	1.386	0	2.55	0	0	1.39
25-Dec-19	1.304	0	2.64	0	0	1.30
26-Dec-19	0.858	0	3.08	0	0	0.86
27-Dec-19	1.429	0	2.51	0	0	1.43
28-Dec-19	1.937	0	2.00	0	0	1.94
29-Dec-19	1.93	0	2.01	0	0	1.93
30-Dec-19	1.937	0	2.00	0	0	1.94
31-Dec-19	1.912	0	2.03	0	0	1.91

Count	2919
Mean	1.54
Max.	7.89
99th perc.	5.11
95th perc.	3.11
90th perc.	2.52

Minimum Basin Volume Required: **11.12 MG**

Figure F.1 2012 - 2019 Equalization Basin Volume

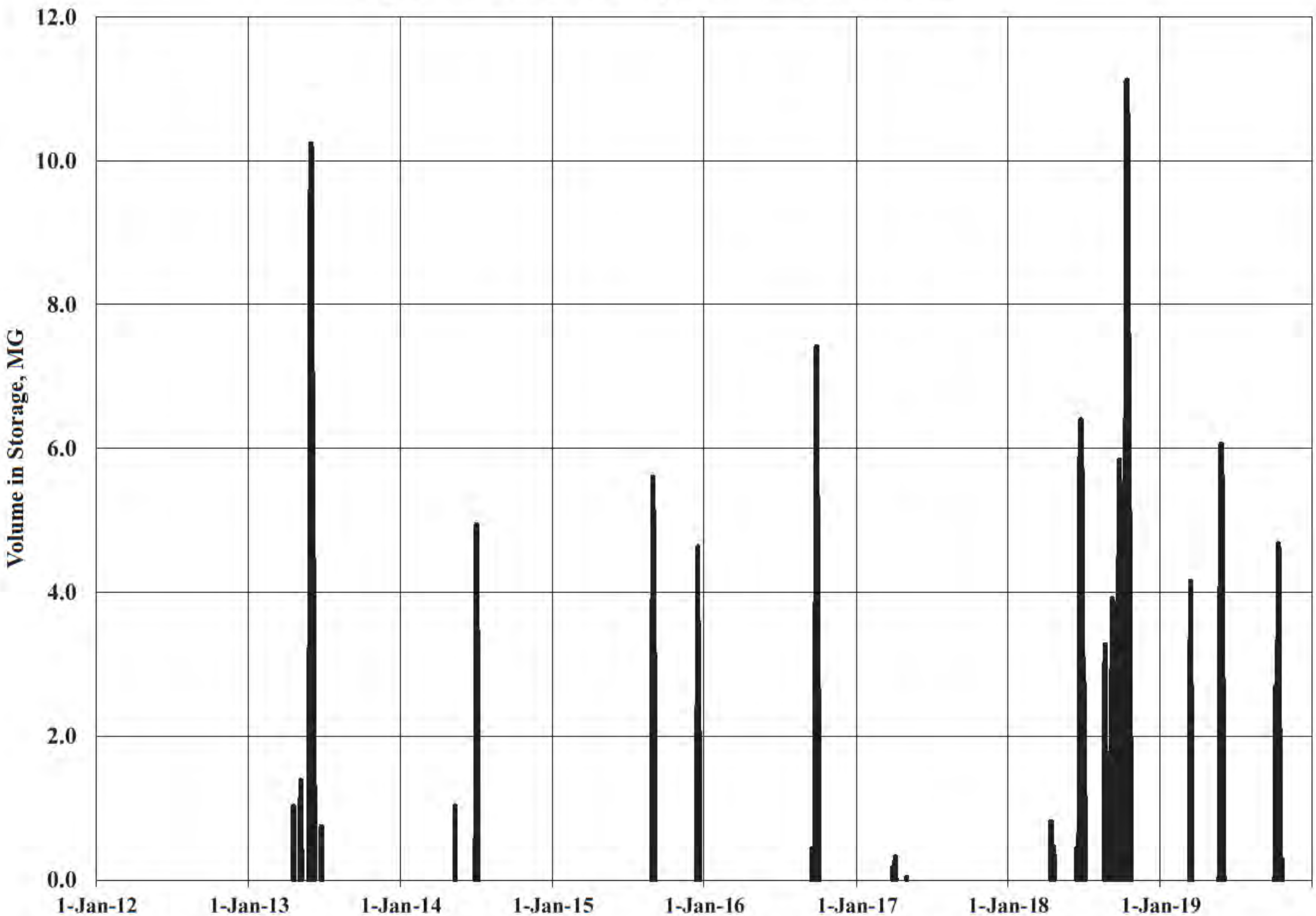


Table F.2 Equalization Basin Volume Evaluation - April 2013 - June 2013 Data

City of Webster City, Iowa
Storm Water Flow Equalization Basin Evaluation

Max. Month Flow (Sept. 2018) + 0.50 MGD | **3.939** | **MGD Max. Flow to WWTP**

Date	Influent Flow From Coll. System	Flows To and From EQ Basin: Discharge To Basin	Plant Cap. Avail for EQ Flow	Discharge From Basin	Basin Volume End of Day	Flow to Treatment Process
1-Apr-13	1.02	0	2.92	0	0	1.02
2-Apr-13	1.01	0	2.93	0	0	1.01
3-Apr-13	0.98	0	2.96	0	0	0.98
4-Apr-13	0.97	0	2.97	0	0	0.97
5-Apr-13	0.95	0	2.99	0	0	0.95
6-Apr-13	0.91	0	3.03	0	0	0.91
7-Apr-13	0.86	0	3.08	0	0	0.86
8-Apr-13	1.11	0	2.83	0	0	1.11
9-Apr-13	2.86	0	1.08	0	0	2.86
10-Apr-13	2.50	0	1.44	0	0	2.50
11-Apr-13	2.65	0	1.29	0	0	2.65
12-Apr-13	2.08	0	1.86	0	0	2.08
13-Apr-13	1.83	0	2.11	0	0	1.83
14-Apr-13	2.92	0	1.02	0	0	2.92
15-Apr-13	2.39	0	1.55	0	0	2.39
16-Apr-13	2.06	0	1.88	0	0	2.06
17-Apr-13	3.32	0	0.62	0	0	3.32
18-Apr-13	4.97	1.027	0.00	0	1.027	3.94
19-Apr-13	3.41	0	0.53	0.534	0.493	3.94
20-Apr-13	2.48	0	1.46	0.493	0	2.97
21-Apr-13	2.42	0	1.52	0	0	2.42
22-Apr-13	2.76	0	1.18	0	0	2.76
23-Apr-13	2.68	0	1.26	0	0	2.68
24-Apr-13	2.45	0	1.49	0	0	2.45
25-Apr-13	2.25	0	1.69	0	0	2.25
26-Apr-13	2.06	0	1.88	0	0	2.06
27-Apr-13	1.89	0	2.05	0	0	1.89
28-Apr-13	1.81	0	2.13	0	0	1.81
29-Apr-13	1.87	0	2.07	0	0	1.87
30-Apr-13	1.75	0	2.19	0	0	1.75
1-May-13	1.90	0	2.04	0	0	1.90
2-May-13	2.99	0	0.95	0	0	2.99
3-May-13	3.68	0	0.26	0	0	3.68
4-May-13	5.07	1.128	0.00	0	1.128	3.94
5-May-13	4.19	0.255	0.00	0	1.383	3.94
6-May-13	3.72	0	0.22	0.217	1.166	3.94
7-May-13	3.19	0	0.75	0.746	0.42	3.94
8-May-13	3.01	0	0.93	0.42	0	3.43
9-May-13	3.08	0	0.86	0	0	3.08
10-May-13	2.70	0	1.24	0	0	2.70
11-May-13	2.49	0	1.45	0	0	2.49
12-May-13	2.34	0	1.60	0	0	2.34
13-May-13	2.32	0	1.62	0	0	2.32
14-May-13	2.24	0	1.70	0	0	2.24
15-May-13	2.05	0	1.89	0	0	2.05

Table F.2 Equalization Basin Volume Evaluation - April 2013 - June 2013 Data

City of Webster City, Iowa
Storm Water Flow Equalization Basin Evaluation

Max. Month Flow (Sept. 2018) + 0.50 MGD **3.939** **MGD Max. Flow to WWTP**

Date	Influent Flow From Coll. System	Flows To and From EQ Basin: Discharge To Basin	Plant Cap. Avail for EQ Flow	Discharge From Basin	Basin Volume End of Day	Flow to Treatment Process
16-May-13	2.09	0	1.85	0	0	2.09
17-May-13	1.98	0	1.96	0	0	1.98
18-May-13	2.02	0	1.92	0	0	2.02
19-May-13	2.28	0	1.66	0	0	2.28
20-May-13	2.42	0	1.52	0	0	2.42
21-May-13	2.14	0	1.80	0	0	2.14
22-May-13	2.05	0	1.89	0	0	2.05
23-May-13	1.90	0	2.04	0	0	1.90
24-May-13	1.86	0	2.08	0	0	1.86
25-May-13	4.72	0.784	0.00	0	0.784	3.94
26-May-13	6.37	2.435	0.00	0	3.219	3.94
27-May-13	6.54	2.603	0.00	0	5.822	3.94
28-May-13	6.28	2.34	0.00	0	8.162	3.94
29-May-13	5.37	1.426	0.00	0	9.588	3.94
30-May-13	4.59	0.65	0.00	0	**10.238**	3.94
31-May-13	3.88	0	0.06	0.055	10.183	3.94
1-Jun-13	3.19	0	0.75	0.75	9.433	3.94
2-Jun-13	2.71	0	1.23	1.233	8.2	3.94
3-Jun-13	2.79	0	1.15	1.152	7.048	3.94
4-Jun-13	2.76	0	1.18	1.18	5.868	3.94
5-Jun-13	2.53	0	1.41	1.412	4.456	3.94
6-Jun-13	2.46	0	1.48	1.483	2.973	3.94
7-Jun-13	2.29	0	1.65	1.653	1.32	3.94
8-Jun-13	2.19	0	1.75	1.32	0	3.51
9-Jun-13	2.17	0	1.77	0	0	2.17
10-Jun-13	2.09	0	1.85	0	0	2.09
11-Jun-13	2.05	0	1.89	0	0	2.05
12-Jun-13	2.09	0	1.85	0	0	2.09
13-Jun-13	1.93	0	2.01	0	0	1.93
14-Jun-13	1.94	0	2.00	0	0	1.94
15-Jun-13	0.85	0	3.09	0	0	0.85
16-Jun-13	1.78	0	2.16	0	0	1.78
17-Jun-13	1.72	0	2.22	0	0	1.72
18-Jun-13	1.65	0	2.29	0	0	1.65
19-Jun-13	1.60	0	2.34	0	0	1.60
20-Jun-13	1.55	0	2.39	0	0	1.55
21-Jun-13	1.50	0	2.44	0	0	1.50
22-Jun-13	1.37	0	2.57	0	0	1.37
23-Jun-13	1.45	0	2.49	0	0	1.45
24-Jun-13	4.68	0.745	0.00	0	0.745	3.94
25-Jun-13	3.29	0	0.65	0.649	0.096	3.94
26-Jun-13	2.92	0	1.02	0.096	0	3.02
27-Jun-13	2.56	0	1.38	0	0	2.56
28-Jun-13	2.35	0	1.59	0	0	2.35
29-Jun-13	2.15	0	1.79	0	0	2.15

Table F.2 Equalization Basin Volume Evaluation - April 2013 - June 2013 Data

City of Webster City, Iowa
Storm Water Flow Equalization Basin Evaluation

Max. Month Flow (Sept. 2018) + 0.50 MGD | **3.939** | **MGD Max. Flow to WWTP**

	Influent	Flows To and From EQ Basin			Basin Volume	Flow to
Date	Flow From Coll. System	Discharge To Basin	Plant Cap. Avail for EQ Flow	Discharge From Basin	End of Day	Treatment Process
30-Jun-13	2.14	0	1.80	0	0	2.14

Figure F.2 April - June 2013 Equalization Basin Volume

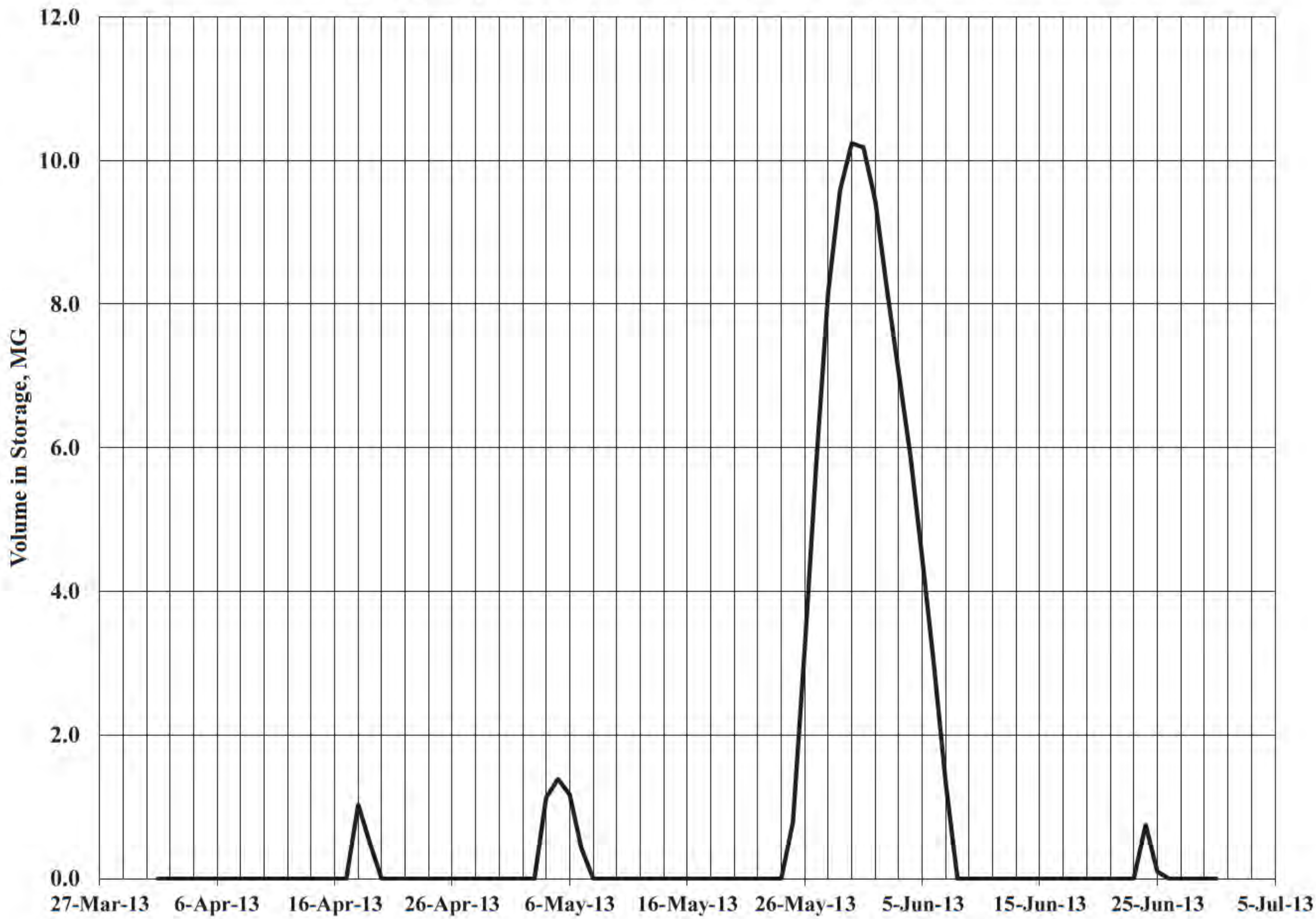


Figure F.3 April - June 2013 Influent Flow with Equaliztion Basin

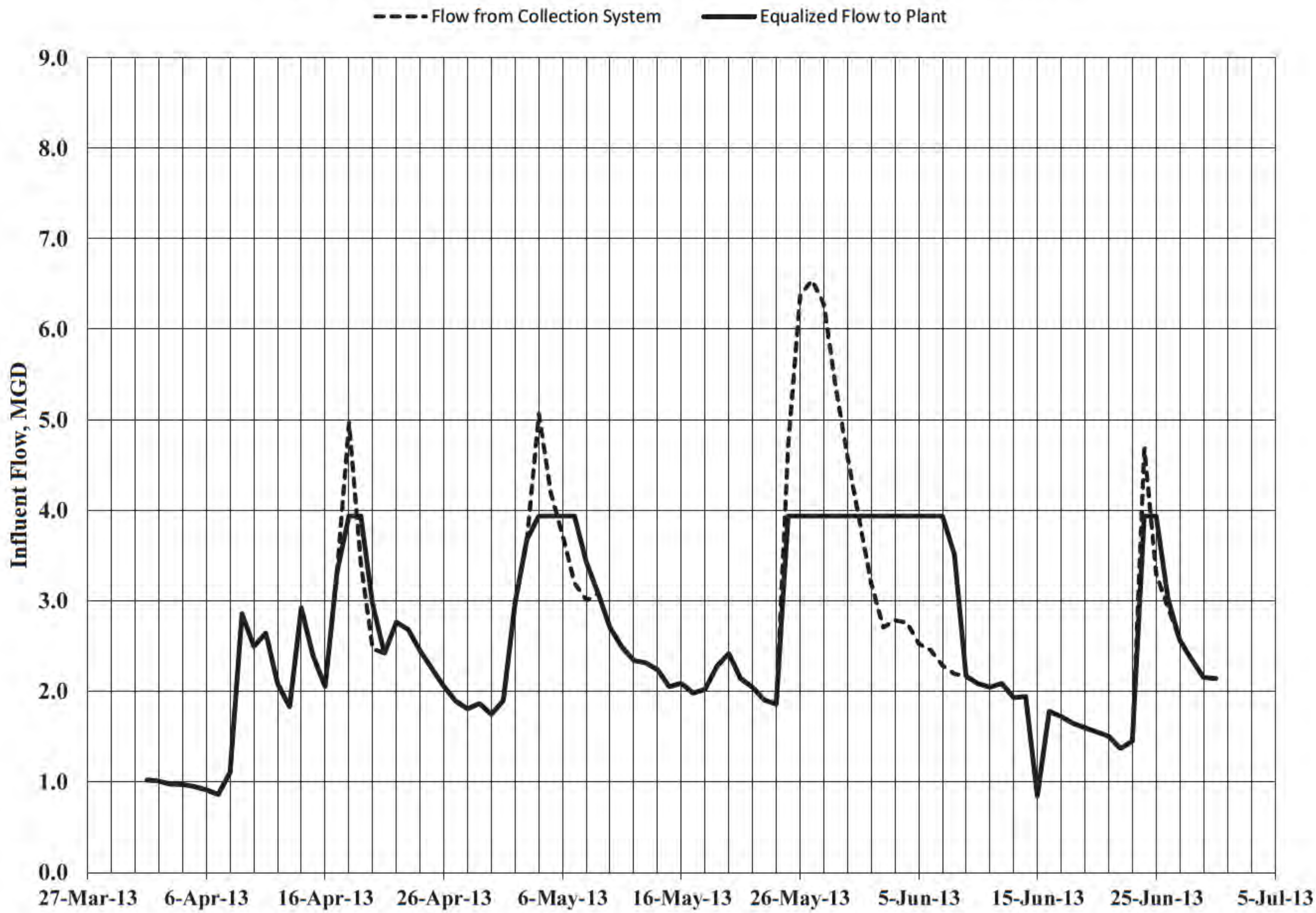


Table F.3 Equalization Basin Volume Evaluation - Sept. 2018 - Oct. 2018 Data

City of Webster City, Iowa
Storm Water Flow Equalization Basin Evaluation

Max. Month Flow (Sept. 2018) + 0.50 MGD	3.939	MGD Max. Flow to WWTP

Date	Influent Flow From Coll. System MGD	Flows To and From EQ Basin: Discharge To Basin MGD	Plant Cap. Avail for EQ Flow MGD	Discharge From Basin MGD	Basin Volume End of Day MG	Flow to Treatment Process MGD
1-Sep-18	2.96	0	0.98	0	0	2.96
2-Sep-18	3.23	0	0.71	0	0	3.23
3-Sep-18	2.879	0	1.06	0	0	2.88
4-Sep-18	5.106	1.167	0.00	0	1.167	3.94
5-Sep-18	4.661	0.722	0.00	0	1.889	3.94
6-Sep-18	4.976	1.037	0.00	0	2.926	3.94
7-Sep-18	4.932	0.993	0.00	0	3.919	3.94
8-Sep-18	3.89	0	0.05	0.049	3.87	3.94
9-Sep-18	3.203	0	0.74	0.736	3.134	3.94
10-Sep-18	3.07	0	0.87	0.869	2.265	3.94
11-Sep-18	2.799	0	1.14	1.14	1.125	3.94
12-Sep-18	2.617	0	1.32	1.125	0	3.74
13-Sep-18	2.337	0	1.60	0	0	2.34
14-Sep-18	2.186	0	1.75	0	0	2.19
15-Sep-18	2.02	0	1.92	0	0	2.02
16-Sep-18	1.948	0	1.99	0	0	1.95
17-Sep-18	1.901	0	2.04	0	0	1.90
18-Sep-18	1.942	0	2.00	0	0	1.94
19-Sep-18	3.676	0	0.26	0	0	3.68
20-Sep-18	5.23	1.291	0.00	0	1.291	3.94
21-Sep-18	5.962	2.023	0.00	0	3.314	3.94
22-Sep-18	5.109	1.17	0.00	0	4.484	3.94
23-Sep-18	5.171	1.232	0.00	0	5.716	3.94
24-Sep-18	4.064	0.125	0.00	0	5.841	3.94
25-Sep-18	3.639	0	0.30	0.3	5.541	3.94
26-Sep-18	3.606	0	0.33	0.333	5.208	3.94
27-Sep-18	2.856	0	1.08	1.083	4.125	3.94
28-Sep-18	2.425	0	1.51	1.514	2.611	3.94
29-Sep-18	2.639	0	1.30	1.3	1.311	3.94
30-Sep-18	2.132	0	1.81	1.311	0	3.44
1-Oct-18	4.749	0.81	0.00	0	0.81	3.94
2-Oct-18	3.927	0	0.01	0.012	0.798	3.94
3-Oct-18	3.397	0	0.54	0.542	0.256	3.94
4-Oct-18	3.054	0	0.89	0.256	0	3.31
5-Oct-18	3.043	0	0.90	0	0	3.04
6-Oct-18	2.685	0	1.25	0	0	2.69
7-Oct-18	2.817	0	1.12	0	0	2.82
8-Oct-18	6.397	2.458	0.00	0	2.458	3.94
9-Oct-18	7.887	3.948	0.00	0	6.406	3.94
10-Oct-18	6.706	2.767	0.00	0	9.173	3.94
11-Oct-18	5.318	1.379	0.00	0	10.552	3.94
12-Oct-18	4.501	0.562	0.00	0	11.114	3.94
13-Oct-18	3.948	0.009	0.00	0	**11.123**	3.94
14-Oct-18	3.471	0	0.47	0.468	10.655	3.94

Table F.3 Equalization Basin Volume Evaluation - Sept. 2018 - Oct. 2018 Data

City of Webster City, Iowa
Storm Water Flow Equalization Basin Evaluation

Max. Month Flow (Sept. 2018) + 0.50 MGD | **3.939** | **MGD Max. Flow to WWTP**

	Influent	Flows To and From EQ Basin			Basin Volume	Flow to
Date	Flow From Coll. System MGD	Discharge To Basin MGD	Plant Cap. Avail for EQ Flow MGD	Discharge From Basin MGD	End of Day MG	Treatment Process MGD
15-Oct-18	3.39	0	0.55	0.549	10.106	3.94
16-Oct-18	3.082	0	0.86	0.857	9.249	3.94
17-Oct-18	2.266	0	1.67	1.673	7.576	3.94
18-Oct-18	2.703	0	1.24	1.236	6.34	3.94
19-Oct-18	2.719	0	1.22	1.22	5.12	3.94
20-Oct-18	2.429	0	1.51	1.51	3.61	3.94
21-Oct-18	2.316	0	1.62	1.623	1.987	3.94
22-Oct-18	2.299	0	1.64	1.64	0.347	3.94
23-Oct-18	2.205	0	1.73	0.347	0	2.55
24-Oct-18	2.115	0	1.82	0	0	2.12
25-Oct-18	2.135	0	1.80	0	0	2.14
26-Oct-18	1.931	0	2.01	0	0	1.93
27-Oct-18	2.171	0	1.77	0	0	2.17
28-Oct-18	1.64	0	2.30	0	0	1.64
29-Oct-18	2.031	0	1.91	0	0	2.03
30-Oct-18	1.973	0	1.97	0	0	1.97
31-Oct-18	1.904	0	2.04	0	0	1.90

Figure F.4 September - October 2018 Equalization Basin Volume

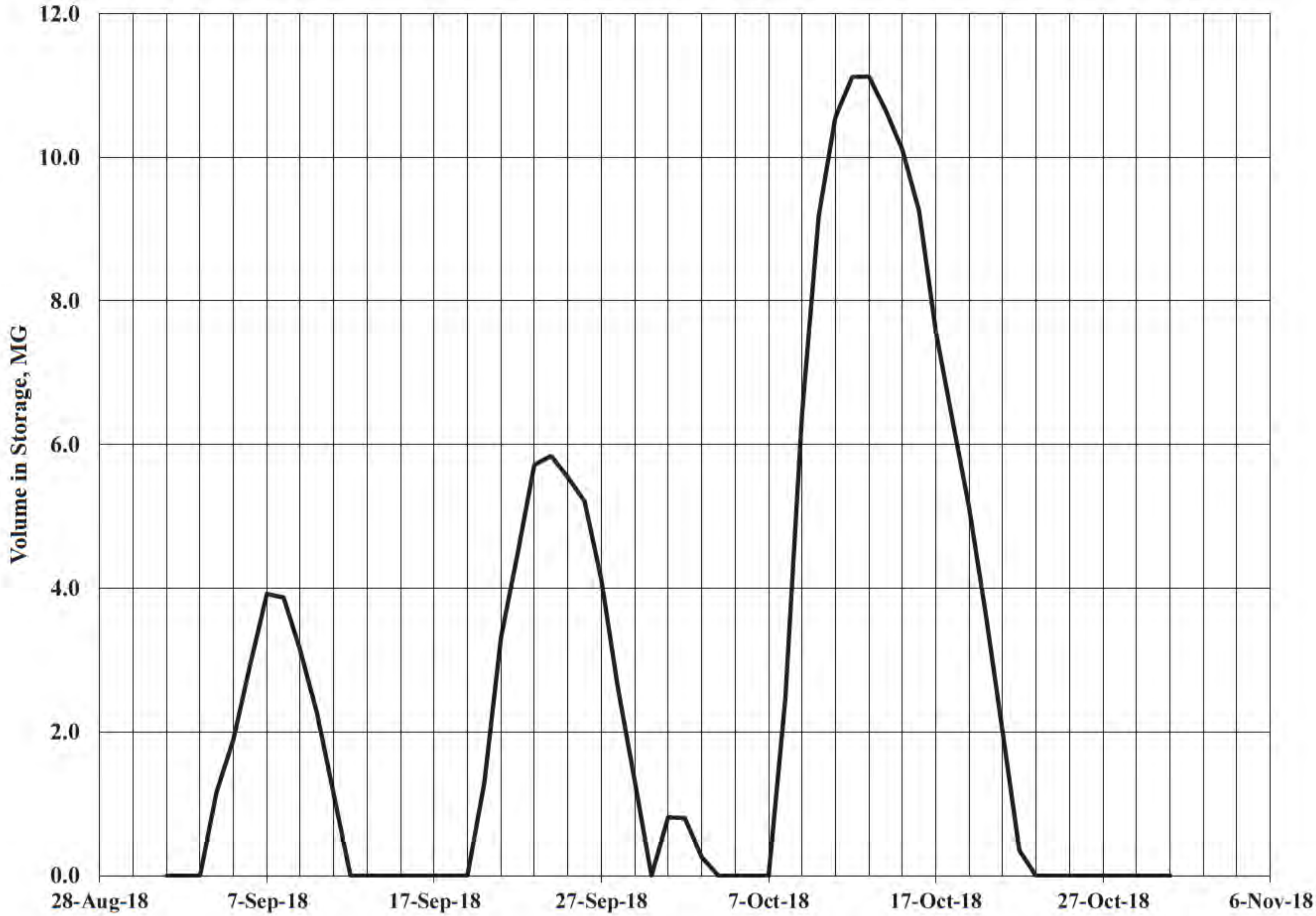


Figure F.5 September - October 2018 Influent Flow with Equaliztion Basin

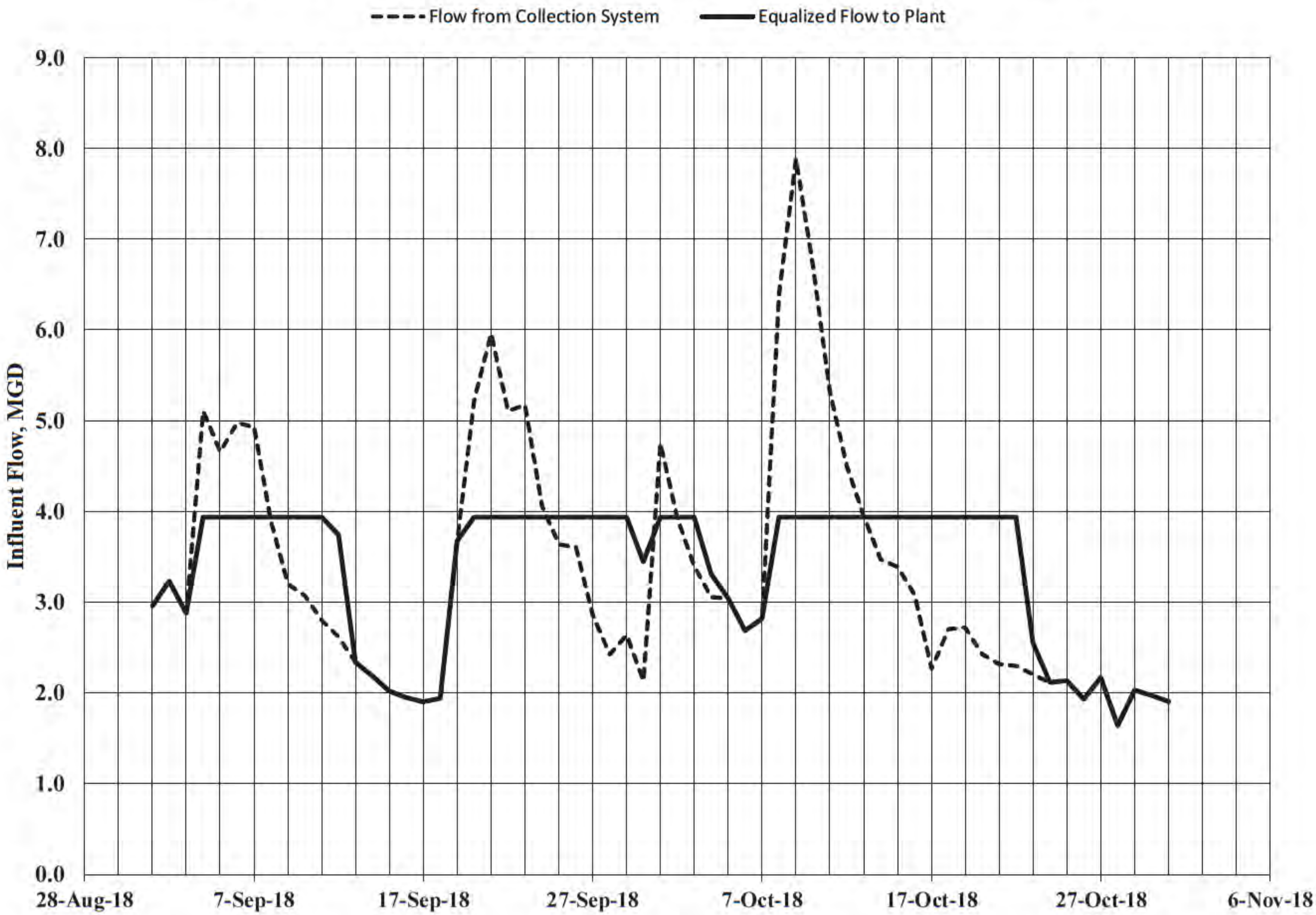


Table F.4 Equalization Basin Volume Evaluation - March 2019 - June 2019 Data

City of Webster City, Iowa
Storm Water Flow Equalization Basin Evaluation

Max. Month Flow (Sept. 2018) + 0.50 MGD | **3.939** | **MGD Max. Flow to WWTP**

Date	Influent Flow From Coll. System MGD	Flows To and From EQ Basin: Discharge To Basin MGD	Plant Cap. Avail for EQ Flow MGD	Discharge From Basin MGD	Basin Volume End of Day MG	Flow to Treatment Process MGD
1-Mar-19	1.087	0	2.85	0	0	1.09
2-Mar-19	1.061	0	2.88	0	0	1.06
3-Mar-19	1.002	0	2.94	0	0	1.00
4-Mar-19	1.077	0	2.86	0	0	1.08
5-Mar-19	1.078	0	2.86	0	0	1.08
6-Mar-19	1.093	0	2.85	0	0	1.09
7-Mar-19	1.093	0	2.85	0	0	1.09
8-Mar-19	1.398	0	2.54	0	0	1.40
9-Mar-19	1.144	0	2.80	0	0	1.14
10-Mar-19	1.405	0	2.53	0	0	1.41
11-Mar-19	1.413	0	2.53	0	0	1.41
12-Mar-19	2.472	0	1.47	0	0	2.47
13-Mar-19	7.262	3.323	0.00	0	3.323	3.94
14-Mar-19	4.773	0.834	0.00	0	4.157	3.94
15-Mar-19	3.059	0	0.88	0.88	3.277	3.94
16-Mar-19	3.381	0	0.56	0.558	2.719	3.94
17-Mar-19	2.423	0	1.52	1.516	1.203	3.94
18-Mar-19	2.649	0	1.29	1.203	0	3.85
19-Mar-19	2.577	0	1.36	0	0	2.58
20-Mar-19	2.533	0	1.41	0	0	2.53
21-Mar-19	2.476	0	1.46	0	0	2.48
22-Mar-19	2.407	0	1.53	0	0	2.41
23-Mar-19	2.286	0	1.65	0	0	2.29
24-Mar-19	2.098	0	1.84	0	0	2.10
25-Mar-19	2.129	0	1.81	0	0	2.13
26-Mar-19	2.093	0	1.85	0	0	2.09
27-Mar-19	2.055	0	1.88	0	0	2.06
28-Mar-19	1.958	0	1.98	0	0	1.96
29-Mar-19	1.903	0	2.04	0	0	1.90
30-Mar-19	1.823	0	2.12	0	0	1.82
31-Mar-19	1.792	0	2.15	0	0	1.79
1-Apr-19	1.785	0	2.15	0	0	1.79
2-Apr-19	1.78	0	2.16	0	0	1.78
3-Apr-19	1.953	0	1.99	0	0	1.95
4-Apr-19	2.26	0	1.68	0	0	2.26
5-Apr-19	2.176	0	1.76	0	0	2.18
6-Apr-19	2.129	0	1.81	0	0	2.13
7-Apr-19	2.091	0	1.85	0	0	2.09
8-Apr-19	2.044	0	1.90	0	0	2.04
9-Apr-19	2.172	0	1.77	0	0	2.17
10-Apr-19	3.019	0	0.92	0	0	3.02
11-Apr-19	3.143	0	0.80	0	0	3.14
12-Apr-19	3.029	0	0.91	0	0	3.03
13-Apr-19	2.584	0	1.36	0	0	2.58

Table F.4 Equalization Basin Volume Evaluation - March 2019 - June 2019 Data

City of Webster City, Iowa
Storm Water Flow Equalization Basin Evaluation

Max. Month Flow (Sept. 2018) + 0.50 MGD **3.939** **MGD Max. Flow to WWTP**

Date	Influent Flow From Coll. System MGD	Flows To and From EQ Basin Discharge To Basin MGD	Plant Cap. Avail for EQ Flow MGD	Discharge From Basin MGD	Basin Volume End of Day MG	Flow to Treatment Process MGD
14-Apr-19	2.372	0	1.57	0	0	2.37
15-Apr-19	2.393	0	1.55	0	0	2.39
16-Apr-19	2.298	0	1.64	0	0	2.30
17-Apr-19	2.262	0	1.68	0	0	2.26
18-Apr-19	2.162	0	1.78	0	0	2.16
19-Apr-19	2.298	0	1.64	0	0	2.30
20-Apr-19	1.831	0	2.11	0	0	1.83
21-Apr-19	1.799	0	2.14	0	0	1.80
22-Apr-19	2.121	0	1.82	0	0	2.12
23-Apr-19	2.018	0	1.92	0	0	2.02
24-Apr-19	1.943	0	2.00	0	0	1.94
25-Apr-19	1.911	0	2.03	0	0	1.91
26-Apr-19	1.796	0	2.14	0	0	1.80
27-Apr-19	2.111	0	1.83	0	0	2.11
28-Apr-19	2.015	0	1.92	0	0	2.02
29-Apr-19	1.915	0	2.02	0	0	1.92
30-Apr-19	1.947	0	1.99	0	0	1.95
1-May-19	1.882	0	2.06	0	0	1.88
2-May-19	1.843	0	2.10	0	0	1.84
3-May-19	1.783	0	2.16	0	0	1.78
4-May-19	1.721	0	2.22	0	0	1.72
5-May-19	1.694	0	2.25	0	0	1.69
6-May-19	3.612	0	0.33	0	0	3.61
7-May-19	2.671	0	1.27	0	0	2.67
8-May-19	3.547	0	0.39	0	0	3.55
9-May-19	3.244	0	0.70	0	0	3.24
10-May-19	3.094	0	0.85	0	0	3.09
11-May-19	3.059	0	0.88	0	0	3.06
12-May-19	2.569	0	1.37	0	0	2.57
13-May-19	2.46	0	1.48	0	0	2.46
14-May-19	2.688	0	1.25	0	0	2.69
15-May-19	2.446	0	1.49	0	0	2.45
16-May-19	2.437	0	1.50	0	0	2.44
17-May-19	2.727	0	1.21	0	0	2.73
18-May-19	3.336	0	0.60	0	0	3.34
19-May-19	3.901	0	0.04	0	0	3.90
20-May-19	3.578	0	0.36	0	0	3.58
21-May-19	3.952	0.013	0.00	0	0.013	3.94
22-May-19	3.849	0	0.09	0.013	0	3.86
23-May-19	4.436	0.497	0.00	0	0.497	3.94
24-May-19	7.519	3.58	0.00	0	4.077	3.94
25-May-19	5.319	1.38	0.00	0	5.457	3.94
26-May-19	4.363	0.424	0.00	0	5.881	3.94
27-May-19	4.117	0.178	0.00	0	**6.059**	3.94

Table F.4 Equalization Basin Volume Evaluation - March 2019 - June 2019 Data

City of Webster City, Iowa
Storm Water Flow Equalization Basin Evaluation

Max. Month Flow (Sept. 2018) + 0.50 MGD | **3.939** | **MGD Max. Flow to WWTP**

Date	Influent Flow From Coll. System MGD	Flows To and From EQ Basin: Discharge To Basin MGD	Plant Cap. Avail for EQ Flow MGD	Discharge From Basin MGD	Basin Volume End of Day MG	Flow to Treatment Process MGD
28-May-19	3.904	0	0.04	0.035	6.024	3.94
29-May-19	3.545	0	0.39	0.394	5.63	3.94
30-May-19	3.487	0	0.45	0.452	5.178	3.94
31-May-19	2.753	0	1.19	1.186	3.992	3.94
1-Jun-19	2.727	0	1.21	1.212	2.78	3.94
2-Jun-19	2.585	0	1.35	1.354	1.426	3.94
3-Jun-19	2.552	0	1.39	1.387	0.039	3.94
4-Jun-19	2.423	0	1.52	0.039	0	2.46
5-Jun-19	2.288	0	1.65	0	0	2.29
6-Jun-19	2.177	0	1.76	0	0	2.18
7-Jun-19	2.165	0	1.77	0	0	2.17
8-Jun-19	2.006	0	1.93	0	0	2.01
9-Jun-19	1.689	0	2.25	0	0	1.69
10-Jun-19	1.86	0	2.08	0	0	1.86
11-Jun-19	1.903	0	2.04	0	0	1.90
12-Jun-19	1.873	0	2.07	0	0	1.87
13-Jun-19	1.831	0	2.11	0	0	1.83
14-Jun-19	1.872	0	2.07	0	0	1.87
15-Jun-19	1.782	0	2.16	0	0	1.78
16-Jun-19	1.652	0	2.29	0	0	1.65
17-Jun-19	2.183	0	1.76	0	0	2.18
18-Jun-19	2.973	0	0.97	0	0	2.97
19-Jun-19	2.016	0	1.92	0	0	2.02
20-Jun-19	2.147	0	1.79	0	0	2.15
21-Jun-19	2.35	0	1.59	0	0	2.35
22-Jun-19	2.243	0	1.70	0	0	2.24
23-Jun-19	2.42	0	1.52	0	0	2.42
24-Jun-19	2.341	0	1.60	0	0	2.34
25-Jun-19	2.17	0	1.77	0	0	2.17
26-Jun-19	2.019	0	1.92	0	0	2.02
27-Jun-19	1.954	0	1.99	0	0	1.95
28-Jun-19	1.53	0	2.41	0	0	1.53
29-Jun-19	1.995	0	1.94	0	0	2.00
30-Jun-19	1.642	0	2.30	0	0	1.64

Figure F.6 March - June 2019 Equalization Basin Volume

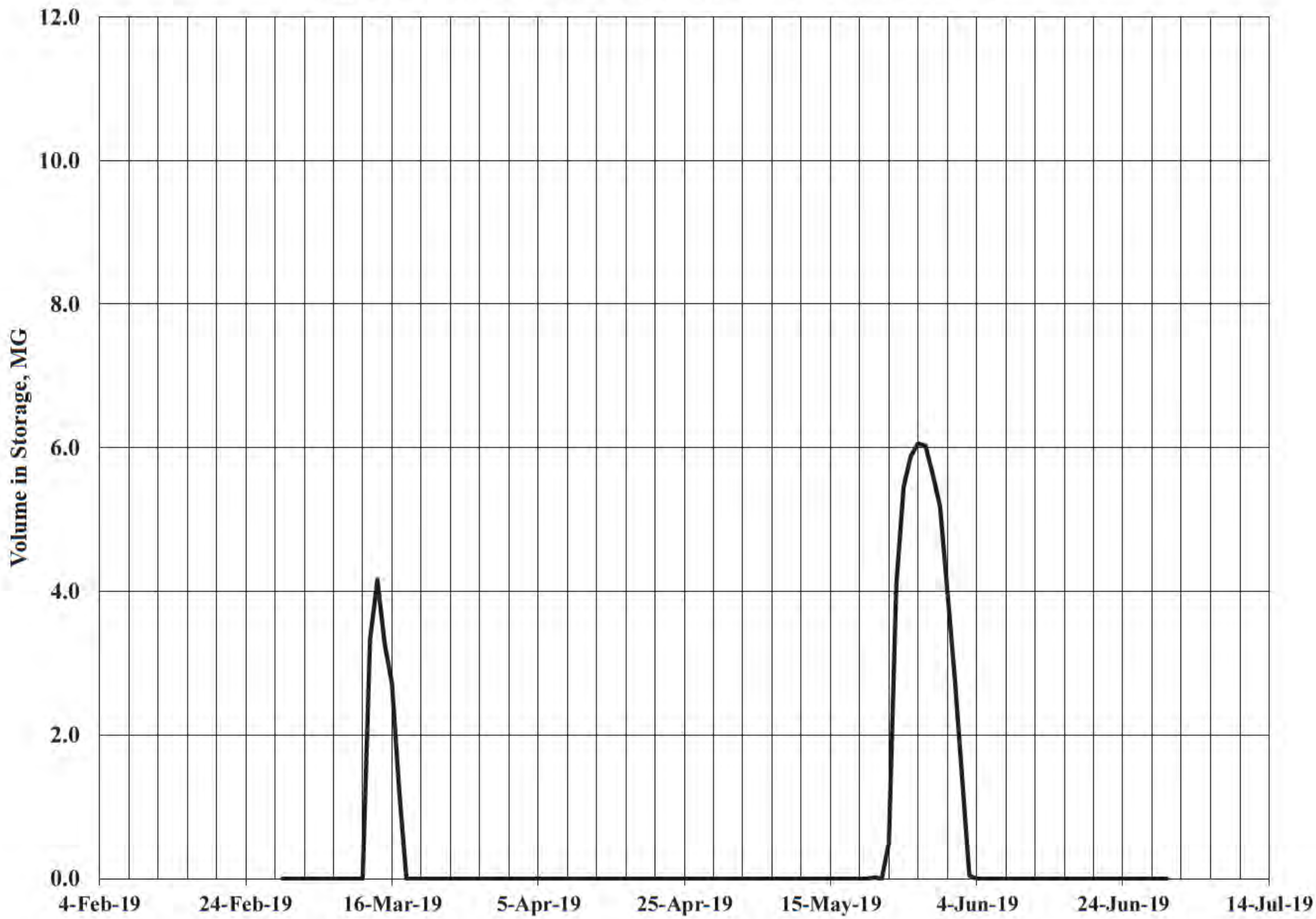
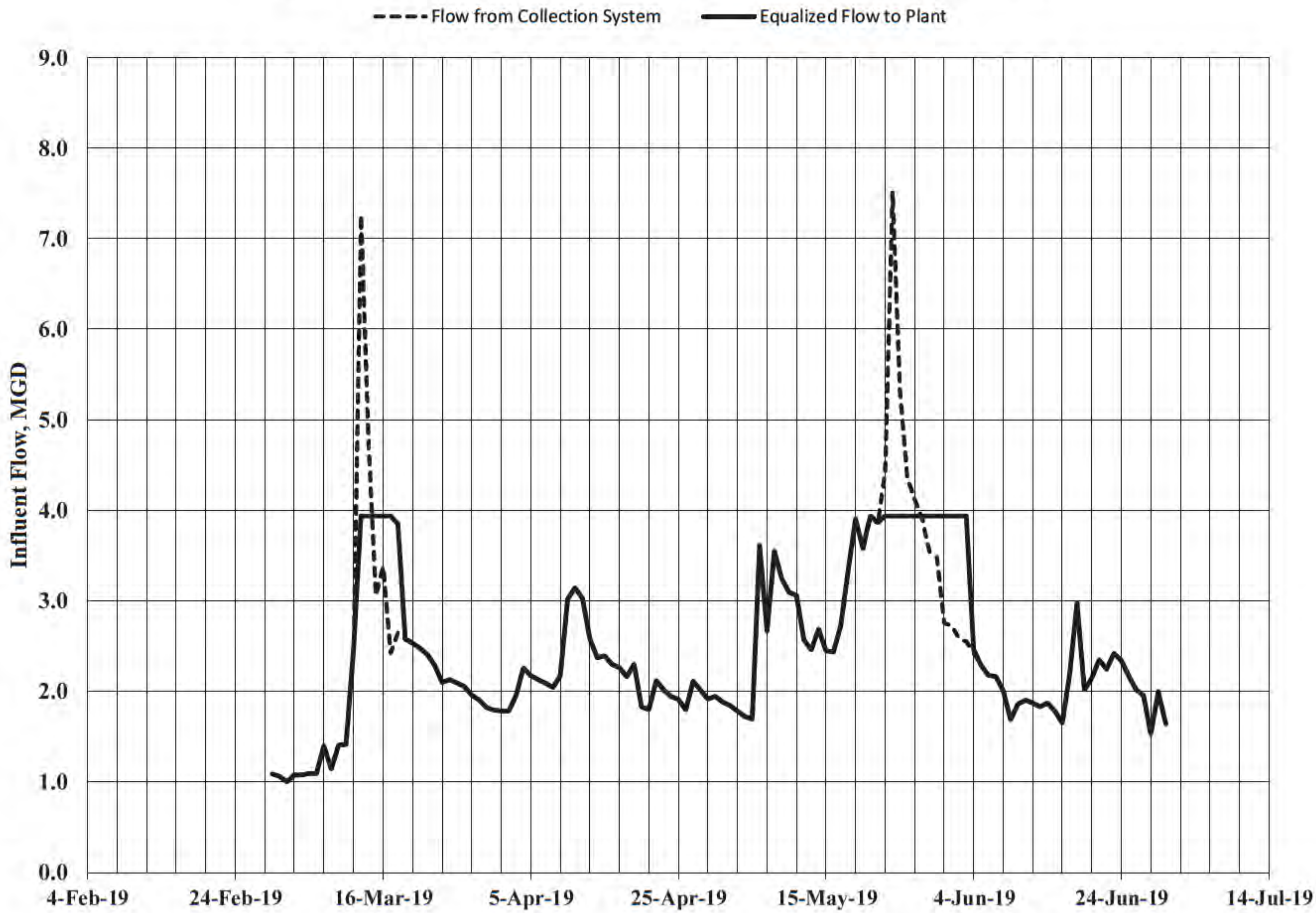


Figure F.7 March - June 2019 Influent Flow with Equaliztion Basin



Appendix G: Waste Load Allocation Calculations and Notes

Outfall 001	Discharge to Boone River Downstream of Ditch No. 166
Outfall 002	Discharge to Unnamed Creek to Oxbow Lake
Outfall 003	Discharge to Boone River Upstream of Ditch No. 166

City of Webster City

Proposed New Mechanical Facility
Proposed Outfall 001

This Package Contains

WASTELOAD ALLOCATION CALCULATIONS & NOTES

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS*

Facility Name: Webster City, City of STP | Sewage File Number: 6-40-63-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 001	**ADW = 1.989 MGD & AWW = 4.586 MGD**			
CBOD5	Secondary Treatment Levels Will Not Violate WQS			
Total D.O.	Minimum Concentration (mg/l)			
January - December	4.2			
Ammonia - Nitrogen				
January	11.1	15.9	257.7	593.2
February	12.7	15.0	296.9	556.3
March	6.6	15.4	154.7	573.7
April	4.9	16.3	114.6	611.1
May	5.6	15.8	130.9	592.4
June	4.2	15.1	98.7	563.6
July	3.2	18.3	75.6	686.0
August	3.1	16.9	71.8	633.2
September	3.4	17.1	79.5	642.4
October	5.0	16.3	117.4	611.4
November	7.5	15.3	175.4	571.8
December	8.0	16.6	186.7	621.1
Bacteria	Geometric Mean (#org./100 ml)		March 15th – November 15th	
E. coli	127			
Chloride	629	735	19,940	27,489
Sulfate	2,142	2,142	80,028	80,028
TRC**	0.013	0.022	0.403	0.827
Nitrate Nitrogen***	--	--	760	1,244
pH	6.5 - 14.0 Standard Units			

Major Facility Acute WET Testing Ratio: Use 95.9% of effluent and 4.1% of dilution water for the testing

Stream Network/Classification of Receiving Stream: Discharge pipe to the Boone River (A1, B(WW-1) HH)

Annual critical low flows in the Boone River at the outfall:
1Q10 flow 5.32 cfs, 7Q10 flow 5.76 cfs, 30Q10 flow 6.97 cfs, 30Q5 flow 13.6 cfs, harmonic mean flow 14.5 cfs

Performed by: Ian Willard

* All wasteload allocations/permit limits listed in this report apply at the beginning of the discharge pipe.
** Only required if chlorine is used for disinfection.
*** Nitrate nitrogen limits are based on a nitrate nitrogen TMDL for one stream segment of the Des Moines River. Limits are translated from the TMDL in a December 14, 2010 memo: "Deriving effluent limitations from the Des Moines River Nitrate TMDL." The translated Des Moines River TMDL nitrate nitrogen limits will govern the mass limits for nitrate as N and nitrate+nitrite as N.
**** The mass limits for nitrate as N and nitrate+nitrite as N will be governed by the translated Des Moines River TMDL nitrate nitrogen limits.

Antidegradation Review Requirement

A tier II antidegradation review is required. See Section 2 for details.

The antidegradation review conducted in this wasteload allocation is based on the current information available. Antidegradation could also be triggered during the NPDES permitting process based on new information.

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS*

Facility Name: Webster City, City of STP | Sewage File Number: 6-40-63-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 001	**ADW = 1.989 MGD & AWW = 4.586 MGD**			
Toxics				
1,1,1-Trichloroethane	2.754E+01	2.754E+01	1.029E+03	1.029E+03
1,1-Dichloroethylene	7.100E+00	5.633E+01	2.716E+02	2.104E+03
1,2-Dichloroethane	3.700E-01	6.155E+01	1.415E+01	2.299E+03
1,2-Dichloropropane	1.500E-01	1.500E-01	5.737E+00	5.737E+00
2,3,7,8-TCDD (Dioxin)	5.100E-11	5.100E-11	1.951E-09	1.951E-09
3,3-Dichlorobenzidine	2.800E-04	2.800E-04	1.071E-02	1.071E-02
4,4' DDT	1.468E-06	1.148E-03	4.601E-05	4.286E-02
Aldrin	5.000E-07	3.130E-03	1.912E-05	1.169E-01
Aluminum	1.307E+00	2.608E+00	4.095E+01	9.741E+01
Antimony	6.400E-01	1.148E+01	2.448E+01	4.286E+02
Arsenic (III)	5.000E-02	3.547E-01	1.912E+00	1.325E+01
Barium	2.139E+02	2.139E+02	7.988E+03	7.988E+03
Benzene	5.100E-01	1.721E+01	1.951E+01	6.429E+02
Benzo(a)Pyrene	1.800E-04	1.800E-04	6.885E-03	6.885E-03
Beryllium	5.216E-01	5.216E-01	1.948E+01	1.948E+01
Bis(2-ethylhexyl)phthalate	2.200E-02	2.200E-02	8.414E-01	8.414E-01
Bromoform	1.400E+00	1.400E+00	5.355E+01	5.355E+01
Cadmium	3.237E-03	1.059E-02	1.015E-01	3.952E-01
Carbon Tetrachloride	1.600E-02	2.248E+01	6.120E-01	8.397E+02
Chlordane	6.312E-06	2.504E-03	1.978E-04	9.351E-02
Chloride	6.29E+02	7.35E+02	1.9940E+04	2.7489E+04
Chlorobenzene	1.600E+00	1.680E+01	6.120E+01	6.273E+02
Chlorodibromomethane	1.300E-01	1.300E-01	4.972E+00	4.972E+00
Chloroform	4.700E+00	4.700E+00	1.798E+02	1.798E+02
Chloropyrifos	6.019E-05	8.659E-05	1.886E-03	3.234E-03
Chromium (VI)	1.679E-02	1.700E-02	5.261E-01	6.349E-01
Copper	4.111E-02	4.773E-02	1.289E+00	1.782E+00
Cyanide	7.634E-03	2.295E-02	2.393E-01	8.572E-01
Dichlorobromomethane	1.700E-01	1.700E-01	6.502E+00	6.502E+00
Dieldrin	5.400E-07	2.504E-04	2.065E-05	9.351E-03
Endosulfan	8.221E-05	2.295E-04	2.577E-03	8.572E-03
Endrin	5.285E-05	8.972E-05	1.656E-03	3.351E-03
Ethylbenzene	2.100E+00	2.363E+01	8.032E+01	8.825E+02
Fluoride	8.415E+00	8.415E+00	3.145E+02	3.145E+02
gamma-Hexachlorocyclohexane (Lindane)	9.911E-04	9.911E-04	3.702E-02	3.702E-02
Heptachlor	7.900E-07	5.425E-04	3.022E-05	2.026E-02

By Ian Willard
\\iowa.gov.state.ia.us\data\DNR_WQB_WQMA\Permitting\WLA\Facilities\Webster City 4063001\7-29-2022\Outfall 001\Webster City WLA writeup_001_7-29-2022.docx

ENVIRONMENTAL SERVICES DIVISION WATER QUALITY-BASED PERMIT LIMITS				
SECTION VI: WATER QUALITY-BASED PERMIT LIMITS* Facility Name: Webster City, City of STP — Sewage File Number: 6-40-63-0-01				
Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 001	**ADW = 1.989 MGD & AWW = 4.586 MGD**			
Toxics				
Heptachlor epoxide	3.900E-07	5.425E-04	1.492E-05	2.026E-02
Hexachlorobenzene	2.900E-06	2.900E-06	1.109E-04	1.109E-04
Hexachlorocyclopentadiene	1.100E+00	1.100E+00	4.207E+01	4.207E+01
Iron	1.043E+00	1.043E+00	3.896E+01	3.896E+01
Lead	2.404E-02	4.221E-01	7.533E-01	1.575E+01
Mercury (II)	1.500E-04	1.718E-03	5.737E-03	6.418E-02
Nickel	2.274E-01	1.417E+00	7.127E+00	5.291E+01
Nitrate as N****	3.338E+02	3.338E+02	1.247E+04	1.247E+04
Nitrate+Nitrite as N****	1.468E+02	3.338E+02	4.601E+03	1.247E+04
para-Dichlorobenzene	1.900E-01	2.086E+00	7.267E+00	7.793E+01
Parathion	1.908E-05	6.781E-05	5.981E-04	2.533E-03
Pentachlorophenol (PCP)	3.000E-02	3.040E-02	1.029E+00	1.135E+00
Phenols	7.340E-02	2.608E+00	2.301E+00	9.741E+01
Polychlorinated Biphenyls (PCBs)	6.400E-07	2.086E-03	2.448E-05	7.793E-02
Polynuclear Aromatic Hydrocarbons (PAHs)	4.404E-05	3.130E-02	1.380E-03	1.169E+00
Selenium	7.340E-03	2.013E-02	2.301E-01	7.520E-01
Silver	3.430E-02	3.430E-02	1.279E+00	1.279E+00
Sulfate	2.142E+03	2.142E+03	8.0028E+04	8.0028E+04
Tetrachloroethlyene	3.300E-02	3.300E-02	1.262E+00	1.262E+00
Thallium	4.700E-04	6.238E-01	1.798E-02	2.330E+01
Toluene	7.340E-02	2.608E+00	2.301E+00	9.741E+01
Total Residual Chlorine (TRC)**	1.3E-02	2.2E-02	4.03E-01	8.27E-01
Toxaphene	2.800E-06	7.616E-04	9.202E-05	2.844E-02
trans-1,2-Dichloroethylene	1.400E-01	1.400E-01	5.355E+00	5.355E+00
Trichloroethylene (TCE)	1.174E-01	4.173E+00	3.681E+00	1.559E+02
Vinyl Chloride	2.400E-02	2.400E-02	9.179E-01	9.179E-01
Zinc	3.626E-01	3.626E-01	1.353E+01	1.353E+01

WLAs/Permit Limits for the City of Webster City's Proposed Mechanical Plant at Proposed Outfall 001

These wasteload allocations and water quality-based permit limitations are for the City of Webster City's wastewater discharge from a proposed new mechanical facility at proposed Outfall 001. The wasteload allocations/permit limits are based on the Water Quality Standards (IAC 567.61) and the "Iowa Wasteload Allocation (WLA) Procedure," effective November 11, 2020. The chloride allocation/permit limits are based on the criteria that became effective on November 11, 2009.

The water quality-based limits in this WLA are calculated to meet the surface water quality criteria to protect downstream uses. There could be technology-based limits applicable to this facility that are more stringent than the water quality-based limits shown in this WLA. The technology-based limits could be derived from either federal guidelines based on different industrial categories or permit writer's judgment.

1. BACKGROUND:

The City of Webster City currently discharges treated domestic wastewater from a mechanical (trickling filter/rotating biological contactor) wastewater treatment facility into Unnamed Creek (at 42° 27' 27.57" N, 93° 48' 22.72" W) and the Boone River (at 42° 27' 30.89" N, 93° 48' 23.02" W). Only one outfall is used at a time.

The City of Webster City is proposing to build a new mechanical (activated sludge) wastewater treatment facility at a new location. The design flows and design mass loadings used throughout this WLA are proposed values for the proposed new mechanical facility. Several different possible outfall locations are under consideration. This WLA is for a case where the proposed new mechanical facility would discharge via a discharge pipe into the Boone River at 42° 26' 32" N, 93° 47' 47" W (proposed Outfall 001).

Based on information provided by the consultant, the discharge pipe would have a length of 1,440 ft from the facility to the outfall and a flow velocity of 3 fps for both ADW and AWW flow conditions. All WLAs/permit limits listed in this report apply at the beginning of the discharge pipe.

Route of flow and use designations:

At the outfall, the Boone River is an A1, B(WW-1) HH designated use waterbody. The designations have been adopted in Iowa's state rule described in the rule-referenced document of "Surface Water Classification," effective July 24, 2019. Based on the pollutants of concern, the use designations of waterbodies further downstream will not impact the resulting limits for this facility.

Critical low flow determination:

The annual critical low flows in the Boone River at the outfall are estimated based on the Weighted Drainage Area Ratio (WDAR) method from "Methods for estimating selected low-flow frequency statistics and harmonic mean flows for streams in Iowa" (2012, revised 2017) and flow statistics obtained at USGS gage station 05481000, located on the Boone River at Webster City, Iowa.

Table 1: Annual critical low flows

Location	D.A. (mi^2)	1Q10 (cfs)	7Q10 (cfs)	30Q10 (cfs)	30Q5 (cfs)	Harmonic Mean (cfs)
The Boone River at the outfall	844	5.32	5.76	6.97	13.6	14.5

Mixing Zone (MZ) and Zone of Initial Dilution (ZID):
The outfall is along the northwestern bank of the Boone River. Briggs Woods Park is directly across the Boone River from the outfall, along the southeastern bank of the Boone River. Therefore, no MZ is allowed in the Boone River at the outfall for toxics with criteria for human health protection.

2. ANTIDEGRADATION REVIEW:
According to the "Iowa Antidegradation Implementation Procedure," effective February 17, 2010 (IAC 567-61.2(2).e), all new or expanded regulated activities (with limited exceptions, such as unsewered communities) are subject to antidegradation review requirements.

Table 2: Antidegradation review analysis

Item #	Factor or scenario	Antidegradation determination	Analysis/comments
1	Design capacity increase	Yes ☒, No ☐, or Not Applicable ☐	1: Proposed new design capacity is indicated on the request form.
2	Significant Industrial Users (SIU) contributing new pollutant of concern (POC)	Yes ☐, No ☒, or Not Applicable ☐	1: As indicated on the request form.
3	New process contributing new pollutant of concern (POC)	Yes ☒, No ☐, or Not Applicable ☐	1: As indicated on the request form.
4	Less stringent water quality-based limits?	Yes ☒, No ☐, or Not Applicable ☐	1: Less stringent limits for some parameters will trigger an antidegradation review.
5	Outfall location change	Yes ☒, No ☐, or Not Applicable ☐	
Conclusion and discussion: Due to Items 1, 3, 4, and 5, a tier II antidegradation review is required. The antidegradation review conducted in this WLA is based on the current information available. Antidegradation could also be triggered during the NPDES permitting process based on new information.			

3. TOTAL MAXIMUM DAILY LOAD (TMDL) LIMITATIONS:
The following waterbodies in the discharge route are on the 2022 impaired waters list:

- The Boone River for bacteria (indicator bacteria – *E. coli*)
- The Des Moines River for bacteria (indicator bacteria – *E. coli*) and fish kill (due to unknown toxicity)
- Saylorville Reservoir for turbidity (Secchi disk transparency)
- Red Rock Reservoir for bacteria (indicator bacteria – *E. coli*) and turbidity

A nitrate nitrogen TMDL for one stream segment of the Des Moines River was approved by the EPA on September 25, 2009. In that TMDL, the City of Webster City STP was assigned nitrate nitrogen allocations, as discussed in the nitrate nitrogen section below. The City of Webster City STP has not been assigned allocations in any other TMDLs at this time.

The results presented in this report are wasteload allocations based on meeting the State's current water quality standards in the receiving waterbody. Additional and/or more stringent effluent limits may be applicable to this discharge based on approved TMDLs for impaired waterbodies, which may provide watershed based wasteload allocations. Information on impaired streams in Iowa and approved TMDLs can be found at the following website: http://www.iowadnr.gov/Environmental-Protection/Water-Quality/Watershed-Improvement/Impaired-Waters.

4. CALCULATIONS:
The WLAs/permit limits for this outfall are calculated based on the facility's proposed Average Dry Weather (ADW) design flow of 1.989 MGD and its proposed Average Wet Weather (AWW) design flow of 4.586 MGD.

Only wasteload allocations/permit limits (water quality-based effluent limits) calculated using DNR approved design flows can be applied in NPDES permits. Water quality-based effluent limits calculated using proposed flows that have not been approved by the DNR for permitting and compliance may be used for informational purposes only.

The water quality-based permit concentration limits are derived using the allowed stream flow and the proposed ADW design flow, while the loading limits are derived using the allowed stream flow and the proposed AWW design flow.

Toxics and TRC:
The toxics wasteload allocations will consider the procedures included in the 2000 revised WQS and the 2007 chemical criteria.

Effective November 11, 2020, water quality criteria for metals (excluding aluminum) are expressed as dissolved in IAC 567.61. Using EPA dissolved metal translators, water quality-based effluent limits in this WLA are expressed as total recoverable.

Effective November 11, 2020, water quality criteria for aluminum are expressed as bioavailable in IAC 567.61. Water quality-based effluent limits for aluminum in this WLA are expressed as total recoverable.

To protect the aquatic life use:
Important to toxics is the use of the 1Q10 stream flow in association with the acute wasteload allocation calculation. The chronic WLA will continue to use the 7Q10 stream flow in its calculations. In this case, 25% of the 7Q10 flow and 2.5% of the 1Q10 flow in the Boone River at the outfall are used as the MZ and the ZID, respectively.

TRC decay in the discharge pipe is taken into consideration. The decay is estimated by using a first order decay model with a length of 1,440 ft, a decay rate of 20/day, and a flow velocity of 3 fps.

To protect the human health (HH) use:
For pollutants that are non-carcinogenic and have criteria for human health protection, the criteria apply at the end of the MZ, which in this case is 0% of the 30Q5 flow in the Boone River at the outfall (due to Briggs Woods Park).

For pollutants that are carcinogenic and have criteria for human health protection, the criteria apply at the end of the MZ, which in this case is 0% of the harmonic mean flow in the Boone River at the outfall (due to Briggs Woods Park).

Final limits:
The maximum limits are those calculated for the protection of the aquatic life use and the average limits are the more stringent between those for the protection of the aquatic life use and those for the protection of the HH use.

The TRC limits are based on a sampling frequency of 5/week, based on a proposed design population equivalent (PE) of 44,587; the limits for the other toxics are based on a sampling frequency of 1/week. Please note that the translated Des Moines River TMDL nitrate nitrogen limits will govern the mass limits for nitrate as N and nitrate+nitrite as N.

Ammonia Nitrogen:
Standard stream background pH, temperatures, and concentrations of NH3-N are mixed with the discharge from the facility's effluent pH and temperature values to calculate the applicable instream criteria for the protection of the Boone River.

Based on the ratio of the stream flow to the discharge flow, 5% of the 1Q10 flow and 100% of the 30Q10 flow in the Boone River at the outfall are used as the ZID and the MZ, respectively. At the outfall, the Boone River is a B(WW-1) stream; therefore, early life protection will begin in March and run through September.

Ammonia nitrogen decay in the discharge pipe is taken into consideration. The decay is estimated by using a first order decay model with a length of 1,440 ft, a decay rate of 0.3/day at 20 °C, and a flow velocity of 3 fps.

The monthly background pH, temperatures, and NH3-N concentrations shown in Table 3 are used for the wasteload allocation/permit limits calculations based on the Year 2000 ammonia nitrogen criteria. Table 4 shows the statewide monthly effluent pH and temperature values for mechanical facilities. Table 5 shows the calculated ammonia nitrogen wasteload allocations for this facility.

Table 3: Background pH, temperatures, and NH3-N concentrations for use with Year 2000 ammonia nitrogen criteria

Months	pH	Temperature (°C)	NH_3-N (mg/l)
January	8.1	0.3	0.02
February	8.0	0.1	0.08
March	8.1	1.5	0.12
April	8.3	9.3	0.03
May	8.2	15.0	0.03
June	8.2	19.4	0.02
July	8.2	23.5	0.02
August	8.2	24.3	0.02
September	8.3	20.2	0.02
October	8.3	14.2	0.02
November	8.3	8.0	0.02
December	8.3	0.8	0.03

Table 4: Standard effluent pH and temperature values for mechanical facilities

Months	pH	Temperature (°C)
January	7.67	12.4
February	7.71	11.3
March	7.69	13.1
April	7.65	16.2
May	7.67	19.3
June	7.70	22.1
July	7.58	24.1
August	7.63	24.4
September	7.62	22.8
October	7.65	20.2
November	7.69	17.1
December	7.64	14.1

Table 5: Wasteload allocations for ammonia nitrogen for the protection of aquatic life

Months	ADW-based*		AWW-based**	
	Acute (mg/l)	Chronic (mg/l)	Acute (mg/l)	Chronic (mg/l)
January	15.9	11.1	15.5	6.7
February	15.0	12.7	14.5	7.8
March	15.4	6.6	15.0	4.0
April	16.3	4.9	16.0	3.0
May	15.8	5.6	15.5	3.4
June	15.1	4.2	14.7	2.6
July	18.3	3.2	17.9	2.0
August	16.9	3.1	16.6	1.9
September	17.1	3.4	16.8	2.1
October	16.3	5.0	16.0	3.1
November	15.3	7.5	15.0	4.6
December	16.6	8.0	16.2	4.9

*: bases for concentration limits; **: bases for mass loading limits

CBOD5/Total Dissolved Oxygen:
Streeter-Phelps DO Sag Model is used to simulate the decay of CBOD and dispersion of total Dissolved Oxygen (DO) in the receiving water downstream from the outfall. The criterion is that the discharge cannot cause the DO level in the receiving stream (warm water) to be below 5.0 mg/l.

The parameter values used in the modeling are listed below:

<u>Background</u>:
The temperature and ammonia nitrogen levels are shown in Table 3. The ultimate CBOD and DO levels are assumed to be 6.0 mg/l and 6.0 mg/l, respectively.

Effluent:
The temperatures are shown in Table 4. The CBOD5 level used in the modeling is 40 mg/l, which is the technology-based maximum limit for standard secondary treatment. The ammonia nitrogen values used in the modeling are the calculated acute wasteload allocations shown in Table 5. Both the proposed ADW and the proposed AWW flows and the ammonia nitrogen limits associated with them are used in the modeling.

Receiving stream parameters:
There is an average water channel slope of 0.00083 (the water channel elevation changes from 1,000 ft to 976 ft over a distance of approximately 29,020 ft, estimated based on GIS LiDAR 2-ft contour coverage).

USGS gage station 05481000 had field measurement data, such as stream flow, cross sectional area, stream width, and velocity. The stream depth is not reported; however, it can be derived using the following equation:

Depth = Cross Sectional Area / Width

Regression equations of Ln(Depth) vs. Ln(Flow) and Ln(Velocity) vs. Ln(Flow) were established with acceptable R-squared values. The stream width was also calculated.

Ln(Depth) = 0.4013 * Ln(Flow) – 1.7430 R-squared = 0.7762
Ln(Velocity) = 0.3992 * Ln(Flow) – 1.9357 R-squared = 0.8327
Width = Flow / (Depth * Velocity)

The gage station is located approximately 1 mile downstream of the outfall. Therefore, it is assumed that the above equations are valid in the Boone River at the outfall.

The stream width, depth, and velocity at 7Q10 + ADW and 7Q10 + AWW conditions were estimated using the above equations.

Table 6: Stream width, depth, and velocity

Flow Condition	Flow (cfs)	Width (ft)	Depth (ft)	Velocity (fps)
7Q10 + ADW	8.84	61.2	0.42	0.34
7Q10 + AWW	12.85	65.9	0.49	0.40

Reaeration:
Near and downstream of the outfall, the Boone River is a medium sized gentle sloped river with relatively uniform channel properties. Therefore, the USGS channel-control model (Melching and Flores, 1999) is used.

Discussion and conclusion:
The modeling results show that the effluent, which could have an allowed maximum effluent CBOD5 level of 40 mg/l (technology-based limits for secondary treatment), ammonia nitrogen levels as shown in Table 5, and a minimum DO level of 4.2 mg/l, will not cause the DO level in the receiving stream to be below 5.0 mg/l at any time.

***E. coli*:**

This facility discharges into a Class A1 waterbody. The water quality standard for *E. coli* in a Class A1 waterbody is a geometric mean of 126 org./100 ml and a sample maximum of 235 org./100 ml from March 15th through November 15th. The criteria apply at "end-of-pipe."

E. coli decay in the discharge pipe is taken into consideration. The decay is estimated by using a first order decay model with a length of 1,440 ft, a decay rate of 1/day, and a flow velocity of 3 fps. When *E. coli* decay in the discharge pipe is taken into consideration, the limits for the protection of the Class A1 waterbody are a geometric mean of 127 org./100 ml and a sample maximum of 236 org./100 ml from March 15th through November 15th.

However, 567 IAC 62.8(2) states that "the daily sample maximum criteria for *E. coli* set forth in 567 – Chapter 61 shall not be used as an end-of-pipe permit limitation." Therefore, only the geometric mean limit of 127 org./100 ml applies.

Chloride and Sulfate:

The chloride and sulfate criteria became effective on November 11, 2009 and apply to all Class B waters. The City of Webster City STP submitted data from a site-specific hardness study where they collected 31 background hardness samples in the Boone River upstream of the outfall over the course of approximately 2.5 years. They also collected 31 hardness samples in the effluent over the course of approximately 2.5 years. The median background hardness value was 362 mg/l and the median effluent hardness value was 351 mg/l.

Chloride criteria are functions of hardness and sulfate concentration, shown as follows:

$$\text{Acute criteria} = 287.8*(\text{Hardness})^{0.205797} *(\text{Sulfate})^{-0.07452}$$
$$\text{Chronic criteria} = 177.87*(\text{Hardness})^{0.205797} *(\text{Sulfate})^{-0.07452}$$

Sulfate criteria, shown in Table 7, are functions of hardness and chloride concentration and serve as both the acute and chronic criteria.

Table 7: Sulfate criteria

Hardness (mg/l as CaCO3)	Sulfate criteria (mg/l)		
	Chloride < 5 mg/l	5 mg/l <= Chloride < 25 mg/l	25 mg/l <= Chloride < 500 mg/l
< 100	500	500	500
100<=H<=500	500	(-57.478+5.79*H+54.163*Cl)*0.65	(1276.7+5.508*H-1.457*Cl)*0.65
H> 500	500	2,000	2,000

The acute criteria apply at the end of the ZID, and the chronic criteria apply at the end of the MZ. In this case, 25% of the 7Q10 flow and 2.5% of the 1Q10 flow in the Boone River at the outfall are used as the MZ and the ZID, respectively.

The default chloride concentration for both background water and effluent is 34 mg/l, while the default sulfate concentration for both background water and effluent is 63 mg/l. The limits are calculated based on an assumed sampling frequency of 1/week.

Iron:
Iron criteria are defined in the issue paper "Iron Criteria and Implementation for Iowa's Surface Waters" (November 11, 2020). A dissolved iron criterion of 1 mg/l applies at the end of the ZID for both general use and designated use streams. In this case, the ZID is 2.5% of the 1Q10 flow in the Boone River at the outfall. Water quality-based effluent limits for iron in this WLA are expressed as total recoverable.

pH:
Iowa Water Quality Standards (IAC 567.61.3.(3).a.(2) and IAC 567.61.3.(3).b.(2)) require that pH in Class A or Class B waters "shall not be less than 6.5 nor greater than 9.0." The criteria apply at the end of the MZ, which is 25% of the 7Q10 flow in the Boone River at the outfall.

Nitrate Nitrogen:
A nitrate nitrogen TMDL for one stream segment of the Des Moines River was approved by the EPA on September 25, 2009. In that TMDL, the City of Webster City STP was assigned nitrate nitrogen wasteload allocations of an average daily load of 400 lbs/day and a maximum daily load of 1,244 lbs/day. These WLAs were translated to nitrate nitrogen limits of a maximum daily limit of 1,244 lbs/day and a monthly average limit of 760 lbs/day in the December 14, 2010 memo: "Deriving effluent limitations from the Des Moines River Nitrate TMDL." Please note that the translated Des Moines River TMDL nitrate nitrogen limits will govern the mass limits for nitrate as N and nitrate+nitrite as N.

TDS:
Effective November 11, 2009, the site-specific TDS approach is no longer applicable; instead, the new chloride and sulfate criteria became applicable. However, the TDS level should be controlled to a level such that the narrative criteria stated in IAC 567.61.3 are fulfilled.

Major Facility Acute WET Testing Ratio:
The acute whole effluent toxicity (WET) testing ratio is calculated using the ADW design flow and 2.5% of the 1Q10 flow in the Boone River at the outfall as the ZID.

5. PERMIT LIMITATIONS:
- *Based on the Year 2006 Water Quality Standards and 2002 Permit Derivation Procedure.*

The acute and chronic WLAs are used as the values for input into the current permit derivation procedure. Under the 2002 permit derivation procedure, only for toxic parameters is the monitoring frequency considered in the calculation of final limits. The water quality-based limits are shown on Pages 1 – 3 of this report.

City of Webster City

Proposed New Mechanical Facility
Proposed Outfall 002

This Package Contains

WASTELOAD ALLOCATION CALCULATIONS & NOTES

ENVIRONMENTAL SERVICES DIVISION: WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS

Facility Name: Webster City, City of STP | Sewage File Number: 6-40-63-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 002	**ADW = 1.989 MGD & AWW = 4.586 MGD**			
CBOD5	Secondary Treatment Levels Will Not Violate WQS			
Total D.O. (Jan. – Dec.)	Minimum Concentration: 5.0 mg/l			
Ammonia - Nitrogen				
January	3.4	15.2	130.2	580.9
February	4.0	14.2	151.1	543.0
March	2.1	14.7	80.2	561.7
April	1.5	15.7	58.3	600.5
May	1.7	15.2	66.5	580.9
June	1.3	14.4	50.1	552.3
July	1.0	17.6	38.4	672.5
August	1.0	16.2	36.5	620.6
September	1.1	16.5	40.4	630.8
October	1.6	15.7	59.5	600.5
November	2.3	14.7	88.7	561.7
December	2.5	16.0	94.6	610.5
Bacteria	Geometric Mean (#org./100 ml)		March 15th – November 15th	
E. coli	126			
Chloride	437	706	16,728	27,004
Sulfate	2,000	2,054	76,494	78,572
TRC*	0.008	0.019	0.300	0.727
Nitrate Nitrogen**	--	--	760	1,244
pH	6.5 - 9.0 Standard Units			

Major Facility Acute WET Testing Ratio: Use 100% of effluent and 0% of dilution water for the testing

Stream Network/Classification of Receiving Stream: Unnamed Creek (A2, B(WW-2)) to Oxbow Lake (presumed A1, B(WW-1)) to Unnamed Creek 2 (presumed A1, B(WW-1)) to the Boone River (A1, B(WW-1) HH)

Annual critical low flows in Unnamed Creek at the outfall:
1Q10 flow 0 cfs, 7Q10 flow 0 cfs, 30Q10 flow 0 cfs

Annual critical low flows in Oxbow Lake at the mouth of Unnamed Creek:
1Q10 flow 0 cfs, 7Q10 flow 0 cfs, 30Q10 flow 0 cfs

Annual critical low flows in the Boone River at (just upstream of) the mouth of Unnamed Creek 2:
1Q10 flow 5.04 cfs, 7Q10 flow 5.49 cfs, 30Q10 flow 6.61 cfs, 30Q5 flow 12.9 cfs, harmonic mean flow 13.7 cfs

Performed by: Ian Willard

* Only required if chlorine is used for disinfection.
** Nitrate nitrogen limits are based on a nitrate nitrogen TMDL for one stream segment of the Des Moines River. Limits are translated from the TMDL in a December 14, 2010 memo: "Deriving effluent limitations from the Des Moines River Nitrate TMDL." The translated Des Moines River TMDL nitrate nitrogen limits will govern the mass limits for nitrate as N and nitrate+nitrite as N.
*** The mass limits for nitrate as N and nitrate+nitrite as N will be governed by the translated Des Moines River TMDL nitrate nitrogen limits.

<u>Antidegradation Review Requirement</u>

A tier II antidegradation review is required. See Section 2 for details. The antidegradation review conducted in this wasteload allocation is based on the current information available. Antidegradation could also be triggered during the NPDES permitting process based on new information.

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS

Facility Name: Webster City, City of STP — Sewage File Number: 6-40-63-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 002	**ADW = 1.989 MGD & AWW = 4.586 MGD**			
Toxics				
1,1,1-Trichloroethane	2.640E+01	2.640E+01	1.010E+03	1.010E+03
1,1-Dichloroethylene	1.500E+01	5.400E+01	4.027E+02	2.065E+03
1,2-Dichloroethane	7.818E-01	5.900E+01	2.098E+01	2.257E+03
1,2-Dichloropropane	3.170E-01	3.170E-01	8.507E+00	8.507E+00
2,3,7,8-TCDD (Dioxin)	1.078E-10	1.078E-10	2.892E-09	2.892E-09
3,3-Dichlorobenzidine	5.917E-04	5.917E-04	1.588E-02	1.588E-02
4,4' DDT	1.000E-06	1.100E-03	3.825E-05	4.207E-02
Aldrin	1.057E-06	3.000E-03	2.836E-05	1.147E-01
Aluminum	8.900E-01	2.500E+00	3.404E+01	9.562E+01
Antimony	1.311E+00	1.100E+01	3.561E+01	4.207E+02
Arsenic (III)	1.057E-01	3.400E-01	2.836E+00	1.300E+01
Barium	2.050E+02	2.050E+02	7.841E+03	7.841E+03
Benzene	1.078E+00	1.650E+01	2.892E+01	6.311E+02
Benzo(a)Pyrene	3.804E-04	3.804E-04	1.021E-02	1.021E-02
Beryllium	5.000E-01	5.000E-01	1.912E+01	1.912E+01
Bis(2-ethylhexyl)phthalate	4.649E-02	4.649E-02	1.248E+00	1.248E+00
Bromoform	2.958E+00	2.958E+00	7.940E+01	7.940E+01
Cadmium	2.171E-03	1.014E-02	8.303E-02	3.877E-01
Carbon Tetrachloride	3.381E-02	2.155E+01	9.074E-01	8.242E+02
Chlordane	4.300E-06	2.400E-03	1.645E-04	9.179E-02
Chloride	4.37E+02	7.06E+02	1.6728E+04	2.7004E+04
Chlorobenzene	3.277E+00	1.610E+01	8.901E+01	6.158E+02
Chlorodibromomethane	2.747E-01	2.747E-01	7.373E+00	7.373E+00
Chloroform	9.932E+00	9.932E+00	2.665E+02	2.665E+02
Chloropyrifos	4.100E-05	8.300E-05	1.568E-03	3.175E-03
Chromium (VI)	1.143E-02	1.629E-02	4.373E-01	6.232E-01
Copper	2.754E-02	4.570E-02	1.053E+00	1.748E+00
Cyanide	5.200E-03	2.200E-02	1.989E-01	8.414E-01
Dichlorobromomethane	3.592E-01	3.592E-01	9.641E+00	9.641E+00
Dieldrin	1.141E-06	2.400E-04	3.062E-05	9.179E-03
Endosulfan	5.600E-05	2.200E-04	2.142E-03	8.414E-03
Endrin	3.600E-05	8.600E-05	1.377E-03	3.289E-03
Ethylbenzene	4.301E+00	2.265E+01	1.168E+02	8.663E+02
Fluoride	8.077E+00	8.077E+00	3.089E+02	3.089E+02
gamma-Hexachlorocyclohexane (Lindane)	9.500E-04	9.500E-04	3.633E-02	3.633E-02
Heptachlor	1.669E-06	5.200E-04	4.480E-05	1.989E-02

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS

Facility Name: Webster City, City of STP — Sewage File Number: 6-40-63-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 002	**ADW = 1.989 MGD & AWW = 4.586 MGD**			
Toxics				
Heptachlor epoxide	8.241E-07	5.200E-04	2.212E-05	1.989E-02
Hexachlorobenzene	6.128E-06	6.128E-06	1.645E-04	1.645E-04
Hexachlorocyclopentadiene	2.253E+00	2.253E+00	6.120E+01	6.120E+01
Iron	1.000E+00	1.000E+00	3.825E+01	3.825E+01
Lead	1.597E-02	4.040E-01	6.109E-01	1.545E+01
Mercury (II)	3.072E-04	1.647E-03	8.345E-03	6.300E-02
Nickel	1.524E-01	1.357E+00	5.827E+00	5.191E+01
Nitrate as N***	3.200E+02	3.200E+02	1.224E+04	1.224E+04
Nitrate+Nitrite as N***	1.000E+02	3.200E+02	3.825E+03	1.224E+04
para-Dichlorobenzene	3.891E-01	2.000E+00	1.057E+01	7.649E+01
Parathion	1.300E-05	6.500E-05	4.972E-04	2.486E-03
Pentachlorophenol (PCP)	2.235E-02	2.914E-02	8.550E-01	1.114E+00
Phenols	5.000E-02	2.500E+00	1.912E+00	9.562E+01
Polychlorinated Biphenyls (PCBs)	1.352E-06	2.000E-03	3.630E-05	7.649E-02
Polynuclear Aromatic Hydrocarbons (PAHs)	3.000E-05	3.000E-02	1.147E-03	1.147E+00
Selenium	5.000E-03	1.930E-02	1.912E-01	7.382E-01
Silver	3.280E-02	3.280E-02	1.255E+00	1.255E+00
Sulfate	2.000E+03	2.054E+03	7.6494E+04	7.8572E+04
Tetrachloroethlyene	6.973E-02	6.973E-02	1.871E+00	1.871E+00
Thallium	9.626E-04	5.980E-01	2.615E-02	2.287E+01
Toluene	5.000E-02	2.500E+00	1.912E+00	9.562E+01
Total Residual Chlorine (TRC)*	8E-03	1.9E-02	3.00E-01	7.27E-01
Toxaphene	2.000E-06	7.300E-04	7.649E-05	2.792E-02
trans-1,2-Dichloroethylene	2.867E-01	2.867E-01	7.789E+00	7.789E+00
Trichloroethylene (TCE)	8.000E-02	4.000E+00	3.060E+00	1.530E+02
Vinyl Chloride	5.071E-02	5.071E-02	1.361E+00	1.361E+00
Zinc	3.472E-01	3.472E-01	1.328E+01	1.328E+01

WLAs/Permit Limits for the City of Webster City's Proposed Mechanical Plant at Proposed Outfall 002

These wasteload allocations and water quality-based permit limitations are for the City of Webster City's wastewater discharge from a proposed new mechanical facility at proposed Outfall 002. The wasteload allocations/permit limits are based on the Water Quality Standards (IAC 567.61) and the "Iowa Wasteload Allocation (WLA) Procedure," effective November 11, 2020. The chloride allocation/permit limits are based on the criteria that became effective on November 11, 2009.

The water quality-based limits in this WLA are calculated to meet the surface water quality criteria to protect downstream uses. There could be technology-based limits applicable to this facility that are more stringent than the water quality-based limits shown in this WLA. The technology-based limits could be derived from either federal guidelines based on different industrial categories or permit writer's judgment.

1. BACKGROUND:
The City of Webster City currently discharges treated domestic wastewater from a mechanical (trickling filter/rotating biological contactor) wastewater treatment facility into Unnamed Creek at 42° 27' 27.57" N, 93° 48' 22.72" W (existing Outfall 001) and the Boone River at 42° 27' 30.89" N, 93° 48' 23.02" W (existing Outfall 003). Only one outfall is used at a time.

The City of Webster City is proposing to build a new mechanical (activated sludge) wastewater treatment facility at a new location. The design flows and design mass loadings used throughout this WLA are proposed values for the proposed new mechanical facility. Several different possible outfall locations are under consideration. This WLA is for a case where the proposed new mechanical facility would discharge into Unnamed Creek at 42° 27' 27.57" N, 93° 48' 22.72" W (proposed Outfall 002, which is at the same location as existing Outfall 001).

Route of flow and use designations:
Directly downstream of the outfall, Unnamed Creek is an A2, B(WW-2) designated use waterbody. Approximately 270 ft downstream of the outfall, Unnamed Creek flows into Oxbow Lake. Oxbow Lake is a presumed A1, B(WW-1) designated use waterbody unless a future Field Use Attainability Assessment (UAA) proves otherwise. Oxbow Lake outlets into Unnamed Creek 2. Unnamed Creek 2 is a presumed A1, B(WW-1) designated use waterbody unless a future UAA proves otherwise. Unnamed Creek 2 flows into the Boone River. At the mouth of Unnamed Creek 2, the Boone River is an A1, B(WW-1) HH designated use waterbody.

The designations have been adopted in Iowa's state rule described in the rule-referenced document of "Surface Water Classification," effective July 24, 2019. Based on the pollutants of concern, the use designations of waterbodies further downstream will not impact the resulting limits for this facility.

Critical low flow determination:
The annual critical low flows in Unnamed Creek at the outfall and in Oxbow Lake at the mouth of Unnamed Creek are estimated based on the Regional Regression Equations (RRE) from "Methods for estimating selected low-flow frequency statistics and harmonic mean flows for streams in Iowa" (2012, revised 2017).

The annual critical low flows in the Boone River at (just upstream of) the mouth of Unnamed Creek 2 are estimated based on the Weighted Drainage Area Ratio (WDAR) method from "Methods for estimating selected low-flow frequency statistics and harmonic mean flows for streams in Iowa" (2012, revised 2017) and flow statistics obtained at USGS gage station 05481000, located on the Boone River near Webster City, Iowa.

Table 1: Annual critical low flows

Location	D.A. (mi^2)	1Q10 (cfs)	7Q10 (cfs)	30Q10 (cfs)	30Q5 (cfs)	Harmonic mean (cfs)
Unnamed Creek at the outfall	--	0	0	0	--	--
Oxbow Lake at the mouth of Unnamed Creek	--	0	0	0	--	--
The Boone River at (just upstream of) the mouth of Unnamed Creek 2	819	5.04	5.49	6.61	12.9	13.7

2. ANTIDEGRADATION REVIEW:
According to the "Iowa Antidegradation Implementation Procedure," effective February 17, 2010 (IAC 567-61.2(2).e), all new or expanded regulated activities (with limited exceptions, such as unsewered communities) are subject to antidegradation review requirements.

Table 2: Antidegradation review analysis

Item #	Factor or scenario	Antidegradation determination	Analysis/comments
1	Design capacity increase	Yes ☒, No ☐, or Not Applicable ☐	1: Proposed new design capacity is indicated on the request form.
2	Significant Industrial Users (SIU) contributing new pollutant of concern (POC)	Yes ☐, No ☒, or Not Applicable ☐	1: As indicated on the request form.
3	New process contributing new pollutant of concern (POC)	Yes ☒, No ☐, or Not Applicable ☐	1: As indicated on the request form.
4	Less stringent water quality-based limits?	Yes ☒, No ☐, or Not Applicable ☐	1: Less stringent limits for some parameters will trigger an antidegradation review.
5	Outfall location change	Yes ☐, No ☒, or Not Applicable ☐	

Conclusion and discussion:

Due to Items 1, 3, and 4, a tier II antidegradation review is required.

The antidegradation review conducted in this WLA is based on the current information available. Antidegradation could also be triggered during the NPDES permitting process based on new information.

3. TOTAL MAXIMUM DAILY LOAD (TMDL) LIMITATIONS:
The following waterbodies in the discharge route are on the 2022 impaired waters list:

- The Boone River for bacteria (indicator bacteria – *E. coli*)
- The Des Moines River for bacteria (indicator bacteria – *E. coli*) and fish kill (due to unknown toxicity)
- Saylorville Reservoir for turbidity (Secchi disk transparency)
- Red Rock Reservoir for bacteria (indicator bacteria – *E. coli*) and turbidity

A nitrate nitrogen TMDL for one stream segment of the Des Moines River was approved by the EPA on September 25, 2009. In that TMDL, the City of Webster City STP was assigned nitrate nitrogen allocations, as discussed in the nitrate nitrogen section below. The City of Webster City STP has not been assigned allocations in any other TMDLs at this time.

The results presented in this report are wasteload allocations based on meeting the State's current water quality standards in the receiving waterbody. Additional and/or more stringent effluent limits may be applicable to this discharge based on approved TMDLs for impaired waterbodies, which may provide watershed based wasteload allocations. Information on impaired streams in Iowa and approved TMDLs can be found at the following website: http://www.iowadnr.gov/Environmental-Protection/Water-Quality/Watershed-Improvement/Impaired-Waters.

4. CALCULATIONS:

The WLAs/permit limits for this outfall are calculated based on the facility's proposed Average Dry Weather (ADW) design flow of 1.989 MGD and its proposed Average Wet Weather (AWW) design flow of 4.586 MGD.

Only wasteload allocations/permit limits (water quality-based effluent limits) calculated using DNR approved design flows can be applied in NPDES permits. Water quality-based effluent limits calculated using proposed flows that have not been approved by the DNR for permitting and compliance may be used for informational purposes only.

The water quality-based permit concentration limits are derived using the allowed stream flow and the proposed ADW design flow, while the loading limits are derived using the allowed stream flow and the proposed AWW design flow.

Toxics and TRC:

The toxics wasteload allocations will consider the procedures included in the 2000 revised WQS and the 2007 chemical criteria.

Effective November 11, 2020, water quality criteria for metals (excluding aluminum) are expressed as dissolved in IAC 567.61. Using EPA dissolved metal translators, water quality-based effluent limits in this WLA are expressed as total recoverable.

Effective November 11, 2020, water quality criteria for aluminum are expressed as bioavailable in IAC 567.61. Water quality-based effluent limits for aluminum in this WLA are expressed as total recoverable.

To protect Unnamed Creek:

Important to toxics is the use of the 1Q10 stream flow in association with the acute wasteload allocation calculation. The chronic WLA will continue to use the 7Q10 stream flow in its calculations. Since the annual critical low flows in Unnamed Creek at the outfall are estimated to be all zero, the criteria apply at "end-of-pipe" instead of the end of the Mixing Zone (MZ) and the Zone of Initial Dilution (ZID).

To protect Oxbow Lake:

Important to toxics is the use of the 1Q10 stream flow in association with the acute wasteload allocation calculation. The chronic WLA will continue to use the 7Q10 stream flow in its calculations. Since the annual critical low flows in Oxbow Lake at the mouth of Unnamed Creek are estimated to be all zero, the criteria apply at that point.

To protect the downstream human health (HH) use:
For pollutants that are non-carcinogenic and have criteria for HH protection, the criteria apply at the end of the MZ, which in this case is 25% of the 30Q5 flow in the Boone River at (just upstream of) the mouth of Unnamed Creek 2.

For pollutants that are carcinogenic and have criteria for HH protection, the criteria apply at the end of the MZ, which in this case is 25% of the harmonic mean flow in the Boone River at (just upstream of) the mouth of Unnamed Creek 2.

Final limits:
The limits are the more stringent between those for the protection of Unnamed Creek, those for the protection of Oxbow Lake, and those for the protection of the downstream HH use.

The TRC limits are based on a sampling frequency of 5/week, based on a proposed design population equivalent (PE) of 44,587; the limits for the other toxics are based on a sampling frequency of 1/week. The translated Des Moines River TMDL nitrate nitrogen limits will govern the mass limits for nitrate as N and nitrate+nitrite as N.

Ammonia Nitrogen:
To protect Unnamed Creek:
Standard stream background pH, temperatures, and concentrations of NH3-N are mixed with the discharge from the facility's effluent pH and temperature values to calculate the applicable instream criteria for the protection of Unnamed Creek.

Since the annual critical low flows in Unnamed Creek at the outfall are all zero, the criteria apply at "end-of-pipe" instead of the end of the MZ and the ZID. At the outfall, Unnamed Creek is a B(WW-2) stream; therefore, early life protection will begin in April and run through September.

To protect Oxbow Lake:
Standard stream background pH, temperatures, and concentrations of NH3-N are mixed with the discharge from the facility's effluent pH and temperature values to calculate the applicable instream criteria for the protection of Oxbow Lake.

Since the annual critical low flows in Oxbow Lake at the mouth of Unnamed Creek are all zero, the criteria apply at that point. At the mouth of Unnamed Creek, Oxbow Lake is a presumed B(WW-1) waterbody; therefore, early life protection will begin in March and run through September.

Ammonia nitrogen decay in Unnamed Creek is considered in the calculations. The decay is estimated by using a first order decay model with a length of 270 ft and a decay rate of 0.3/day at 20°C. As described in the CBOD5/Total Dissolved Oxygen section below, a flow velocity of 0.85 fps is used for 7Q10 + ADW conditions and a flow velocity of 1.22 fps is used for 7Q10 + AWW conditions.

Final limits:
The monthly background pH, temperatures, and NH3-N concentrations shown in Table 3 are used for the wasteload allocation/permit limits calculations based on the Year 2000 ammonia nitrogen criteria. Table 4 shows the statewide monthly effluent pH and temperature values for mechanical facilities. The more stringent WLAs/limits between those for the protection of Unnamed Creek and those for the protection of Oxbow Lake are calculated and used and are shown in Table 5 .

Table 3: Background pH, temperatures, and NH3-N concentrations for use with Year 2000 ammonia nitrogen criteria

Months	pH	Temperature (°C)	NH_3-N (mg/l)
January	8.1	0.3	0.02
February	8.0	0.1	0.08
March	8.1	1.5	0.12
April	8.3	9.3	0.03
May	8.2	15.0	0.03
June	8.2	19.4	0.02
July	8.2	23.5	0.02
August	8.2	24.3	0.02
September	8.3	20.2	0.02
October	8.3	14.2	0.02
November	8.3	8.0	0.02
December	8.3	0.8	0.03

Table 4: Standard effluent pH and temperature values for mechanical facilities

Months	pH	Temperature (°C)
January	7.67	12.4
February	7.71	11.3
March	7.69	13.1
April	7.65	16.2
May	7.67	19.3
June	7.70	22.1
July	7.58	24.1
August	7.63	24.4
September	7.62	22.8
October	7.65	20.2
November	7.69	17.1
December	7.64	14.1

Table 5: Wasteload allocations for ammonia nitrogen for the protection of aquatic life

Months	ADW-based*		AWW-based**	
	Acute (mg/l)	Chronic (mg/l)	Acute (mg/l)	Chronic (mg/l)
January	15.2	3.4	15.2	3.4
February	14.2	4.0	14.2	4.0
March	14.7	2.1	14.7	2.1
April	15.7	1.5	15.7	1.5
May	15.2	1.7	15.2	1.7
June	14.4	1.3	14.4	1.3
July	17.6	1.0	17.6	1.0
August	16.2	1.0	16.2	1.0
September	16.5	1.1	16.5	1.1
October	15.7	1.6	15.7	1.6
November	14.7	2.3	14.7	2.3
December	16.0	2.5	16.0	2.5

*: bases for concentration limits; **: bases for mass loading limits

CBOD5/Total Dissolved Oxygen:
Streeter-Phelps DO Sag Model is used to simulate the decay of CBOD and dispersion of total Dissolved Oxygen (DO) in the receiving water downstream from the outfall. The criterion is that the discharge cannot cause the DO level in the receiving stream (warm water) to be below 5.0 mg/l.

The parameter values used in the modeling are listed below:

Background:
The temperature and ammonia nitrogen levels are shown in Table 3. The ultimate CBOD and DO levels are assumed to be 6.0 mg/l and 6.0 mg/l, respectively.

Effluent:
The temperatures are shown in Table 4. The CBOD5 level used in the modeling is 40 mg/l, which is the technology-based maximum limit for standard secondary treatment. The ammonia nitrogen values used in the modeling are the calculated acute wasteload allocations shown in Table 5. Both the proposed ADW and the proposed AWW flows and the ammonia nitrogen limits associated with them are used in the modeling.

Receiving stream parameters:
There is an average water channel slope of 0.01481 (the water channel elevation changes from 1,014 ft to 1,010 ft over a distance of approximately 270 ft, estimated based on the GIS LiDAR 2-ft contour coverage).

Field Use Attainability Assessment (UAA) had one site along Unnamed Creek. Two observations of stream width, depth, and velocity were made at the site. Based on these UAA data, the stream average width, depth, and velocity at 7Q10 + ADW and 7Q10 + AWW conditions are estimated and are shown in Table 6.

Table 6: Stream width, depth, and velocity

Flow Condition	Flow (cfs)	Width (ft)	Depth (ft)	Velocity (fps)
7Q10 + ADW	3.08	5.1	0.71	0.85
7Q10 + AWW	7.09	5.6	1.04	1.22

Reaeration:
At 7Q10 + ADW and 7Q10 + AWW flows conditions, the stream would have a relatively fast velocity. The stream also has a fairly steep slope. Therefore, the USGS pool-riffle model (Melching and Flores, 1999) is used.

Discussion and conclusion:
The modeling results show that the effluent, which could have an allowed maximum effluent CBOD5 level of 40 mg/l (technology-based limits for secondary treatment), ammonia nitrogen levels as shown in Table 5, and a minimum DO level of 5.0 mg/l, will not cause the DO level in the receiving stream to be below 5.0 mg/l at any time.

***E. coli*:**
To protect Unnamed Creek:
This facility discharges into a Class A2 waterbody. The water quality standard for *E. coli* in a Class A2 waterbody is a geometric mean of 630 org./100 ml and a sample maximum of 2,880 org./100 ml from March 15th through November 15th. The criteria apply at “end-of-pipe.”

To protect Oxbow Lake:
Oxbow Lake is a presumed Class A1 waterbody. The water quality standard for *E. coli* in a Class A1 waterbody is a geometric mean of 126 org./100 ml and a sample maximum of 235 org./100 ml from March 15th through November 15th. In this case, the criteria will apply in Oxbow Lake at the mouth of Unnamed Creek as well as at the outfall.

Final limit:
The limits for the protection of Oxbow Lake are more stringent. However, 567 IAC 62.8(2) states that “the daily sample maximum criteria for *E. coli* set forth in 567 – Chapter 61 shall not be used as an end-of-pipe permit limitation.” Therefore, only the geometric mean limit of 126 org./100 ml applies.

Chloride and Sulfate:
The chloride and sulfate criteria became effective on November 11, 2009 and apply to all Class B waters. The City of Webster City STP submitted data from a site-specific hardness study where they collected 31 background hardness samples in Unnamed Creek upstream of existing Outfall 001 over the course of approximately 2.5 years, 31 background hardness samples in the Boone River upstream of existing Outfall 003 over the course of approximately 2.5 years, and 31 hardness samples in the effluent over the course of approximately 2.5 years. The median Unnamed Creek background hardness value was 355 mg/l, the median Boone River background hardness value was 362 mg/l, and the median effluent hardness value was 351 mg/l.

The default chloride concentration for both background water and effluent is 34 mg/l, while the default sulfate concentration for both background water and effluent is 63 mg/l. The limits are calculated based on an assumed sampling frequency of 1/week.

Chloride criteria are functions of hardness and sulfate concentration, shown as follows:

$$\text{Acute criteria} = 287.8*(\text{Hardness})^{0.205797}*(\text{Sulfate})^{-0.07452}$$
$$\text{Chronic criteria} = 177.87*(\text{Hardness})^{0.205797}*(\text{Sulfate})^{-0.07452}$$

Sulfate criteria, shown in Table 7, are functions of hardness and chloride concentration and serve as both the acute and chronic criteria.

Table 7: Sulfate criteria

Hardness (mg/l as CaCO3)	Sulfate criteria (mg/l)		
	Chloride < 5 mg/l	5 mg/l <= Chloride < 25 mg/l	25 mg/l <= Chloride < 500 mg/l
< 100	500	500	500
100<=H<=500	500	(-57.478+5.79*H+54.163*Cl)*0.65	(1276.7+5.508*H-1.457*Cl)*0.65
H> 500	500	2,000	2,000

The acute criteria apply at the end of the ZID, and the chronic criteria apply at the end of the MZ. In this case, since the annual critical low flows in the receiving stream at the outfall are all zero, the criteria apply at “end-of-pipe” instead of the boundaries of the MZ and the ZID.

Iron:
Iron criteria are defined in the issue paper "Iron Criteria and Implementation for Iowa's Surface Waters" (November 11, 2020). A dissolved iron criterion of 1 mg/l applies at the end of the ZID for both general use and designated use streams. In this case, since the annual critical low flows in the receiving stream at the outfall are all zero, the criteria apply at "end-of-pipe." Water quality-based effluent limits for iron in this WLA are expressed as total recoverable.

pH:
Iowa Water Quality Standards (IAC 567.61.3.(3).a.(2) and IAC 567.61.3.(3).b.(2)) require that pH in Class A or Class B waters "shall not be less than 6.5 nor greater than 9.0." The criteria apply at the end of the MZ, which in this case is not available since the annual critical low flows in the receiving stream at the outfall are all zero. Thus, the criteria will apply at "end-of-pipe."

Nitrate Nitrogen:
A nitrate nitrogen TMDL for one stream segment of the Des Moines River was approved by the EPA on September 25, 2009. In that TMDL, the City of Webster City STP was assigned nitrate nitrogen wasteload allocations of an average daily load of 400 lbs/day and a maximum daily load of 1,244 lbs/day. These WLAs were translated to nitrate nitrogen limits of a maximum daily limit of 1,244 lbs/day and a monthly average limit of 760 lbs/day in the December 14, 2010 memo: "Deriving effluent limitations from the Des Moines River Nitrate TMDL." Please note that the translated Des Moines River TMDL nitrate nitrogen limits will govern the mass limits for nitrate as N and nitrate+nitrite as N.

TDS:
Effective November 11, 2009, the site-specific TDS approach is no longer applicable; instead, the new chloride and sulfate criteria became applicable. However, the TDS level should be controlled to a level such that the narrative criteria stated in IAC 567.61.3 are fulfilled.

Major Facility Acute WET Testing Ratio:
The acute whole effluent toxicity (WET) testing ratio is calculated using the ADW design flow and the ZID. In this case, since the annual critical low flows in the receiving stream at the outfall are all zero, 100% effluent is used.

5. PERMIT LIMITATIONS:
- *Based on the Year 2006 Water Quality Standards and 2002 Permit Derivation Procedure.*

The acute and chronic WLAs are used as the values for input into the current permit derivation procedure. Under the 2002 permit derivation procedure, only for toxic parameters is the monitoring frequency considered in the calculation of final limits. The water quality-based limits are shown on Pages 1 – 3 of this report.

City of Webster City

Proposed New Mechanical Facility
Proposed Outfall 003

This Package Contains

WASTELOAD ALLOCATION CALCULATIONS & NOTES

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS*

Facility Name: Webster City, City of STP — Sewage File Number: 6-40-63-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 003	**ADW = 1.989 MGD & AWW = 4.586 MGD**			
CBOD5	Secondary Treatment Levels Will Not Violate WQS			
Total D.O.	Minimum Concentration (mg/l)			
January - December	4.3			
Ammonia - Nitrogen				
January	5.0	15.4	157.6	584.0
February	5.8	14.4	182.4	546.2
March	3.1	14.8	96.2	564.7
April	2.2	15.8	70.4	603.4
May	2.6	15.3	80.3	584.1
June	1.9	14.6	60.5	555.6
July	1.5	17.8	46.5	676.6
August	1.4	16.4	44.1	624.4
September	1.6	16.7	48.8	634.3
October	2.3	15.9	72.0	603.7
November	3.4	14.8	107.3	564.5
December	3.7	16.1	114.4	613.3
Bacteria	Geometric Mean (#org./100 ml)		March 15th – November 15th	
E. coli	127			
Chloride	480	712	17,471	27,107
Sulfate	2,073	2,073	78,882	78,882
TRC**	0.0096	0.0214	0.350	0.815
Nitrate Nitrogen***	--	--	760	1,244
pH	6.5 - 14.0 Standard Units			

Major Facility Acute WET Testing Ratio: Use 99.1% of effluent and 0.9% of dilution water for the testing

Stream Network/Classification of Receiving Stream: Discharge pipe to the Boone River (A1, B(WW-1) HH)

Annual critical low flows in the Boone River at the outfall:
1Q10 flow 5.05 cfs, 7Q10 flow 5.50 cfs, 30Q10 flow 6.62 cfs, 30Q5 flow 13.0 cfs, harmonic mean flow 13.9 cfs

Performed by: Ian Willard

* All wasteload allocations/permit limits listed in this report apply at the beginning of the discharge pipe.
** Only required if chlorine is used for disinfection.
*** Nitrate nitrogen limits are based on a nitrate nitrogen TMDL for one stream segment of the Des Moines River. Limits are translated from the TMDL in a December 14, 2010 memo: "Deriving effluent limitations from the Des Moines River Nitrate TMDL." The translated Des Moines River TMDL nitrate nitrogen limits will govern the mass limits for nitrate as N and nitrate+nitrite as N.
**** The mass limits for nitrate as N and nitrate+nitrite as N will be governed by the translated Des Moines River TMDL nitrate nitrogen limits.

Antidegradation Review Requirement

A tier II antidegradation review is required. See Section 2 for details.

The antidegradation review conducted in this wasteload allocation is based on the current information available. Antidegradation could also be triggered during the NPDES permitting process based on new information.

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS*

Facility Name: Webster City, City of STP   Sewage File Number: 6-40-63-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 003	**ADW = 1.989 MGD & AWW = 4.586 MGD**			
Toxics				
1,1,1-Trichloroethane	2.664E+01	2.664E+01	1.014E+03	1.014E+03
1,1-Dichloroethylene	7.100E+00	5.450E+01	2.716E+02	2.074E+03
1,2-Dichloroethane	3.700E-01	5.954E+01	1.415E+01	2.266E+03
1,2-Dichloropropane	1.500E-01	1.500E-01	5.737E+00	5.737E+00
2,3,7,8-TCDD (Dioxin)	5.100E-11	5.100E-11	1.951E-09	1.951E-09
3,3-Dichlorobenzidine	2.800E-04	2.800E-04	1.071E-02	1.071E-02
4,4' DDT	1.101E-06	1.110E-03	3.992E-05	4.224E-02
Aldrin	5.000E-07	3.028E-03	1.912E-05	1.152E-01
Aluminum	9.795E-01	2.523E+00	3.552E+01	9.600E+01
Antimony	6.400E-01	1.110E+01	2.448E+01	4.224E+02
Arsenic (III)	5.000E-02	3.431E-01	1.912E+00	1.306E+01
Barium	2.069E+02	2.069E+02	7.872E+03	7.872E+03
Benzene	5.100E-01	1.665E+01	1.951E+01	6.336E+02
Benzo(a)Pyrene	1.800E-04	1.800E-04	6.885E-03	6.885E-03
Beryllium	5.046E-01	5.046E-01	1.920E+01	1.920E+01
Bis(2-ethylhexyl)phthalate	2.200E-02	2.200E-02	8.414E-01	8.414E-01
Bromoform	1.400E+00	1.400E+00	5.355E+01	5.355E+01
Cadmium	2.427E-03	1.023E-02	8.802E-02	3.893E-01
Carbon Tetrachloride	1.600E-02	2.175E+01	6.120E-01	8.275E+02
Chlordane	4.732E-06	2.422E-03	1.716E-04	9.216E-02
Chloride	4.80E+02	7.12E+02	1.7471E+04	2.7107E+04
Chlorobenzene	1.600E+00	1.625E+01	6.120E+01	6.182E+02
Chlorodibromomethane	1.300E-01	1.300E-01	4.972E+00	4.972E+00
Chloroform	4.700E+00	4.700E+00	1.798E+02	1.798E+02
Chloropyrifos	4.512E-05	8.377E-05	1.637E-03	3.187E-03
Chromium (VI)	1.258E-02	1.644E-02	4.564E-01	6.257E-01
Copper	3.082E-02	4.613E-02	1.118E+00	1.755E+00
Cyanide	5.723E-03	2.220E-02	2.076E-01	8.448E-01
Dichlorobromomethane	1.700E-01	1.700E-01	6.502E+00	6.502E+00
Dieldrin	5.400E-07	2.422E-04	2.065E-05	9.216E-03
Endosulfan	6.163E-05	2.220E-04	2.235E-03	8.448E-03
Endrin	3.962E-05	8.679E-05	1.437E-03	3.302E-03
Ethylbenzene	2.100E+00	2.286E+01	8.032E+01	8.698E+02
Fluoride	8.149E+00	8.149E+00	3.101E+02	3.101E+02
gamma-Hexachlorocyclohexane (Lindane)	9.588E-04	9.588E-04	3.648E-02	3.648E-02
Heptachlor	7.900E-07	5.248E-04	3.022E-05	1.997E-02

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS*

Facility Name: Webster City, City of STP   Sewage File Number: 6-40-63-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 003	**ADW = 1.989 MGD & AWW = 4.586 MGD**			
Toxics				
Heptachlor epoxide	3.900E-07	5.248E-04	1.492E-05	1.997E-02
Hexachlorobenzene	2.900E-06	2.900E-06	1.109E-04	1.109E-04
Hexachlorocyclopentadiene	1.100E+00	1.100E+00	4.207E+01	4.207E+01
Iron	1.009E+00	1.009E+00	3.840E+01	3.840E+01
Lead	1.802E-02	4.079E-01	6.535E-01	1.552E+01
Mercury (II)	1.500E-04	1.662E-03	5.737E-03	6.325E-02
Nickel	1.705E-01	1.370E+00	6.183E+00	5.212E+01
Nitrate as N****	3.230E+02	3.230E+02	1.229E+04	1.229E+04
Nitrate+Nitrite as N****	1.101E+02	3.230E+02	3.992E+03	1.229E+04
para-Dichlorobenzene	1.900E-01	2.018E+00	7.267E+00	7.680E+01
Parathion	1.431E-05	6.560E-05	5.189E-04	2.496E-03
Pentachlorophenol (PCP)	2.460E-02	2.941E-02	8.923E-01	1.119E+00
Phenols	5.503E-02	2.523E+00	1.996E+00	9.600E+01
Polychlorinated Biphenyls (PCBs)	6.400E-07	2.018E-03	2.448E-05	7.680E-02
Polynuclear Aromatic Hydrocarbons (PAHs)	3.302E-05	3.028E-02	1.197E-03	1.152E+00
Selenium	5.503E-03	1.948E-02	1.996E-01	7.411E-01
Silver	3.312E-02	3.312E-02	1.260E+00	1.260E+00
Sulfate	2.073E+03	2.073E+03	7.8882E+04	7.8882E+04
Tetrachloroethlyene	3.300E-02	3.300E-02	1.262E+00	1.262E+00
Thallium	4.700E-04	6.035E-01	1.798E-02	2.296E+01
Toluene	5.503E-02	2.523E+00	1.996E+00	9.600E+01
Total Residual Chlorine (TRC)**	9.6E-03	2.14E-02	3.50E-01	8.15E-01
Toxaphene	2.201E-06	7.367E-04	7.983E-05	2.803E-02
trans-1,2-Dichloroethylene	1.400E-01	1.400E-01	5.355E+00	5.355E+00
Trichloroethylene (TCE)	8.804E-02	4.037E+00	3.193E+00	1.536E+02
Vinyl Chloride	2.400E-02	2.400E-02	9.179E-01	9.179E-01
Zinc	3.505E-01	3.505E-01	1.333E+01	1.333E+01

WLAs/Permit Limits for the City of Webster City's Proposed Mechanical Plant at Proposed Outfall 003

These wasteload allocations and water quality-based permit limitations are for the City of Webster City's wastewater discharge from a proposed new mechanical facility at proposed Outfall 003. The wasteload allocations/permit limits are based on the Water Quality Standards (IAC 567.61) and the "Iowa Wasteload Allocation (WLA) Procedure," effective November 11, 2020. The chloride allocation/permit limits are based on the criteria that became effective on November 11, 2009.

The water quality-based limits in this WLA are calculated to meet the surface water quality criteria to protect downstream uses. There could be technology-based limits applicable to this facility that are more stringent than the water quality-based limits shown in this WLA. The technology-based limits could be derived from either federal guidelines based on different industrial categories or permit writer's judgment.

1. BACKGROUND:

The City of Webster City currently discharges treated domestic wastewater from a mechanical (trickling filter/rotating biological contactor) wastewater treatment facility into Unnamed Creek (at 42° 27' 27.57" N, 93° 48' 22.72" W) and the Boone River (at 42° 27' 30.89" N, 93° 48' 23.02" W). Only one outfall is used at a time.

The City of Webster City is proposing to build a new mechanical (activated sludge) wastewater treatment facility at a new location. The design flows and design mass loadings used throughout this WLA are proposed values for the proposed new mechanical facility. Several different possible outfall locations are under consideration. This WLA is for a case where the proposed new mechanical facility would discharge via a discharge pipe into the Boone River at 42° 26' 33" N, 93° 47' 41" W (proposed Outfall 003).

Based on information provided by the consultant, the discharge pipe would have a length of 1,440 ft from the facility to the outfall and a flow velocity of 3 fps for both ADW and AWW flow conditions. All WLAs/permit limits listed in this report apply at the beginning of the discharge pipe.

Route of flow and use designations:

At the outfall, the Boone River is an A1, B(WW-1) HH designated use waterbody. The designations have been adopted in Iowa's state rule described in the rule-referenced document of "Surface Water Classification," effective July 24, 2019. Based on the pollutants of concern, the use designations of waterbodies further downstream will not impact the resulting limits for this facility.

Critical low flow determination:

The annual critical low flows in the Boone River at the outfall are estimated based on the Weighted Drainage Area Ratio (WDAR) method from "Methods for estimating selected low-flow frequency statistics and harmonic mean flows for streams in Iowa" (2012, revised 2017) and flow statistics obtained at USGS gage station 05481000, located on the Boone River at Webster City, Iowa.

Table 1: Annual critical low flows

Location	D.A. (mi^2)	1Q10 (cfs)	7Q10 (cfs)	30Q10 (cfs)	30Q5 (cfs)	Harmonic Mean (cfs)
The Boone River at the outfall	820	5.05	5.50	6.62	13.0	13.9

Mixing Zone (MZ) and Zone of Initial Dilution (ZID):
The outfall is along the northwestern bank of the Boone River. Briggs Woods Park is directly across the Boone River from the outfall, along the southeastern bank of the Boone River. Therefore, no MZ is allowed in the Boone River at the outfall for toxics with criteria for human health (HH) protection.

Additionally, approximately 450 ft downstream of the outfall, Ditch Number 166 (which is a perennial stream at that point) flows into the Boone River (which is also a perennial stream at that point). The MZ and ZID for toxics and ammonia nitrogen need to be shortened from the default MZ and ZID. Those MZ and ZID values need to be shortened to 450/2,000 = 22.5% of their default values. The default MZ and ZID for ammonia nitrogen are based on the ratio of the stream flows to the discharge flow. Please note that the default MZ value is still used for the calculations of the pH limits. Table 2 shows the MZ and ZID for toxics, WET, ammonia nitrogen, and pH.

Table 2: MZ and ZID

Pollutant	Default		Shortened	
	ZID	MZ	ZID	MZ
Toxics with HH criteria protection	--	25%	--	0%
Toxics without HH criteria protection	2.5%	25%	0.5625%	5.625%
WET	2.5%	--	0.5625%	--
Ammonia Nitrogen	5%	100%	1.125%	22.5%
pH	--	25%	--	--

2. ANTIDEGRADATION REVIEW:
According to the "Iowa Antidegradation Implementation Procedure," effective February 17, 2010 (IAC 567-61.2(2).e), all new or expanded regulated activities (with limited exceptions, such as unsewered communities) are subject to antidegradation review requirements.

Table 3: Antidegradation review analysis

Item #	Factor or scenario	Antidegradation determination	Analysis/comments
1	Design capacity increase	Yes ☒, No ☐, or Not Applicable ☐	1: Proposed new design capacity is indicated on the request form.
2	Significant Industrial Users (SIU) contributing new pollutant of concern (POC)	Yes ☐, No ☒, or Not Applicable ☐	1: As indicated on the request form.
3	New process contributing new pollutant of concern (POC)	Yes ☒, No ☐, or Not Applicable ☐	1: As indicated on the request form.
4	Less stringent water quality-based limits?	Yes ☒, No ☐, or Not Applicable ☐	1: Less stringent limits for some parameters will trigger an antidegradation review.
5	Outfall location change	Yes ☒, No ☐, or Not Applicable ☐	
Conclusion and discussion: Due to Items 1, 3, 4, and 5, a tier II antidegradation review is required. The antidegradation review conducted in this WLA is based on the current information available. Antidegradation could also be triggered during the NPDES permitting process based on new information.			

3. TOTAL MAXIMUM DAILY LOAD (TMDL) LIMITATIONS:
The following waterbodies in the discharge route are on the 2022 impaired waters list:

- The Boone River for bacteria (indicator bacteria – *E. coli*)
- The Des Moines River for bacteria (indicator bacteria – *E. coli*) and fish kill (due to unknown toxicity)
- Saylorville Reservoir for turbidity (Secchi disk transparency)
- Red Rock Reservoir for bacteria (indicator bacteria – *E. coli*) and turbidity

A nitrate nitrogen TMDL for one stream segment of the Des Moines River was approved by the EPA on September 25, 2009. In that TMDL, the City of Webster City STP was assigned nitrate nitrogen allocations, as discussed in the nitrate nitrogen section below. The City of Webster City STP has not been assigned allocations in any other TMDLs at this time.

The results presented in this report are wasteload allocations based on meeting the State's current water quality standards in the receiving waterbody. Additional and/or more stringent effluent limits may be applicable to this discharge based on approved TMDLs for impaired waterbodies, which may provide watershed based wasteload allocations. Information on impaired streams in Iowa and approved TMDLs can be found at the following website: http://www.iowadnr.gov/Environmental-Protection/Water-Quality/Watershed-Improvement/Impaired-Waters.

4. CALCULATIONS:
The WLAs/permit limits for this outfall are calculated based on the facility's proposed Average Dry Weather (ADW) design flow of 1.989 MGD and its proposed Average Wet Weather (AWW) design flow of 4.586 MGD.

Only wasteload allocations/permit limits (water quality-based effluent limits) calculated using DNR approved design flows can be applied in NPDES permits. Water quality-based effluent limits calculated using proposed flows that have not been approved by the DNR for permitting and compliance may be used for informational purposes only.

The water quality-based permit concentration limits are derived using the allowed stream flow and the proposed ADW design flow, while the loading limits are derived using the allowed stream flow and the proposed AWW design flow.

Toxics and TRC:
The toxics wasteload allocations will consider the procedures included in the 2000 revised WQS and the 2007 chemical criteria.

Effective November 11, 2020, water quality criteria for metals (excluding aluminum) are expressed as dissolved in IAC 567.61. Using EPA dissolved metal translators, water quality-based effluent limits in this WLA are expressed as total recoverable.

Effective November 11, 2020, water quality criteria for aluminum are expressed as bioavailable in IAC 567.61. Water quality-based effluent limits for aluminum in this WLA are expressed as total recoverable.

To protect the aquatic life use:
Important to toxics is the use of the 1Q10 stream flow in association with the acute wasteload allocation calculation. The chronic WLA will continue to use the 7Q10 stream flow in its calculations. In this case, 5.625% of the 7Q10 flow and 0.5625% of the 1Q10 flow in the Boone River at the outfall are used as the MZ and the ZID, respectively.

TRC decay in the discharge pipe is taken into consideration. The decay is estimated by using a first order decay model with a length of 1,440 ft, a decay rate of 20/day, and a flow velocity of 3 fps.

To protect the human health (HH) use:
For pollutants that are non-carcinogenic and have criteria for human health protection, the criteria apply at the end of the MZ, which in this case is 0% of the 30Q5 flow in the Boone River at the outfall (due to Briggs Woods Park).

For pollutants that are carcinogenic and have criteria for human health protection, the criteria apply at the end of the MZ, which in this case is 0% of the harmonic mean flow in the Boone River at the outfall (due to Briggs Woods Park).

Final limits:
The maximum limits are those calculated for the protection of the aquatic life use and the average limits are the more stringent between those for the protection of the aquatic life use and those for the protection of the HH use.

The TRC limits are based on a sampling frequency of 5/week, based on a proposed design population equivalent (PE) of 44,587; the limits for the other toxics are based on a sampling frequency of 1/week. The translated Des Moines River TMDL nitrate nitrogen limits will govern the mass limits for nitrate as N and nitrate+nitrite as N.

Ammonia Nitrogen:
Standard stream background pH, temperatures, and concentrations of NH3-N are mixed with the discharge from the facility's effluent pH and temperature values to calculate the applicable instream criteria for the protection of the Boone River.

Based on the ratio of the stream flow to the discharge flow and the shortened MZ and ZID (discussed above), 1.125% of the 1Q10 flow and 22.5% of the 30Q10 flow in the Boone River at the outfall are used as the ZID and the MZ, respectively. At the outfall, the Boone River is a B(WW-1) stream; therefore, early life protection will begin in March and run through September.

Ammonia nitrogen decay in the discharge pipe is taken into consideration. The decay is estimated by using a first order decay model with a length of 1,440 ft, a decay rate of 0.3/day at 20 °C, and a flow velocity of 3 fps.

The monthly background pH, temperatures, and NH3-N concentrations shown in Table 4 are used for the wasteload allocation/permit limits calculations based on the Year 2000 ammonia nitrogen criteria. Table 5 shows the statewide monthly effluent pH and temperature values for mechanical facilities. Table 6 shows the calculated ammonia nitrogen wasteload allocations for this facility.

Table 4: Background pH, temperatures, and NH3-N concentrations for use with Year 2000 ammonia nitrogen criteria

Months	pH	Temperature (°C)	NH_3-N (mg/l)
January	8.1	0.3	0.02
February	8.0	0.1	0.08
March	8.1	1.5	0.12
April	8.3	9.3	0.03
May	8.2	15.0	0.03
June	8.2	19.4	0.02
July	8.2	23.5	0.02
August	8.2	24.3	0.02
September	8.3	20.2	0.02
October	8.3	14.2	0.02
November	8.3	8.0	0.02
December	8.3	0.8	0.03

Table 5: Standard effluent pH and temperature values for mechanical facilities

Months	pH	Temperature (°C)
January	7.67	12.4
February	7.71	11.3
March	7.69	13.1
April	7.65	16.2
May	7.67	19.3
June	7.70	22.1
July	7.58	24.1
August	7.63	24.4
September	7.62	22.8
October	7.65	20.2
November	7.69	17.1
December	7.64	14.1

Table 6: Wasteload allocations for ammonia nitrogen for the protection of aquatic life

Months	ADW-based*		AWW-based**	
	Acute (mg/l)	Chronic (mg/l)	Acute (mg/l)	Chronic (mg/l)
January	15.4	5.0	15.3	4.1
February	14.4	5.8	14.3	4.8
March	14.8	3.1	14.8	2.5
April	15.8	2.2	15.8	1.8
May	15.3	2.6	15.3	2.1
June	14.6	1.9	14.5	1.6
July	17.8	1.5	17.7	1.2
August	16.4	1.4	16.3	1.2
September	16.7	1.6	16.6	1.3
October	15.9	2.3	15.8	1.9
November	14.8	3.4	14.8	2.8
December	16.1	3.7	16.0	3.0

*: bases for concentration limits; **: bases for mass loading limits

CBOD5/Total Dissolved Oxygen:
Streeter-Phelps DO Sag Model is used to simulate the decay of CBOD and dispersion of total Dissolved Oxygen (DO) in the receiving water downstream from the outfall. The criterion is that the discharge cannot cause the DO level in the receiving stream (warm water) to be below 5.0 mg/l.

The parameter values used in the modeling are listed below:

Background:
The temperature and ammonia nitrogen levels are shown in Table 4. The ultimate CBOD and DO levels are assumed to be 6.0 mg/l and 6.0 mg/l, respectively.

Effluent:
The temperatures are shown in Table 5. The CBOD5 level used in the modeling is 40 mg/l, which is the technology-based maximum limit for standard secondary treatment. The ammonia nitrogen values used in the modeling are the calculated acute wasteload allocations shown in Table 6. Both the proposed ADW and the proposed AWW flows and the ammonia nitrogen limits associated with them are used in the modeling.

Receiving stream parameters:
There is an average water channel slope of 0.00083 (the water channel elevation changes from 1,000 ft to 976 ft over a distance of approximately 29,020 ft, estimated based on GIS LiDAR 2-ft contour coverage).

USGS gage station 05481000 had field measurement data, such as stream flow, cross sectional area, stream width, and velocity. The stream depth is not reported; however, it can be derived using the following equation:

Depth = Cross Sectional Area / Width

Regression equations of Ln(Depth) vs. Ln(Flow) and Ln(Velocity) vs. Ln(Flow) were established with acceptable R-squared values. The stream width was also calculated.

Ln(Depth) = 0.4013 * Ln(Flow) – 1.7430 R-squared = 0.7763
Ln(Velocity) = 0.3994 * Ln(Flow) – 1.9370 R-squared = 0.8327
Width = Flow / (Depth * Velocity)

The gage station is located approximately 1 mile downstream of the outfall. Therefore, it is assumed that the above equations are valid in the Boone River at the outfall.

The stream width, depth, and velocity at 7Q10 + ADW and 7Q10 + AWW conditions were estimated using the above equations.

Table 7: Stream width, depth, and velocity

Flow Condition	Flow (cfs)	Width (ft)	Depth (ft)	Velocity (fps)
7Q10 + ADW	8.58	60.8	0.41	0.34
7Q10 + AWW	12.59	65.7	0.48	0.40

Reaeration:
Near and downstream of the outfall, the Boone River is a medium sized gentle sloped river with relatively uniform channel properties. Therefore, the USGS channel-control model (Melching and Flores, 1999) is used.

Discussion and conclusion:
The modeling results show that the effluent, which could have an allowed maximum effluent CBOD5 level of 40 mg/l (technology-based limits for secondary treatment), ammonia nitrogen levels as shown in Table 6, and a minimum DO level of 4.3 mg/l, will not cause the DO level in the receiving stream to be below 5.0 mg/l at any time.

***E. coli*:**
This facility discharges into a Class A1 waterbody. The water quality standard for *E. coli* in a Class A1 waterbody is a geometric mean of 126 org./100 ml and a sample maximum of 235 org./100 ml from March 15th through November 15th. The criteria apply at "end-of-pipe."

E. coli decay in the discharge pipe is taken into consideration. The decay is estimated by using a first order decay model with a length of 1,440 ft, a decay rate of 1/day, and a flow velocity of 3 fps. When *E. coli* decay in the discharge pipe is taken into consideration, the limits for the protection of the Class A1 waterbody are a geometric mean of 127 org./100 ml and a sample maximum of 236 org./100 ml from March 15th through November 15th.

However, 567 IAC 62.8(2) states that "the daily sample maximum criteria for *E. coli* set forth in 567 – Chapter 61 shall not be used as an end-of-pipe permit limitation." Therefore, only the geometric mean limit of 127 org./100 ml applies.

Chloride and Sulfate:
The chloride and sulfate criteria became effective on November 11, 2009 and apply to all Class B waters. The City of Webster City STP submitted data from a site-specific hardness study where they collected 31 background hardness samples in the Boone River upstream of the outfall over the course of approximately 2.5 years. They also collected 31 hardness samples in the effluent over the course of approximately 2.5 years. The median background hardness value was 362 mg/l and the median effluent hardness value was 351 mg/l.

Chloride criteria are functions of hardness and sulfate concentration, shown as follows:

$$\text{Acute criteria} = 287.8*(\text{Hardness})^{0.205797}*(\text{Sulfate})^{-0.07452}$$
$$\text{Chronic criteria} = 177.87*(\text{Hardness})^{0.205797}*(\text{Sulfate})^{-0.07452}$$

Sulfate criteria, shown in Table 8, are functions of hardness and chloride concentration and serve as both the acute and chronic criteria.

Table 8: Sulfate criteria

Hardness (mg/l as CaCO3)	Sulfate criteria (mg/l)		
	Chloride < 5 mg/l	5 mg/l <= Chloride < 25 mg/l	25 mg/l <= Chloride < 500 mg/l
< 100	500	500	500
100<=H<=500	500	(-57.478+5.79*H+54.163*Cl)*0.65	(1276.7+5.508*H-1.457*Cl)*0.65
H> 500	500	2,000	2,000

The acute criteria apply at the end of the ZID, and the chronic criteria apply at the end of the MZ. In this case, 5.625% of the 7Q10 flow and 0.5625% of the 1Q10 flow in the Boone River at the outfall are used as the MZ and the ZID, respectively.

The default chloride concentration for both background water and effluent is 34 mg/l, while the default sulfate concentration for both background water and effluent is 63 mg/l. The limits are calculated based on an assumed sampling frequency of 1/week.

Iron:
Iron criteria are defined in the issue paper "Iron Criteria and Implementation for Iowa's Surface Waters" (November 11, 2020). A dissolved iron criterion of 1 mg/l applies at the end of the ZID for both general use and designated use streams. In this case, the ZID is 0.5625% of the 1Q10 flow in the Boone River at the outfall. Water quality-based effluent limits for iron in this WLA are expressed as total recoverable.

pH:
Iowa Water Quality Standards (IAC 567.61.3.(3).a.(2) and IAC 567.61.3.(3).b.(2)) require that pH in Class A or Class B waters "shall not be less than 6.5 nor greater than 9.0." The criteria apply at the end of the MZ, which is 25% of the 7Q10 flow in the Boone River at the outfall.

Nitrate Nitrogen:
A nitrate nitrogen TMDL for one stream segment of the Des Moines River was approved by the EPA on September 25, 2009. In that TMDL, the City of Webster City STP was assigned nitrate nitrogen wasteload allocations of an average daily load of 400 lbs/day and a maximum daily load of 1,244 lbs/day. These WLAs were translated to nitrate nitrogen limits of a maximum daily limit of 1,244 lbs/day and a monthly average limit of 760 lbs/day in the December 14, 2010 memo: "Deriving effluent limitations from the Des Moines River Nitrate TMDL." Please note that the translated Des Moines River TMDL nitrate nitrogen limits will govern the mass limits for nitrate as N and nitrate+nitrite as N.

TDS:
Effective November 11, 2009, the site-specific TDS approach is no longer applicable; instead, the new chloride and sulfate criteria became applicable. However, the TDS level should be controlled to a level such that the narrative criteria stated in IAC 567.61.3 are fulfilled.

Major Facility Acute WET Testing Ratio:
The acute whole effluent toxicity (WET) testing ratio is calculated using the ADW design flow and 0.5625% of the 1Q10 flow in the Boone River at the outfall as the ZID.

5. PERMIT LIMITATIONS:
- *Based on the Year 2006 Water Quality Standards and 2002 Permit Derivation Procedure.*

The acute and chronic WLAs are used as the values for input into the current permit derivation procedure. Under the 2002 permit derivation procedure, only for toxic parameters is the monitoring frequency considered in the calculation of final limits. The water quality-based limits are shown on Pages 1 – 3 of this report.

Appendix H: DNR Inspection Reports

- DNR Inspection Report dated August 18, 2017
- DNR Inspection Report dated October 14, 2019
- DNR Inspection Report dated April 12, 2021
- Webster City Custom Meats – Notice of Violation dated August 17, 2022
- Mary Ann’s Specialty Foods – Notice of Violation dated August 17, 2022

DEPARTMENT OF NATURAL RESOURCES

GOVERNOR KIM REYNOLDS
LT. GOVERNOR ADAM GREGG

DIRECTOR CHUCK GIPP

August 18, 2017

Ed Sadler, City Manager
City of Webster City
PO Box 217
Webster City, IA 50595

Subject: Wastewater Treatment Facility Inspection
Permit No. 4063001
Letter of Noncompliance – Sludge Recordkeeping

ATTENTION: Honorable Mayor and Council Members

Enclosed is a report of an inspection of your facility, which was conducted by Mr. Jeremy Klatt, Environmental Specialist of this office on August 9, 2017. I concur with the content of the report.

At the end of his report, Mr. Klatt has summarized his recommendations for facility operation improvements and stated required actions that must be completed in order to comply with the Iowa Administrative Code.

Please submit the monitoring report for the month of February 2017 no later than September 1.

If you have any questions concerning the report, please contact Mr. Klatt.

Sincerely,

FIELD SERVICES & COMPLIANCE BUREAU

Jeffrey B. Vansteenburg
Field Office Supervisor

JBV/jk

c: DNR Records Center

FIELD OFFICE 2, 2300 15TH ST SW, MASON CITY IA 50401
Phone: 641-424-4073 www.IowaDNR.gov Fax: 641-424-9342

IOWA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL SERVICES DIVISION
WASTEWATER TREATMENT FACILITY INSPECTION

FACILITY NO. 4063001
PAGE 1

FACILITY	Name: Wastewater Treatment Plant		Owner: City of Webster City
	Address: 400 2nd St. PO Box 217	City: Webster City, Iowa 50595	Phone: 515-832-3141
PLANT GRADE	☐ IL ☐ I ☐ IIL ☐ II ☒ III ☐ IV		
RESPONSIBLE OPERATOR	Name: Tim Danielson	Grade: III	Certification No. 9349
TREATMENT PROCESS	☒ Trickling Filter ☐ Lagoon ☒ Disinfection ☐ Activated Sludge => Modification: ☒ Other /Supplementary: RBC		
	Process Waste Description: Domestic and Industrial		
DESIGN CAPACITY	MGD: 3.3	Pounds BOD: 4150	PE (BOD): 24,412
NOW TREATING	MGD (Ave. Daily): 1.79 (3/16-6/17)	Pounds BOD: 2847 (3/16-6/17)	PE (BOD): 17,048
	Population Served: 8070 (2010 census)	Significant Industrial Contributors: ☒ Yes ☐ No Treatment Agreement(s) Adequate ☒ Yes ☐ No ☐ N/A	
RECEIVING STREAM	Stream Name: Oxbow Lakes Tributary to Boone River		
INSPECTION INFORMATION	Date of This Inspection: 08/09/2017	Time of This Inspection: 10 AM	Date of Previous Inspection: 09/21/2015 (EPA)
	Purpose of Inspection: Compliance Evaluation Inspection		
PERSONS INTERVIEWED	Name: Tim Danielson	Title: Public Works Director	
	Name:	Title:	
	Name:	Title:	
SIGNATURES	Inspector's Signature: [signature] Jeremy Klatt	Date: 8/18/17	Reviewer's Signature: [signature] David Miller — Date: 18AUG17

PERMIT COMPLIANCE SUMMARY

SELF-MONITORING	Operation Reports Submitted: ☒ Sat. ☐ Marg* ☐ Unsat.* ☐ N/A	Required Data Entered on Reports: ☒ Sat. ☐ Marg* ☐ Unsat.* ☐ N/A	Testing Adequacy: ☒ Sat. ☐ Marg* ☐ Unsat.* ☐ N/A
EFFLUENT LIMITATIONS	Self-Monitoring Results: ☒ Sat. ☐ Marg. ☐ Unsat.* ☐ N/A		
SAMPLES THIS INSPECTION	Type: None	Lab Data Attached: ☐ Yes ☒ No	
	Results: ☐ Sat. ☐ Marg. ☐ Unsat.* ☒ N/A		
	Visual Appearance of Effluent: Clear	Visual Appearance of Receiving Stream: Clear	
COMPLIANCE SCHEDULE	Compliance with Schedule: ☒ Sat ☐ Marg* ☐ Unsat.* ☐ N/A	Next Item Due: Progress Report	Date Due: 9/1/2017

Revised 01/09/13

IOWA DEPARTMENT OF NATURAL RESOURCES

WASTEWATER TREATMENT FACILITY INSPECTION

FACILITY NO. 4063001

FACILITY EVALUATION

Were deficiencies noted or significant observations made during the inspection?
Yes = See Comments Section for details
No = No deficiencies or significant observations were noted.
Lack of entry = Item not applicable or not observed.

ITEM	YES	NO		YES	NO
1. COLLECTION SYSTEM			9. SLUDGE HANDLING AND DISPOSAL		
a. Operation and Maintenance	☐	☒	a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒	b. Physical Condition	☒	☐
c. Dry Weather Capacity	☐	☒	c. Capacity	☐	☒
d. Infiltration/Inflow	☐	☒	d. Effectiveness	☐	☒
e. By-pass	☒	☒	e. Final Disposal, Solids	☒	☐
			f. Final Disposal, Liquids	☒	☐
2. LIFT STATION(S) (COLLECTION SYSTEM)					
a. Operation & Maintenance	☐	☒	10. LAGOON STRUCTURES ( )		
b. Physical Condition	☐	☒	a. Maintenance	☐	☒
c. Capacity	☐	☒	b. Physical Condition	☐	☒
d. Reliability/Emergency Operation	☐	☒	c. Capacity	☐	☒
3. INDUSTRIAL WASTE PRE-TREATMENT			d. Cell Configuration	☐	☒
a. Waste Toxicity/Compatibility	☒	☐	e. Storage/Drawdown Management	☐	☒
b. Strength Reduction	☐	☒	11. FLOW MEASUREMENT		
c. Affect on Treatment Plant	☐	☒	a. Operation & Maintenance	☐	☒
4. PRE-TREATMENT UNITS (this facility)			b. Capacity	☐	☒
a. Operation & Maintenance	☒	☐	c. Continuity	☐	☒
b. Physical Condition	☐	☒	d. Location/Method/Effectiveness	☐	☒
c. Capacity	☐	☒	12. PUMPING		
d. Effectiveness	☐	☒	a. Operation & Maintenance	☐	☒
5. PRIMARY TREATMENT			b. Physical Condition	☐	☒
a. Operation & Maintenance	☒	☐	c. Capacity	☐	☒
b. Physical Condition	☐	☒	d. Reliability/Emergency Operation	☐	☒
c. Capacity	☐	☒	13. MISCELLANEOUS		
d. Sludge/Scum Removal	☐	☒	a. Location	☐	☒
e. Effectiveness	☐	☒	b. Odors	☐	☒
6. SECONDARY TREATMENT			c. Emergency Operation	☐	☒
a. Operation & Maintenance	☒	☐	d. By-pass(es)	☐	☒
b. Physical Condition	☒	☐	e. Equipment	☐	☒
c. Capacity	☐	☒	f. Buildings & Grounds	☐	☒
d. Recirculation	☐	☒	g. Other **(Lab Certification)**	☒	☐
e. Freezing	☐	☒	14. STAFFING, OPERATOR CERTIFICATION		
f. Effectiveness	☐	☒	a. Operator, Direct Responsibility	☐	☒
7. FINAL SETTLING			b. Shift Operator(s)	☐	☒
a. Operation & Maintenance	☐	☒	c. General Staffing	☒	☐
b. Physical Condition	☐	☒	15. SUPPLEMENTARY		
c. Capacity	☐	☒	a. Permit Availability	☐	☒
d. Effectiveness	☐	☒	b. Operation Reports Availability	☐	☒
8. SUPPLEMENTARY TREATMENT			c. Equipment Records Maintenance	☐	☒
a. Operation & Maintenance	☐	☒	d. Previously Noted Deficiencies	☐	☒
b. Physical Condition	☐	☒	e. Improvements	☒	☐
c. Capacity	☐	☒	f. Domestic/Industrial Growth	☐	☒
d. Effectiveness	☐	☒	g. Recommendations	☒	☐
			h. Required Actions	☒	☐

FACILITY DESCRIPTION

The wastewater treatment facility consists of 2 barscreens, comminutor (Muffin Monster), 2 aerated grit chambers, 2 pumping stations, 3 primary clarifiers, 1 trickling filter, 20 RBC units, 2 final clarifiers, chlorine detention tank (2 chlorinators), dechlorination with sodium bisulfite, 1 fixed-cover primary anaerobic digester (heated), 1 floating cover secondary digester, gas recirculation, heat exchanger, 2 sludge drying beds and a 1.2 million gallon sludge storage tank. Specifications for process equipment are on file at the treatment plant and at the DNR Field Office in Mason City.

PERMIT COMPLIANCE SUMMARY

Discharge from this facility is authorized by NPDES Permit No. 40-63-0-01, which was issued March 1, 2016, and will expire on February 28, 2021. The City has the ability to discharge at two separate locations; this is reflected in the new permit. Outfall 001 is the discharge to the Oxbow Lakes, which flow to the Boone River while Outfall 003 is a direct discharge to the Boone River. Limits for some parameters change based on the location of discharge.

The monthly operation reports (MOR's) were reviewed for compliance since the issuance of the new permit (March 2016-June 2017). During this period, the City discharged exclusively to Outfall 001. The following permit effluent violations were reported during the reviewed period:

Copper – Concentration and mass violations occurred in November of 2016 and May of 2017.

E. coli – The geomean limit was exceeded in August of 2016.

pH – The maximum pH limit was exceeded in March of 2017.

Total Suspended Solids – The average and maximum concentration limits were exceeded in November of 2016. Additionally, the maximum TSS concentration limit was exceeded in August, September and October 2016. Lastly, the maximum mass limit was exceeded in September of 2016.

Annual toxicity testing was completed in July of 2016; the effluent passed both toxicity tests. The 2017 toxicity was recently taken and results have not been received.

The City inadvertently sent a blank monitoring report for February of 2017. Please update and resubmit the February 2017 monitoring report.

Compliance Schedule

The new permit has a compliance schedule for meeting limits for cadmium, copper, silver, zinc, and total residual chlorine. The facility was required to submit a compliance strategy by September of 2016. This report was submitted in February of 2017 and indicated that the existing equipment will be evaluated to determine if the TRC limit can be met without upgrades. For metals, a site-specific study will be conducted in hopes of revising the limits. However, the City is currently contemplating a plant upgrade to an activated sludge treatment system (see item 15e).

Nutrient Reduction Strategy

The City of Webster City is also subject to the State's Nutrient Reduction Strategy. The permit requires that the City submit a report that evaluates the feasibility and reasonableness of reducing the amounts of nitrogen and phosphorus discharged into surface water. The report is due by March 1, 2018.

FACILITY EVALUATION

1-e Bypassing

Bypassing occurred on March 7, 2017, due to a power outage at the plant. The power was out for about 60 minutes and sewage flowed out of a manhole near the plant. Once power was restored the bypass subsided.

3-a Industrial Pretreatment

The City has TAs with Mary Ann's Specialty Foods (Mary Ann's) and Webster City Custom Meats (Custom Meats). The monitoring data for both industries was reviewed for the period of March 2016 to June 2017. Custom Meats exceeded BOD loading limits in two months, flow limits in two months, pH limits during seven months and TKN during one month. Mary Ann's exceeded BOD limits during two months, flow limits during four months, pH limits during eight months, TKN limits during two months and TSS limit during one month.

VeroBlue, a fish grower/processor has purchased a portion of the old Electrolux facilities in Webster City and is currently growing fish. The City has a treatment agreement with the industry, though the industry is not a 'Significant Industrial User' and therefore, the agreement was not incorporated into the permit. VeroBlue does plan to begin processing fish in the facility. If the processing results in being designated as a Significant Industrial User, the treatment agreement must be submitted to the DNR wastewater section for review and inclusion in the permit

Mr. Danielson indicated that he anticipates reworking the agreements for Mary Ann's and Custom Meats in the near future as plans to expand the facility progress.

4a Pre-treatment

Grit is placed in a drying bed for dewatering and then is mixed with woodchips and stockpiled across the street and the City's compost operation. There was a significant accumulation of grit in the drying beds at the time of inspection. Grit must be ultimately disposed either by land application in accordance with Chapter 567 IAC 121, after meeting pathogen reduction and vector reduction requirements, or by disposal at the landfill. If the City decides to land apply the grit, contact the DNR field office for land application requirements.

5a Primary Clarifier

One of the City's three primary clarifiers is being rebuilt with new concrete walls, weirs, and troughs and is currently out of service. Mr. Danielson indicated that the construction crew is waiting on baffles and weirs to finish the project. Construction Permit No. 2016-0356-S was obtained for the project.

6-a,b Secondary Treatment

Four of the 20 RBC units are currently not operational. As of now, the City is not intending to make repairs to these units as they prepare to upgrade secondary treatment to activated sludge. Should the City decide against the plant upgrade, these units will need to be repaired.

9-b,e Biosolids Disposal

The primary digester is also under repair and is currently not being used; this work was also authorized by Construction Permit No. 2016-0356-S. Past sludge report records have indicated that the pathogen reduction is met by achieving the required detention time in the anaerobic digester; however, Mr. Danielson reported that he has never seen the calculation to document that the detention time is adequate.

With the primary digester out of commission, it is unlikely that the required detention time is being achieved. The City must either demonstrate that the required detention time is achieved or meet the pathogen reduction requirement by other means.

The 5-year application was completed by V & K Engineering in May of 2016 and the report recommends that the City demonstrate pathogen reduction by calculating the geometric mean of fecal coliform of seven samples of the sewage sludge and showing a concentration of less than 2,000,000 MPN/gram. I recommend that that the City begin using this method annually, as the City has not calculated the detention time in the digester.

Sludge was hauled in the fall of 2016 and the sludge application records were reviewed. The sludge was sampled for pollutants required in Chapter 67 and all pollutants were below ceiling concentrations. Vector reduction was met by injecting the sludge below the soil surface. The report indicated that pathogen reduction was met by detention time in the anaerobic digester.

Mr. Danielson was not able to locate the 2015 sludge application records, although the results of the sludge sampling were located in the May 2016, 5-year sludge plan. All pollutants were below ceiling limits in the samples taken both in March and October of 2015. The City must ensure that all sludge application records are maintained on-site for five years (the required recordkeeping items are attached to this report).

<u>9f</u> <u>Sludge Drying Beds</u>

The previous inspection report noted that the City also disposes of grit, etc. from sewer cleaning in the sludge drying beds. In March of 2013, the City asked the Department about disposal of this material in their dead animal (road kill) compost pile. At that time the Department notified the City that this material must be handled in accordance with the sewage sludge regulations. See Item 4a above regarding disposal options.

<u>13-g</u> <u>Laboratory Certification</u>

There has been no change in the laboratories used for the various analyses required by this facility. The City's lab, AgSource Labs, and SHL, are all being used and remain certified.

<u>14-c</u> <u>General Staffing</u>

Tim Danielson was named Public Works Director in July 2011 and is the responsible operator for the facility. Mr. Danielson currently is certified as a Grade III wastewater operator.

<u>15e</u> <u>Improvements</u>

The City is making plans to expand their wastewater treatment facility. A project initiation meeting between the City and the DNR occurred in December of 2016 (DNR Project # 2017-0216A). Mr. Danielson reported that the City currently is hoping to construct new secondary treatment facilities at a new location, south of Highway 20. Preliminary treatment and primary clarification would occur at the current facilities.

RECOMMENDATION

1. To meet pathogen reduction requirements, take seven fecal coliform samples during sludge hauling and calculate a geomean.

2. Contact the DNR Field Office if grit from the drying beds will be land applied.

REQUIRED ACTIONS

1. Comply with all effluent limitations in the permit per Subrule 567 IAC 64.3(1).

2. Submit the monitoring report for February 2017 per Subrule 567 IAC 64.3(1).

3. Continue to enforce the treatment agreement with industrial contributors per Subrules 567 IAC 64.3(1) and 567 IAC 62.1(6).

4. Ensure the pathogen reduction requirement is being met for application of sewage sludge per Subrule 567 IAC 67.8(1).

5. Maintain sludge application records for five years per Subrule 567 IAC 67.8(4).

6. Properly dispose of grit accumulations in the drying bed by either land application or at the landfill per Rule 567 IAC 100.4 (455B).

IOWA DEPARTMENT OF NATURAL RESOURCES

GOVERNOR KIM REYNOLDS
LT. GOVERNOR ADAM GREGG

DIRECTOR KAYLA LYON

October 14, 2019

City of Webster City
City Hall, P.O. Box 217
Webster City, IA 50595

Subject: Wastewater Treatment Facility Inspection, Permit No. 4063001
Notice of Violation – Compliance Schedule, Effluent Limits

ATTENTION: Honorable Mayor and Council Members

Sheila Kenny, Environmental Specialist with this office, conducted an inspection of your facility on July 16, 2019. A field inspection report was completed and is enclosed for your file. I concur with the content of the report.

At the end of this report, Ms. Kenny has summarized her recommendations for facility operation improvements and stated required actions that must be completed in order to comply with the Iowa Administrative Code. Failure to comply can result in referral to the Department's Legal Services Section for consideration of enforcement action.

Please submit a written response to this office within **30 days of receipt** of this letter, stating the measures you have taken, or will take, to comply with the required actions.

If you have any questions concerning the report, please contact Ms. Kenny at 641-424-4073.

Sincerely,

FIELD SERVICES & COMPLIANCE BUREAU

Trent Lambert
Field Office Supervisor

TL/sk

Enclosure: Effluent Limits Violations Reports
Section 13.11 of the Iowa Wastewater Facilities Design Standards

c: DNR Records Center

FIELD OFFICE 2, 2300 15TH ST SW, MASON CITY IA 50401
Phone: 641-424-4073 www.iowadnr.gov Fax: 641-424-9342

Iowa Department of Natural Resources
Wastewater Treatment Facility Inspection Form

NPDES Permit #: 4063001 **Page 1**

FACILITY INFORMATION

Facility:
Name: **Webster City Wastewater Treatment Facility** Plant Grade: **WW-III**
Responsible Authority/Owner: **City of Webster City**
Address: **City Hall, P.O. Box 217** Phone: **515-832-9185**
City: **Webster City** State: **IA** Zip: **50595**

Responsible Operator:
Name: **Tim Danielson** Grade: **WW-III** Certification Number: **9349**

General Description:
This facility consists of a collection system with 3 lift stations and a treatment plant comprised of the following units or processes: a comminutor, a bypass channel with a bar screen, an aerated grit chamber, cyclone grit removal and grit washer, 3 primary clarifiers, 1 uncovered trickling filter, 20 rotating biological contactors (RBCs) arranged in 5 trains of 4 with aeration, 2 final clarifiers, a chlorine contact chamber with gas chlorination, and sodium bisulfite feed for dechlorination. Sludge is stabilized in a primary anaerobic digester with a fixed cover and a secondary digester with a floating cover. Sludge may be dried in the sludge drying bed or stored in a 1.2 million gallon storage tank prior to disposal by land application.

Design Capacity:
Average MGD: **3.300** Maximum MGD: **6.00**
Pounds BOD/Day: **4150** PE (BOD): **24,850**

Now Treating:
Average MGD: **1.910** Maximum MGD: **7.887**
Pounds BOD/Day: **3714** PE (BOD): **22,237**
Period Reviewed: **August 2017-June 2019** Population Served: **8070 (2010 Census)**

Receiving Stream:
Outfall 001 - Unnamed tributary to Oxbow Lake, Tributary to the Boone River
Outfall 003 – Boone River

INSPECTION INFORMATION

Inspection:
Date and Time of Inspection: **07/16/19 – 1pm** Purpose: **Compliance Evaluation**
Date of Last Inspection: **08/09/17**

Persons Interviewed:
Name: **Tim Danielson** Title: **Wastewater Superintendent**

NPDES PERMIT COMPLIANCE SUMMARY

Self-Monitoring:
Operation Reports Submitted: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Required Data on Reports: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Testing Adequacy: ☒ Sat. ☐ Marg.* ☐ Unsat.*

Effluent Limitations:
Self-Monitoring Results:
☐ Compliance ☒ Infrequent Non-Compliance* ☐ Significant Non Compliance*

Samples this Inspection:
Type: **None** Lab Data Attached? ☐ Yes ☒ No Results: ☐ Sat. ☐ Marg.* ☐ Unsat.*
Visual Appearance of Effluent: **Clear**
Visual Appearance of Receiving Stream: **Clear**

Compliance Schedule:
Compliance w/Schedule:
☐ Sat. ☐ Marg.* ☒ Unsat.* ☐ NA Next Items Due: **Submit Progress Report for Nutrient Reduction Schedule by 03/01/2020. Progress reports for the metals schedule were due 06/01/18 and 06/01/19.**

* Additional details in the narrative report

AUTHENTICATION

Inspector: **Sheila Kenny** [signature] Date: **10/14/19**
Reviewer: **David Miller** [signature] Date: 17 OCT 19

Updated 10/22/2015 cmc

DNR Form 542-3158

Iowa Department of Natural Resources
Wastewater Treatment Facility Inspection Form

NPDES Permit #: 4063001

FACILITY EVALUATION

Were deficiencies noted or significant observations made during the inspection?

Yes = See Comments Section for details
No = No deficiencies or significant observations were noted
Lack of Entry = Item not applicable or not observed.

Item	Yes	No
1. Collection System		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Dry Weather Capacity	☐	☒
d. Infiltration/Inflow	☒	☐
e. Bypass(es)	☒	☐
2. Lift Station(s) (Collection System)		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/Emergency Operation	☒	☐
3. Industrial Waste Pre-Treatment		
a. Significant Industrial Users	☒	☐
b. Waste Toxicity/ Compatibility	☐	☒
c. Strength Reduction	☐	☒
d. Effect on Treatment Plant	☐	☒
4. Preliminary Treatment		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
5. Primary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Sludge/Scum Removal	☐	☒
e. Effectiveness	☐	☒
6. Secondary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Recirculation	☐	☒
e. Freezing	☐	☒
f. Effectiveness	☐	☒
7. Final Settling		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
8. Supplementary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒

Item	Yes	No
9. Sludge Handling and Disposal		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
e. Final Disposal, Solids	☐	☒
f. Final Disposal, Liquids	☐	☒
10. Lagoon Structures		
a. Maintenance	☐	☐
b. Physical Condition	☐	☐
c. Capacity	☐	☐
d. Cell Configuration	☐	☐
e. Storage/Drawdown Management	☐	☐
11. Flow Measurement		
a. Operation and Maintenance	☒	☐
b. Capacity	☐	☒
c. Continuity	☐	☒
d. Location. Method/ Effectiveness	☐	☒
12. Pumping		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/ Emergency Operation	☐	☒
13. Miscellaneous		
a. Location	☐	☒
b. Odors	☐	☒
c. Emergency Operation	☒	☐
d. Bypass(es)	☐	☒
e. Equipment	☐	☒
f. Buildings & Grounds	☐	☒
g. Lab Certification	☐	☒
h. Other	☐	☐
14. Staffing, Operator Certification		
a. Operator, Direct Responsibility	☐	☒
b. Shift Operator(s)	☐	☒
c. General Staffing	☐	☒
15. Supplementary		
a. Permit Availability	☐	☒
b. Operation Reports Availability	☐	☒
c. Equipment Records Maintenance	☐	☒
d. Previously Noted Deficiencies	☐	☒
e. Improvements	☐	☒
f. Domestic/Industrial Growth	☐	☒
g. Recommendations	☒	☐
h. Required Actions	☒	☐

INTRODUCTION

A compliance inspection was conducted at the Webster City WWTP on July 16, 2019. The inspection involved a review of City records, discussions with the operator identified above, and a walk through of the treatment plant. The purpose of the inspection was to determine the compliance status of the facility.

NPDES PERMIT COMPLIANCE SUMMARY

Discharge from this facility is authorized by NPDES permit #4063001. The NPDES permit was issued on March 1, 2016, and has an expiration date of February 28, 2021.

Self-Monitoring Results
Refrigerated composite samplers are used to collect 24-hour composite samples of the influent and effluent flow at this facility. There are effluent samplers pre- and post-disinfection, but Mr. Danielson reported that the post-disinfection sampler was down for a few weeks while they awaited the necessary parts to repair it. In the interim, they have been reporting result from the pre-disinfection sampler. The City should work to repair the sampler and return it to service as soon as possible. The tubing in the composite samplers should be watched closely for bacterial growth as dirty lines may lead to higher sample results that are not representative of the typical wastewater at this facility. Mr. Danielson stated that they clean the tubing on both samplers as needed.

Operational monitoring and compliance sample analysis for BOD_5, $CBOD_5$, TSS, SS, NH_3-N, TRC, pH, DO, and temperature is conducted at the certified in-house laboratory (Iowa Lab #314). Samples for NO_3-N, TKN, Total N, Total P, metals, toxicity, and *E. coli* are taken to the State Hygienic Laboratory in Ankeny (Iowa Lab #397) for analysis. Samples are hand-delivered to comply with the 6-hour maximum hold time for *E. coli.*

To ensure accurate readings, Mr. Danielson reported that they perform a three-point (4.0, 7.0, and 10.0) calibration of the pH meter and measure a known TRC standard five days per week. They also have a certified thermometer in the lab. Proper calibration logs are being maintained to document these calibration activities in accordance with Subrule 567 IAC 63.2(1).

The operation reports submitted for this facility since August 2017 indicate that there were two minor violations of the effluent TRC limits and three significant violations of the effluent *E. coli* limit. See the enclosed Effluent Limit Violations report for details. The discharge of untreated or partially treated wastes which exceed permit effluent limits is a violation of Subrule 567 IAC 64.3(1), and is prohibited by Section 455B.186 of the Code of Iowa. Action should be taken to ensure that further violations do not occur. Mr. Danielson reported that they made some physical changes to the chlorine room in April 2019 as the piping layout and equipment failures were the primary causes of these violations. **As a reminder, Rules 567 IAC 63.12(455B) and 63.15(455B) require that all permittees report instances of non-compliance, including violations of effluent limitations, to the Department.** See permit conditions 13 and 14 for additional information.

Operation Reports Submitted; Required Data Entered on Reports
The operation reports were submitted on time and all required data was reported. All operation records, including Monthly Operation Reports (MORs), lab results, and chain-of-custody documents must be maintained for a minimum of three years. The City is maintaining both paper and electronic records for this facility. The MORs have been signed in accordance with the rules, but Mr. Danielson was encouraged to also date the MORs so that an accurate timeline can be established in the records.

Compliance Schedules
The current NPDES permit for Webster City contains a compliance schedule to meet more stringent effluent limits for metals and a construction schedule for nutrient reduction. Mr. Danielson reported that they have been working with Greg ...dt, P.E. from Bolton & Menk, on designing a new activated sludge plant.

The metals compliance schedule requires annual progress reports on June 1 of each year; however, to date, the Department has not received the progress reports for 2018 or 2019. The implementation schedule and the first progress report were both submitted more than 90 days after the due date as well. **Therefore, the City is current in significant non-compliance for failure to follow the compliance schedule and must submit a progress report immediately.** Mr. Danielson indicated that the City is in the process of collecting stream sampling data in order to request site-specific limits for metals. The City should ensure that they are moving forward with this project in order to meet the final compliance deadline of February 1, 2021.

The construction schedule for nutrient reduction requires annual progress reports on March 1 of each year. The 2019 report indicates that the City is working with industrial users to determine appropriate design flows and loading rates. The City must complete construction of the necessary upgrades by March 1, 2024. The City will then have a six-month optimization period followed by a one-year monitoring period before final nutrient limits are established.

FACILITY EVALUATION

1d. COLLECTION SYSTEM – Infiltration/Inflow

Infiltration is the entrance of extraneous clear water into the collection system via loose joints, cracked or broken pipes, poorly constructed manholes, etc. Inflow is the entrance of extraneous clear water into the collection system via improper connections such as storm sewers, foundation drains, roof drains, etc. Infiltration and inflow (I/I) increase the cost of operation and maintenance of the lift stations and treatment facility. Influent flows exceeding the facility's design capacity shorten the detention time and may make compliance with your permit's effluent limits more difficult. Mr. Danielson indicated that they do see increased flows after rainfall events and the data provided since the previous inspection indicates flows of up to 7.519 MGD, which exceeds the maximum wet weather design flow for this facility. Therefore, it is recommended that the City continue to identify and eliminate sources of infiltration/inflow to the collection system. City ordinances that prohibit sump pumps and roof drains from being discharged into the sanitary sewer are also recommended and should be enforced. Mr. Danielson reported that the City conducted sump pump inspections about 4-5 years ago and disconnected any illegal connections they discovered. He also stated that the City has money budgeted each year for televising and repairs to the collection system.

1e. COLLECTION SYSTEM – Bypasses

A wastewater bypass occurred in April 2018 due to a power outage. As a reminder, bypassing is prohibited under Rule 567 IAC 63.6(455B); therefore, the City should work to prevent all future bypasses. Written bypass reports are now required to be submitted within five days following a bypass event. An electronic report form is now available for use upon request.

2a. and 2d.LIFT STATION

There are three lift stations in town to pump all wastewater to the treatment plant. Mr. Danielson reported that each lift station is equipped with two pumps that are automatically alternated to distribute the wear between the pumps and ensure that both pumps are working properly. The lift stations are equipped with autodialer alarm systems which will call the operator should a problem arise, but Mr. Danielson reported that they do not have emergency generators at the lift stations. **Section 13.11 of the Iowa Wastewater Facilities Design Standards requires that all lift stations have an emergency means of operation such as a generator or redundant power supply, which can be in place within 30 minutes following a power outage.** The City must submit information detailing how they will comply with this requirement.

3a. SIGNIFICANT INDUSTRIAL USERS (SIUs)

The City currently has treatment agreements for two significant industrial users – Mary Ann's Specialty Foods and Webster City Custom Meats, Inc. Review of the data submitted for these industries since August 2017 shows that both industries have frequent violations of the established treatment agreement limits. See the enclosed Effluent Limits Violations reports for details. The discharge of wastewater into a publicly owned treatment works in volumes or quantities in excess of those to which a major contributing industry is committed in a treatment agreement is a violation of Subrule 567 IAC 62.1(6). The discharge limits established in the treatment agreement have also been incorporated into the NPDES permit issued to the City. Failure to enforce treatment agreement limits constitutes a violation of Subrule 567 IAC 64.3(1). The City must either enforce the limits in the treatment agreements, or negotiate new treatment agreements with limits the industries can meet.

Mr. Danielson indicated that the City signed a new treatment agreement with Mary Ann's Specialty Foods this spring. If you have not already done so, the City must submit this new agreement to Ben Hucka, IDNR Pretreatment Coordinator in Des Moines, and to IDNR Field Office 2 in Mason City. Once the agreement has been approved, the new limits will be incorporated into the City's NPDES permit. Mr. Danielson also stated that the City issues monetary penalties for exceedances of the treatment agreement limits; however, additional action may be needed to ensure industrial compliance is maintained.

It is recommended that periodic industrial surveys be completed to ensure that all SIUs are identified and properly regulated. See page 31 of the NPDES permit for more information on SIUs.

5a. PRIMARY TREATMENT and 7a. FINAL SETTLING – Operation and Maintenance
Even flow of wastewater was noted over the weirs in each of the primary and final clarifiers. Heat lamps are present on the scum boxes in all clarifiers to help prevent freezing in the winter. The skimmer arms appeared to adequately remove scum. Mr. Danielson reported that the clarifiers are cleaned monthly in the winter and every 1-2 weeks in the summer to remove any solids or filamentous growth.

6a. SECONDARY TREATMENT – Operation and Maintenance
The trickling filter distributor arms are hydraulically driven to distribute wastewater over the rock media. Mr. Danielson reported that the recirculation pump was recently repaired. No mud balls were observed and no pooling or ponding of water was evident in the trickling filter during this inspection. Mr. Danielson stated that the openings in the distributor arms are cleaned about once every two weeks in the summer and about monthly in the winter to prevent plugging.

8a. SUPPLEMENTARY TREATMENT – Operation and Maintenance
Only one half of the chlorine contact chamber is in use. The chlorine and sodium bisulfite are fed automatically. Mr. Danielson reported that a new chlorinator and injector were installed the month prior to this inspection.

9a. SLUDGE HANDLING AND DISPOSAL
Sludge is automatically pulled from the primary clarifiers. Mr. John West reported that they pump about 1400-1800 gallons per day from each of the clarifiers and maintain sludge blankets of about 18-24". Sludge from the final clarifiers is automatically pulled and flows by gravity back to the headworks of the plant. The sludge blanket in the final clarifiers is approximately 3-6" deep. They pull supernatant from the digesters every Friday and return a total of about 100,000 gallons per month to the head of the plant.

Mr. Danielson reported that the south sludge drying bed was removed and filled in. The remaining drying bed is used primarily for grit. The City also utilizes the services of HydroKleen to clean out sections of the sanitary sewer. Any waste from this process is also placed in the drying bed.

All municipalities disposing of sewage sludge by land application must comply with the requirements of Chapter 67 of the Iowa Administrative Code (IAC) and the National Sewage Sludge Program contained in Title 40 Code of Federal Regulations Part 503. The City's biosolids management plan and application records were reviewed during this inspection. Overall, it appears that proper sludge records are being maintained; however, records indicate that this facility land applied about 50 dry tons of sludge in 2018, but the biosolids plan, which was developed in 2016, indicates production levels of about 220 dry tons. **As a reminder, Rule 567 IAC 67.4(455B) requires that the City's biosolids management plan be reviewed and updated annually.**

11a. FLOW MEASUREMENT
The influent and effluent flows at this facility are measured by Parshall Flumes with ultrasonic flow meters. The meters should be calibrated in accordance with the manufacturer's recommendations. Mr. Danielson stated that an outside company calibrates the meters each year. Documentation of such calibration activities must be kept in the facility records for a minimum of three years.

. MISCELLANEOUS – Emergency Operation
ere is no emergency generator at the treatment plant, but Mr. Danielson stated that they have a redundant power supply.

Facility Name: Webster City Wastewater Treatment Facility **Page 6**

NPDES Permit #: 4063001 **Inspection Date:** 07/16/19

SUMMARY

Overall, the facility appears to be properly operated and maintained, but it is nearing its design capacity. The City is in the process of planning facility upgrades to an activated sludge plant to meet more stringent effluent metals limits and the nutrient reduction construction schedule. The City is in significant non-compliance for failure to submit annual progress reports for the metals compliance schedule. Infrequent effluent violations and numerous treatment agreement violations from both industrial users were noted since the last inspection.

REQUIREMENTS

1. Comply with all permit effluent limits per Subrule 567 IAC 64.3(1) and provide proper notification of any non-compliance issues per Subrules 567 IAC 63.12(455B) and 63.15(455B).
2. Submit the delinquent progress reports regarding the metals compliance schedule and comply with all other deadlines in the schedule per the permit and Subrule 567 IAC 64.3(1).
3. Submit information detailing how the City will comply with the emergency operation requirements for all lift stations pursuant to Section 13.11 of the Iowa Wastewater Facilities Design Standards.
4. Review and update the biosolids management plan annually in accordance with Rule 567 IAC 67.4(455B).

RECOMMENDATIONS

1. Budget funds annually for I/I work as the collection system will deteriorate with age.
2. Work to eliminate all wastewater bypasses.
3. Work with existing industrial users to ensure compliance with all treatment agreement limits. Conduct periodic industrial surveys to ensure that all SIUs are identified and properly regulated.

13.11 EMERGENCY OPERATION

Pumping stations and collection systems shall be designed to prevent or minimize bypassing of wastewater. For use during possible periods of extensive power outages, mandatory power reductions, or uncontrolled storm events, an emergency means of operation shall be provided, such as a second, independent power source connected to the station, an engine-driven generator, engine-driven standby pumps or portable pumps or portable generator. The standby facilities must be capable of being placed in operation at the site within 30 minutes of the onset of the emergency condition (preferably before the liquid level in the wet well rises to the overflow level).

Engine-driven pumps must meet all applicable requirements in Section 13.4 of these standards. Provisions for backup power sources must comply with the requirements of Section 14.5.3 of these standards.

In addition to the required emergency means of operation, where overflows affect public water supplies, a high level wet well overflow and a storage/detention basin, or tank, shall be provided having 2-hour detention capacity at the anticipated overflow rate. Storage/detention tanks, or basins, shall be designed to drain by gravity or pumping to the station wet well.

Consideration should be given to providing a high level wet well overflow to suppplement alarm systems and required standby facilities in order to prevent backup of wastewater into basements, or other discharges which may cause severe adverse impacts on public interests, including public health and property damage.

Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		DAILY MAXIMUM - MG/L		AVERAGE - GEOMEAN	
		Limit	DMR	Limit	DMR
Outfall: 001					
10/2017	E. COLI			630	1343.89
8/2018	E. COLI			630	4829.23
10/2018	E. COLI			630	11,093.33
	TRC	0.336	0.34		
11/2018	TRC	0.336	0.34		

Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		DAILY MAXIMUM - MG/L		AVERAGE - GEOMEAN	
		Limit	DMR	Limit	DMR
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8/2018	E. COLI			630	4829.23
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	TRC	0.336	0.34		
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Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		AVERAGE - LBS/DAY		DAILY MAXIMUM - LBS/DAY		AVERAGE - MGD		DAILY MAXIMUM - MGD		DAILY MAXIMUM - STD UNITS		DAILY MINIMUM - STD UNITS	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
MARY ANN'S SPECIALTY FOODS													
Outfall: 001													
8/2017	BOD5			400	457.2977457								
	PH									11	11.56		
9/2017	BOD5	300	362.5544575	400	629.0850991								
	FLOW							0.04	0.043602				
10/2017	BOD5	300	879.9033057	400	3027.290146								
	FLOW					0.03	0.0382463	0.04	0.34669				
	TKN	30	86.9418082	40	303.596433								
	O&G			125	144.56973								
	PH									11	11.93	6	5.33
	TSS	150	214.503232	250	809.590488								
11/2017	PH											6	5.52
2/2018	PH											6	5.52
5/2018	PH									11	11.78		
7/2018	FLOW							0.04	0.040706				
8/2018	TKN			40	42.5470104								
9/2018	PH											6	5.98
10/2018	BOD5	300	376.026414	400	430.674264								
11/2018	BOD5	300	476.7657744	400	748.86111								
	TKN	30	41.0213908	40	53.144982								
	O&G			125	346.8917916								
	PH											6	5.79
12/2018	BOD5			400	444.0216								
	FLOW					0.03	0.030767	0.04	0.042268				
	TKN			40	41.627025								
1/2019	FLOW							0.04	0.19652				
6/2019	FLOW							0.04	0.054489				

Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		AVERAGE - LBS/DAY		DAILY MAXIMUM - LBS/DAY		AVERAGE - MGD		DAILY MAXIMUM - MGD		DAILY MAXIMUM - STD UNITS		DAILY MINIMUM - STD UNITS	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
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Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		AVERAGE - LBS/DAY		DAILY MAXIMUM - LBS/DAY		AVERAGE - MGD		DAILY MAXIMUM - MGD		DAILY MAXIMUM - STD UNITS		DAILY MINIMUM - STD UNITS	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
WEBSTER CITY CUSTOM MEATS													
Outfall: 001													
9/2017	O&G			125	317.9013427								
11/2017	FLOW					0.08	0.0800903	0.11	0.12312				
	TSS			300	349.5318936								
12/2017	BOD5	600	853.4107703	900	1397.184254								
	FLOW							0.11	0.124317				
	TKN			80	91.4823023								
	PH											6	5.1
6/2018	PH									11	12.99		
7/2018	BOD5			900	1085.48019								
8/2018	BOD5	600	645.512764	900	1967.492736								
	FLOW							0.11	0.42224				
	PH											6	4.63
10/2018	FLOW							0.11	0.128551				
11/2018	FLOW							0.11	0.121475				
	PH									11	12.63		
12/2018	FLOW							0.11	0.12989				
1/2019	PH									11	11.29		
3/2019	[illegible]									11	12.1		
4/2019	BOD5			900	1004.489616								
	PH											6	4.72

Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		AVERAGE - LBS/DAY		DAILY MAXIMUM - LBS/DAY		AVERAGE - MGD		DAILY MAXIMUM - MGD		DAILY MAXIMUM - STD UNITS		DAILY MINIMUM - STD UNITS	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
WEBSTER CITY CUSTOM MEATS													
Outfall: 001													
9/2017	O&G			125	317.9013427								
11/2017	FLOW					0.08	0.0800903	0.11	0.12312				
	TSS			300	349.5318936								
12/2017	BOD5	600	853.4107703	900	1397.184254								
	FLOW							0.11	0.124317				
	TKN			80	91.4823023								
	PH											6	5.1
6/2018	PH									11	12.99		
7/2018	BOD5			900	1085.48019								
8/2018	BOD5	600	645.512764	900	1967.492736								
	FLOW							0.11	0.42224				
	PH											6	4.63
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11/2018	FLOW							0.11	0.121475				
	PH									11	12.63		
12/2018	FLOW							0.11	0.12989				
1/2019	PH									11	11.29		
3/2019	PH									11	12.1		
4/2019	BOD5			900	1004.489616								
	PH											6	4.72

April 12, 2021

City of Webster City
City Hall, P.O. Box 217
Webster City, IA 50595

Subject: Wastewater Treatment Facility Inspection, Permit No. 4063001
Letter of Noncompliance – Compliance Schedule Reporting

ATTENTION: Honorable Mayor and Council Members

Jeremy Klatt, Environmental Specialist with this office, conducted an inspection of your facility on March 10, 2021. A field inspection report was completed and is enclosed for your file. I concur with the content of the report.

At the end of this report, Mr. Klatt has summarized his recommendations for facility operation improvements and stated required actions that must be completed in order to comply with the Iowa Administrative Code.

If you have any questions concerning the report, please contact Mr. Klatt at 641-424-4073.

Sincerely,

FIELD SERVICES & COMPLIANCE BUREAU

Trent Lambert
Field Office Supervisor

TL/jk

c: DNR Records Center

Iowa Department of Natural Resources
Wastewater Treatment Facility Inspection Form

NPDES Permit #: 4063001

FACILITY INFORMATION

Facility:
Name: **Webster City Wastewater Treatment Facility** Plant Grade: **WW-III**
Responsible Authority/Owner: **City of Webster City**
Address: **City Hall, P.O. Box 217** Phone: **515-832-9185**
City: **Webster City** State: **IA** Zip: **50595**

Responsible Operator:
Name: **Tim Danielson** Grade: **WW-III** Certification Number: **9349**

General Description:
This facility consists of a collection system with 3 lift stations and a treatment plant comprised of the following units or processes: a comminutor, a bypass channel with a bar screen, an aerated grit chamber, cyclone grit removal and grit washer, 3 primary clarifiers, 1 uncovered trickling filter, 20 rotating biological contactors (RBCs) arranged in 5 trains of 4 with aeration, 2 final clarifiers, a chlorine contact chamber with gas chlorination, and sodium bisulfite feed for dechlorination. Sludge is stabilized in a primary anaerobic digester with a fixed cover and a secondary digester with a floating cover. Sludge may be dried in the sludge drying bed or stored in a 1.2 million gallon storage tank prior to disposal by land application.

Design Capacity:
Average MGD: **3.300** Maximum MGD: **6.00**
Pounds BOD/Day: **4150** PE (BOD): **24,850**

Now Treating:
Average MGD: **1.45** Maximum MGD: **7.27**
Pounds BOD/Day: **3629** PE (BOD): **21,730**
Period Reviewed: **Jul. 2019 – Dec. 2020** Population Served: **8070 (2010 Census)**

Receiving Stream:
Outfall 001 - Unnamed tributary to Oxbow Lake, Tributary to the Boone River
Outfall 003 – Boone River

INSPECTION INFORMATION

Inspection:
Date and Time of Inspection: **03/10/21** Purpose: **Compliance Evaluation**
Date of Last Inspection: **07/16/19**

Persons Interviewed:
Name: **Tim Danielson** Title: **Wastewater Superintendent**

NPDES PERMIT COMPLIANCE SUMMARY

Self-Monitoring:
Operation Reports Submitted: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Required Data on Reports: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Testing Adequacy: ☒ Sat. ☐ Marg.* ☐ Unsat.*

Effluent Limitations:
Self-Monitoring Results: ☒ Compliance ☐ Infrequent Non-Compliance* ☐ Significant Non Compliance*

Samples this Inspection:
Type: **Influent & Effluent** Lab Data Attached? ☒ Yes ☐ No
Results: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Visual Appearance of Effluent: **Clear**
Visual Appearance of Receiving Stream: **Clear**

Compliance Schedule:
Compliance w/Schedule:
☐ Sat. ☐ Marg.* ☒ Unsat.* ☐ NA Next Items Due: **Delinquent progress report.**
Compliance schedule completed.

* Additional details in the narrative report

AUTHENTICATION

Inspector: Jeremy Klatt [signature] Date: 4/12/21
Reviewer: David Miller [signature] Date: 14 APRIL 21

Updated 10/22/2015 cmc DNR Form 542-3158

NPDES Permit #: 4063001

FACILITY EVALUATION

Were deficiencies noted or significant observations made during the inspection?

Yes = See Comments Section for details
No = No deficiencies or significant observations were noted
Lack of Entry = Item not applicable or not observed.

Item	Yes	No
1. Collection System		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Dry Weather Capacity	☐	☒
d. Infiltration/Inflow	☒	☐
e. Bypass(es)	☒	☐
2. Lift Station(s) (Collection System)		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/Emergency Operation	☐	☒
3. Industrial Waste Pre-Treatment		
a. Significant Industrial Users	☒	☐
b. Waste Toxicity/ Compatibility	☐	☒
c. Strength Reduction	☐	☒
d. Effect on Treatment Plant	☐	☒
4. Preliminary Treatment		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
5. Primary Treatment		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Sludge/Scum Removal	☐	☒
e. Effectiveness	☐	☒
6. Secondary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Recirculation	☐	☒
e. Freezing	☐	☒
f. Effectiveness	☐	☒
7. Final Settling		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
8. Supplementary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒

Item	Yes	No
9. Sludge Handling and Disposal		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
e. Final Disposal, Solids	☐	☒
f. Final Disposal, Liquids	☒	☐
10. Lagoon Structures		
a. Maintenance	☐	☐
b. Physical Condition	☐	☐
c. Capacity	☐	☐
d. Cell Configuration	☐	☐
e. Storage/Drawdown Management	☐	☐
11. Flow Measurement		
a. Operation and Maintenance	☒	☐
b. Capacity	☐	☒
c. Continuity	☐	☒
d. Location, Method/ Effectiveness	☐	☒
12. Pumping		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/ Emergency Operation	☐	☒
13. Miscellaneous		
a. Location	☐	☒
b. Odors	☐	☒
c. Emergency Operation	☐	☒
d. Bypass(es)	☐	☒
e. Equipment	☐	☒
f. Buildings & Grounds	☐	☒
g. Lab Certification	☒	☐
h. Other	☐	☐
14. Staffing, Operator Certification		
a. Operator, Direct Responsibility	☐	☒
b. Shift Operator(s)	☐	☒
c. General Staffing	☐	☒
15. Supplementary		
a. Permit Availability	☐	☒
b. Operation Reports Availability	☐	☒
c. Equipment Records Maintenance	☐	☒
d. Previously Noted Deficiencies	☐	☒
e. Improvements	☐	☒
f. Domestic/Industrial Growth	☐	☒
g. Recommendations	☒	☐
h. Required Actions	☒	☐

Facility Name: Webster City Wastewater Treatment Facility

NPDES Permit #: 4063001 Inspection Date: 07/16/19

INTRODUCTION

A compliance inspection was conducted at the Webster City WWTP on March 10, 2021. The inspection involved a review of City records, discussions with the operator identified above, and a walk through of the treatment plant. The purpose of the inspection was to determine the compliance status of the facility.

NPDES PERMIT COMPLIANCE SUMMARY

Discharge from this facility is authorized by NPDES permit #4063001. The NPDES permit was issued on March 1, 2016, and expired on February 28, 2021. An application for permit renewal was received on August 27, 2020, therefore, the City should continue to operate under the conditions of the expired permit until the new permit is issued.

Self-Monitoring Results

Monitoring reports for the period of July 2019 to December 2020 were reviewed for compliance with the permit. Effluent violations on the report in August 2019 (E. coli), October 2019 (ammonia) and November 2020 (pH and CBOD) were found to be data entry errors. Mr. Danielson resubmitted the reports to correct errors. After correcting for the reporting errors, no effluent violations occurred during the reviewed period.

Standard Conditions #13 & #14

Please note that permit conditions 13 and 14 require that effluent violations be reported either verbally (condition #13) or in writing at the time of MOR submittal (condition #14). The four effluent violations above were not reported at the time of the report submittal as required

Toxicity Testing

Toxicity testing was completed in October of 2019 and October of 2020; the effluent passed the test in both years. Please note that your permit requires submittal of the toxicity test results (DNR Form 542-1381) with the monthly operation report.

Compliance Sample

Influent and effluent samples were taken by Travis Morarend with the State Hygienic Laboratory during the inspection and the results are summarized below:

Table 1. Sampling Results from Inspection

	Influent		Effluent	
	mg/L	lbs/day	mg/L	lbs/day
BOD	310	3152	-	-
CBOD	-	-	17	192
TSS	140	1423	15	170
TKN	34	346	11	124
Ammonia	-	-	6.8	77
Nitrate	0.57	5.8	7.5	85
Total Nitrogen	34.6	351	18.9	213
Zinc	-	-	0.03	0.34
Cadmium	-	-	<0.00025	<0.0028
Silver	-	-	<0.001	<0.011
Copper	-	-	0.009	0.0102
Total P	9.9	101	9.4	106
DO	-	-	7.3	-

\- Not sampled

Compliance Schedule

The NPDES permit for Webster City contains a compliance schedule to meet more stringent effluent limits for cadmium, copper, silver, zinc and total residual chlorine. This schedule called for submittal of a progress report on June 1, 2020, and compliance with final limits on February 1, 2021. This progress report had not been received at the time of the inspection, but was received following the inspection on March 16, 2021. The progress report indicates that City is currently meeting the more stringent metals limits. Review of the compliance data submitted for the reviewed period confirmed that the City is meeting the new, more stringent metal limits.

The report also indicated that the City does not have the capability to measure TRC concentrations low enough to demonstrate compliance with the new TRC limit. During the inspection Mr. Danielson confirmed that the City has not yet purchased the new equipment. The City was not disinfecting on the day of the inspection but would need to begin disinfection on March 15. Without the ability to demonstrate compliance with the new limit, the City will be in violation of the permit limit.

Nutrient Reduction Strategy Construction Schedule

The construction schedule for nutrient reduction requires annual progress reports on March 1 of each year. The 2021 report had not been received at the time of the inspection, but was received following the inspection on March 16, 2021. The report indicates the City is in the planning process for construction of a new facility that will be designed with biological nutrient removal with supplemental chemical phosphorus removal. During the inspection, Mr. Danielson indicated that construction of the new plant will likely begin in two years.

FACILITY EVALUATION

Items 1d & e. COLLECTION SYSTEM – Infiltration/Inflow & Bypassing

No bypassing was reported during the reviewed period. However, the City should continue to budget funds for infiltration and inflow (I/I) as the collection system will continue to deteriorate over time.

Item 2a. LIFT STATION
There are three lift stations in town to pump all wastewater to the treatment plant. Mr. Danielson reported that the two primary lift stations (East & North) had their pumps rebuilt during the reviewed period. Furthermore, Mr. Danielson reported that the East lift station may be replaced as part of the facility upgrade project.

3a. SIGNIFICANT INDUSTRIAL USERS (SIUs)
The City's permit currently includes three significant industrial users; Mary Ann's Specialty Foods, Webster City Custom Meats, and Mertz Engineering. Mary Ann's Specialty Foods was inspected in November of 2020 and received a Letter of Noncompliance due to violations of their treatment agreement following the inspection. Webster City Custom Foods was last inspected in February of 2020 and received a Notice of Violation for treatment agreement violations. Review of the Webster City Custom Foods monitoring since February 2020 show that the facility has substantially complied with it's pretreatment limits since that time, though BOD violations occurred in October and December of 2020.

Mertz Engineering, was added to the City's permit as a significant industrial user in July of 2020. Mr. Danielson reported that Mertz Engineering has been submitting monitoring data and a review of their data shows no pretreatment violations, though there have been instances of non-reporting.

Mr. Danielson reported that the City recently signed a treatment agreement with an industry that plans to raise shrimp and will discharge to the City sewer. This treatment agreement should be sent to the DNR Des Moines office for review and inclusion in the new permit.

Item 3a. SIGNIFICANT INDUSTRIAL USERS (SIUs)

the Webster City Custom Foods monitoring since February 2020 shows that the facility has substantially complied with its pretreatment limits since that time, though BOD violations occurred in October and December of 2020.

Mertz Engineering, was added to the City's permit as a significant industrial user in July of 2020. Mr. Danielson reported that Mertz Engineering has been submitting monitoring data and a review of their data shows no pretreatment violations, though there have been instances of non-reporting for some parameters.

Mr. Danielson reported that the City recently signed a treatment agreement with an industry that plans to raise shrimp and will discharge to the City sewer. This treatment agreement should be sent to the DNR Des Moines office for review and inclusion in the new permit.

Mr. Danielson reported that the City is also working to allow an egg breaking facility to discharge to the City. Discussions have been begun with DNR to see if the City has the available capacity needed to allow the discharge.

6a. SECONDARY TREATMENT – Operation and Maintenance

Mr. Danielson reported that the trickling filter had recently become frozen during cold weather in February. The arm was operational at the time of inspection but sustained damage to the center well which was allowing some water to discharge to the filter prior to entering the arm. Mr. Danielson said plans are being made to repair the damage.

8a. SUPPLEMENTARY TREATMENT – Operation and Maintenance
Disinfection was not occurring at the time of inspection; Mr. Danielson indicated that the City planned to begin on March 15, as required by the permit.

9f. SLUDGE HANDLING AND DISPOSAL
Sludge was land applied in December of 2019 and November of 2020. The required pollutant testing was completed in both years and results in both years were below both the pollutant concentrations and ceiling concentrations in Tables 1 and 3 of Iowa Administrative Code. According to the sludge records, vector reduction requirement is met by incorporation and the pathogen reduction requirements was met by fecal coliform testing in 2020 and by detention time in the anaerobic digester in 2019. It is not clear if the City's sludge handling procedures meet the anaerobic digestion standard as it is not the mean cell residence time of the digester is not known. Mr. Danielson reported that pathogen reduction will be met with fecal coliform testing going forward.

11a. FLOW MEASUREMENT
The influent and effluent flows at this facility are measured by Parshall Flumes with ultrasonic flow meters. The meters should be calibrated in accordance with the manufacturer's recommendations. Mr. Danielson stated that an outside company calibrates the meters each year. Documentation of such calibration activities must be kept in the facility records for a minimum of three years.

13g. LAB CERTIFICATION
Operational monitoring and compliance sample analysis for BOD_5, $CBOD_5$, TSS, SS, NH_3-N, TRC, pH, DO, and temperature is conducted at the certified in-house laboratory (Iowa Lab #314). Samples for NO_3-N, TKN, Total N, Total P, metals, toxicity, and *E. coli* are taken to the State Hygienic Laboratory in Ankeny (Iowa Lab #397) for analysis. Samples are hand-delivered to comply with the 6-hour maximum hold time for *E. coli*.

NPDES Permit #: 4063001 Inspection Date: 07/16/19

SUMMARY

Overall, the facility appears to be properly operated and maintained and no effluent violations were reported during the reviewed period. The City is in the process of planning facility upgrades.

REQUIREMENTS

1. Provide proper notification of any non-compliance issues per Rules 567 IAC 63.12(455B) and 63.15(455B).

2. Ensure that all future compliance schedule items are submitted in accordance with the specified schedules per Subrule 567 IAC 64.3(1).

3. Submit toxicity testing results with the monthly operation reports per Subrule 567 IAC 64.3(1).

RECOMMENDATIONS

- Budget funds annually for I/I work as the collection system will deteriorate with age.

THE UNIVERSITY OF IOWA | STATE HYGIENIC LABORATORY

ANALYTICAL REPORT

1-800-421-IOWA (4692)

Collection Location	Collector and Phone	Client Reference	Accession #
wwtp influent grab sample WEBSTER CITY, IA	morarend uhl0023 515/72-516.38	webster city csi	1620276
	Collected 2021-03-10 10:35	Received 2021-03-10 14:21	Project 03wqcsi

Report To		Sample Information
	JEREMY KLATT IDNR-FO 2 2300 15TH ST SW MASON CITY, IA 50401-5630	Sample Description: wastewater Sample Type: Non-Drinking Water Sample Source: Sample Note(s): 1

RESULTS OF ANALYSIS - FINAL REPORT

TEST	RESULT (No Units)	ANALYSIS NOTE(S)
Field pH, SM 4500 H+ B		
pH	**7.7**	

TEST	RESULT (degrees C)	ANALYSIS NOTE(S)
Field Temperature, SM 2550 B		
Field Temperature	**12.0**	

SAMPLE AND ANALYSIS NOTES

1. Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

ANALYSIS INFORMATION

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
1. Field pH, SM 4500 H+ B	2021-03-10 10:35 EJO	3201	2021-03-12 07:25 TM	
2. Field Temperature, SM 2550 B	2021-03-10 10:35 EJO	3201	2021-03-12 07:25 TM	

DESCRIPTION OF UNITS

No Units = No Units
degrees C = Degrees Celsius

SITE(S) PERFORMING TESTING

3201 STATE HYGIENIC LABORATORY ANKENY, IOWA LABORATORIES COMPLEX, 2220 S ANKENY BLVD, ANKENY, IA 50023; Phone 515/725-1600; Fax 515/725-1642; Michael D. Schueller, M.S., Associate Director; Wade K. Aldous, Ph.D. (D)ABMM, Associate Director; IOWA ENVIRONMENTAL LAB ID #397

The result(s) of this report relate only to the items analyzed. Where the laboratory has not been responsible for the sampling stage the results apply only to the sample as received. This report shall not be reproduced except in full without the written approval of the laboratory. If you have any questions, please call Client Services at 800/421-IOWA (4692) or 319/335-4500.

THE UNIVERSITY OF IOWA | STATE HYGIENIC LABORATORY

ANALYTICAL REPORT

1-800-421-IOWA (4692)

Collection Location	Collector and Phone	Client Reference	Accession #
wwtp effluent grab sample	morarend uhl0023 515/72-516.38	webster city csi	1620277
WEBSTER CITY, IA	Collected 2021-03-10 11:20	Received 2021-03-10 14:21	Project 03wqcsi

Report To

JEREMY KLATT
IDNR-FO 2

2300 15TH ST SW
MASON CITY, IA 50401-5630

Sample Description	wastewater
Sample Type	Non-Drinking Water
Sample Source	
Sample Note(s)	1

RESULTS OF ANALYSIS - FINAL REPORT

TEST	RESULT (mg/L)	QUANT LIMIT	ANALYSIS NOTE(S)
Field Dissolved Oxygen, ASTM D 888-09 C			
Dissolved Oxygen	7.3	0.1	

TEST	RESULT (No Units)	ANALYSIS NOTE(S)
Field pH, SM 4500 H+ B		
pH	7.6	

TEST	RESULT (degrees C)	ANALYSIS NOTE(S)
Field Temperature, SM 2550 B		
Field Temperature	12.8	

SAMPLE AND ANALYSIS NOTES

1. Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

ANALYSIS INFORMATION

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
1. Field Dissolved Oxygen, ASTM D 888-09 C	2021-03-10 11:20 EJO	3201	2021-03-12 07:26 TM	
2. Field pH, SM 4500 H+ B	2021-03-10 11:20 EJO	3201	2021-03-12 07:26 TM	
3. Field Temperature, SM 2550 B	2021-03-10 11:20 EJO	3201	2021-03-12 07:26 TM	

DESCRIPTION OF UNITS

mg/L = Milligrams per Liter
No Units = No Units
degrees C = Degrees Celsius

SITE(S) PERFORMING TESTING

3201 STATE HYGIENIC LABORATORY ANKENY, IOWA LABORATORIES COMPLEX, 2220 S ANKENY BLVD, ANKENY, IA 50023; Phone 515/725-1600; Fax 515/725-1642; Michael D. Schueller, M.S., Associate Director; Wade K. Aldous, Ph.D. (D)ABMM, Associate Director; IOWA ENVIRONMENTAL LAB ID #397

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THE UNIVERSITY OF IOWA | STATE HYGIENIC LABORATORY

ANALYTICAL REPORT

1-800-421-IOWA (4692)

Collection Location	Collector and Phone	Client Reference	Accession #
wwtp influent 24 hour composite	morarend uhl0023 515/72-516.38	webster city csi	1622155
WEBSTER CITY,	Collected: 2021-03-11 10:40	Received: 2021-03-11 13:39	Project: 03wqcsi

Report To

JEREMY KLATT
IDNR-FO 2

2300 15TH ST SW
MASON CITY, IA 50401-5630

Sample Description: wastewater

Sample Type: Non-Drinking Water

Sample Source:

Sample Note(s): 1

RESULTS OF ANALYSIS - FINAL REPORT

TEST	RESULT ([MGD])	QUANT LIMIT	ANALYSIS NOTE(S)
Field Flow Rate, ISCO 1989			
Flow Rate	1.219	0.001	

TEST	RESULT (mg/L)	QUANT LIMIT	MCL	ANALYSIS NOTE(S)
Nitrate as N, EPA 300.0				2
Nitrate nitrogen as N	0.57	0.1	10	
Nitrite as N, EPA 300.0				2
Nitrite nitrogen as N	<0.125	0.125	1.0	

TEST	RESULT (mg/L)	QUANT LIMIT	ANALYSIS NOTE(S)
Total Phosphorus as P, LAC 10-115-01-2B			
Total Phosphorus as P	9.9	0.1	
Total Kjeldahl Nitrogen as N, LAC 10-107-06-2M			
Total Kjeldahl Nitrogen as N	34	0.1	
BOD, 5 Day, SM 5210 B			
BOD, 5 Day	310	2	
Total Suspended Solids, USGS I-3765-85			
Total Suspended Solids	140	1	

SAMPLE AND ANALYSIS NOTES

1. Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

   Webster City WWTP Raw Influent 24 hour Time Composite. ISCO sampler was set to collect 150 mL every 20 minutes. ISCO sampler was iced and locked overnight. All samples collected equal in volume, and similar in appearance. All samples were composited.

2. The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

ANALYSIS INFORMATION

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
1. Field Flow Rate, ISCO 1989	2021-03-11 10:40 EJO	3201	2021-03-12 07:32 TM	
2. Nitrate as N, EPA 300.0	2021-03-11 18:24 MGB	3201	2021-03-12 15:12 DLS	
3. Nitrite as N, EPA 300.0	2021-03-11 18:24 MGB	3201	2021-03-12 15:12 DLS	
4. Total Phosphorus as P, LAC 10-115-01-2B	2021-03-23 10:39 SLS	3201	2021-03-24 11:28 MLS	

Collection Location	Collector	Client Reference	Accession #
wwtp influent 24 hour composite	morarend uhl0023	webster city csi	1622155

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
5. Total Kjeldahl Nitrogen as N, LAC 10-107-06-2M	2021-03-23 10:39 SLS	3201	2021-03-24 11:28 MLS	
6. BOD, 5 Day, SM 5210 B	2021-03-11 14:00 AMG	3201	2021-03-17 13:51 JAE	
7. Total Suspended Solids, USGS I-3765-85	2021-03-11 09:05 KAR	3201	2021-03-12 14:57 MLS	

DESCRIPTION OF UNITS

[MGD] = Million Gallons per Day
mg/L = Milligrams per Liter

SITE(S) PERFORMING TESTING

3201 STATE HYGIENIC LABORATORY ANKENY, IOWA LABORATORIES COMPLEX, 2220 S ANKENY BLVD, ANKENY, IA 50023; Phone 515/725-1600; Fax 515/725-1642; Michael D. Schueller, M.S., Associate Director; Wade K. Aldous, Ph.D. (D)ABMM, Associate Director; IOWA ENVIRONMENTAL LAB ID #397

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THE UNIVERSITY OF IOWA | STATE HYGIENIC LABORATORY

ANALYTICAL REPORT

1-800-421-IOWA (4692)

Collection Location	Collector and Phone	Client Reference	Accession #
wwtp effluent 24 hour composite	morarend uhl0023 515-725-1638	webster city csi	1622156
WEBSTER CITY,	Collected: 2021-03-11 11:12	Received: 2021-03-11 13:39	Project: 03wqcsi

Report To

JEREMY KLATT
IDNR-FO 2

2300 15TH ST SW
MASON CITY, IA 50401-5630

Sample Description: wastewater
Sample Type: Non-Drinking Water
Sample Source:
Sample Note(s): 1

RESULTS OF ANALYSIS - FINAL REPORT

TEST	RESULT ([MGD])	QUANT LIMIT	ANALYSIS NOTE(S)
Field Flow Rate, ISCO 1989			
Flow Rate	1.355	0.001	

TEST	RESULT (mg/L)	QUANT LIMIT	ANALYSIS NOTE(S)
Ammonia as N, LAC 10-107-06-1J			
Ammonia nitrogen as N	6.8	0.05	

TEST	RESULT (mg/L)	QUANT LIMIT	MCL	ANALYSIS NOTE(S)
Nitrate as N, EPA 300.0				2
Nitrate nitrogen as N	7.5	0.1	10	
Nitrite as N, EPA 300.0				2
Nitrite nitrogen as N	0.38	0.025	1.0	

TEST	RESULT (mg/L)	QUANT LIMIT	ANALYSIS NOTE(S)
Total Phosphorus as P, LAC 10-115-01-2B			
Total Phosphorus as P	9.4	0.1	
Total Kjeldahl Nitrogen as N, LAC 10-107-06-2M			
Total Kjeldahl Nitrogen as N	11	0.1	
BOD, Carbonaceous 5 Day, SM 5210 B			
CBOD, 5 Day	17	2	
Total Suspended Solids, USGS I-3765-85			
Total Suspended Solids	15	1	
Metals, EPA 200.8			
Cadmium	<0.00025	0.00025	
Copper	0.009	0.005	
Silver	<0.001	0.001	
Zinc	0.03	0.02	

SAMPLE AND ANALYSIS NOTES

1. Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

   Webster City WWTP Final Effluent 24 hour Time Composite. ISCO sampler was set to collect 150 mL every 20 minutes for 24 hours. ISCO sampler was iced, and locked overnight. All samples were collected equal in volume and similar in appearance. All samples were composited.

Collection Location	Collector	Client Reference	Accession #
wwtp effluent 24 hour composite	morarend uhl0023	webster city csi	1622156

2. The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

ANALYSIS INFORMATION

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
1. Field Flow Rate, ISCO 1989	2021-03-11 11:12 EJO	3201	2021-03-12 07:35 TM	
2. Ammonia as N, LAC 10-107-06-1J	2021-03-26 12:10 MLS	3201	2021-03-26 14:12 JAE	
3. Nitrate as N, EPA 300.0	2021-03-11 19:56 MGB	3201	2021-03-12 15:12 DLS	
4. Nitrite as N, EPA 300.0	2021-03-11 19:33 MGB	3201	2021-03-12 15:12 DLS	
5. Total Phosphorus as P, LAC 10-115-01-2B	2021-03-23 10:39 SLS	3201	2021-03-24 11:28 MLS	
6. Total Kjeldahl Nitrogen as N, LAC 10-107-06-2M	2021-03-25 09:07 SLS	3201	2021-03-25 15:11 JAE	
7. BOD, Carbonaceous 5 Day, SM 5210 B	2021-03-11 14:00 AMG	3201	2021-03-17 13:51 JAE	
8. Total Suspended Solids, USGS I-3765-85	2021-03-11 09:05 KAR	3201	2021-03-12 14:57 MLS	
9. Metals, EPA 200.8	2021-03-23 13:37 SGB	3201	2021-03-24 14:25 MRC	

DESCRIPTION OF UNITS

[MGD] = Million Gallons per Day
mg/L = Milligrams per Liter

SITE(S) PERFORMING TESTING

3201 STATE HYGIENIC LABORATORY ANKENY, IOWA LABORATORIES COMPLEX, 2220 S ANKENY BLVD, ANKENY, IA 50023; Phone 515/725-1600; Fax 515/725-1642; Michael D. Schueller, M.S., Associate Director; Wade K. Aldous, Ph.D. (D)ABMM, Associate Director; IOWA ENVIRONMENTAL LAB ID #397

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August 17, 2022

CHIP ABBOT
WEBSTER CITY CUSTOM MEATS
PO BOX 280
1611 E 2ND ST
WEBSTER CITY IA 50595

Subject: **Notice of Violation** - Exceedance of Treatment Agreement Limits
NPDES Permit #4063001IC6

Dear Mr. Abbott:

This office recently completed a 6-month compliance review of your wastewater treatment facility records for the period of January through June 2022. This letter is to advise you that during the months of January, February, March, and June the effluent from your wastewater treatment facility exceeded the established limitations in your National Pollutant Discharge Elimination System (NPDES) permit. A copy of the violations report is enclosed.

The discharge of untreated or partially treated wastes that exceed permit effluent limits is a violation of Subrule 567 IAC 64.3(1) of the Iowa Administrative Code, and is prohibited by Section 455B.186 of the Code of Iowa. Additionally, Paragraph 567 IAC 62.1(8)"f" prohibits discharges with a pH lower than 5.0 standard units. **Please respond to this office in writing within 15 days of receipt of this letter stating what actions you have taken, or will take, to prevent further violations.** If non-compliance persists, this matter could be referred to our Legal Services Bureau in Des Moines for consideration of enforcement action including monetary penalties.

If you feel this notice has been sent in error, need assistance in understanding the effluent limit requirements in your NPDES permit, or otherwise wish to discuss this matter please contact me at jacob.donaghy@dnr.iowa.gov or 641-424-4073.

Sincerely,

FIELD SERVICES AND COMPLIANCE BUREAU

Jacob Donaghy
Environmental Specialist

Enclosure: Effluent Limits Violations Report

c: DNR Records Center
Nick Knowles (via nknowles@webstercity.com)

Effluent Limit Violations 1/1/2022 - 6/30/2022

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		AVERAGE - MG/L		DAILY MAXIMUM - MG/L		DAILY MAXIMUM - STD UNITS		DAILY MINIMUM - STD UNITS	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
WEBSTER CITY CUSTOM MEATS INC									
Outfall: 001									
1/2022	O&G			125	144				
	PH					11	14		
2/2022	O&G	100	105.475	125	259				
3/2022	PH							6	4.34
6/2022	PH							6	3.68

August 17, 2022

PAM NETZEL
MARY ANN SPECIALTY FOODS
1511 EAST 2ND ST
WEBSTER CITY IA 50595

Subject: **Notice of Violation** - Exceedance of Treatment Agreement Limits
NPDES Permit #4063001IC2

Dear Ms. Netzel:

This office recently completed a 6-month compliance review of your wastewater treatment facility records for the period of January through June 2022. This letter is to advise you that during the months of January, February, March, April, May, and June the effluent from your wastewater treatment facility exceeded the established limitations in your National Pollutant Discharge Elimination System (NPDES) permit. A copy of the violations report is enclosed. Of particular importance are the exceedances of the BOD5 and O&G limits, which constitute Significant Non-Compliance for these parameters.

The discharge of untreated or partially treated wastes that exceed permit effluent limits is a violation of Subrule 567 IAC 64.3(1) of the Iowa Administrative Code, and is prohibited by Section 455B.186 of the Code of Iowa. **Please respond to this office in writing within 15 days of receipt of this letter stating what actions you have taken, or will take, to prevent further violations.** If non-compliance persists, this matter could be referred to our Legal Services Bureau in Des Moines for consideration of enforcement action including monetary penalties.

If you feel this notice has been sent in error, need assistance in understanding the effluent limit requirements in your NPDES permit, or otherwise wish to discuss this matter please contact me at jacob.donaghy@dnr.iowa.gov or 641-424-4073.

Sincerely,

FIELD SERVICES AND COMPLIANCE BUREAU

Jacob Donaghy
Environmental Specialist

Enclosure: Effluent Limits Violations Report

c: DNR Records Center
Nick Knowles (via nknowles@webstercity.com)

Effluent Limit Violations 1/1/2022 – 6/30/2022

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		AVERAGE - LBS/DAY		DAILY MAXIMUM - LBS/DAY		AVERAGE - MG/L		DAILY MAXIMUM - MG/L		DAILY MAXIMUM - MGD	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
MARY ANN'S SPECIALTY FOODS Outfall: 001											
1/2022	BOD5	300	928.71763	400	2793.08435						
	O&G					100	377	125	871		
2/2022	BOD5	300	313.084851								
	O&G					100	286.68	125	717		
3/2022	FLOW									0.11	0.349
	O&G							125	127		
4/2022	O&G							125	142		
5/2022	O&G							125	162		
6/2022	BOD5	300	600.430687	400	2715.18374						
	TKN	30	45.2980638	40	211.531757						
	O&G					100	172.46	125	524		
	TSS	150	448.835548	250	2131.10352						

Appendix I: Table 4.2A Opinion of Probable Cost Detail

TABLE 4.2A

Webster City Facility Plan Opinion of Probable Cost for WWTF Improvements

Item	Alternative No. 1 - UCT	Alternative No. 2 - MLE	Alternative No. 3 - Ox. Ditch
General Conditions (3-5% of Construction Subtotal)	$2,700,000	$2,700,000	$3,000,000
East Lift Station Renovation (TOTAL)	$610,000	$610,000	$610,000
Site Work	$100,000	$100,000	$100,000
Precast Valve Vault	$25,000	$25,000	$25,000
Control Panel Building	$150,000	$150,000	$150,000
Pumps	$60,000	$60,000	$60,000
Piping and valves	$25,000	$25,000	$25,000
Electrical & Controls	$250,000	$250,000	$250,000
Forcemain (TOTAL)	$3,680,000	$3,680,000	$3,680,000
Two 18" Forcemains Open Cut	$2,160,000	$2,160,000	$2,160,000
Directional Drill under Hwy 20 w/ HDPE Casing	$760,000	$760,000	$760,000
Jack & Auger under UP Railroad	$360,000	$360,000	$360,000
Air Release Valves, Manholes, Fittings, Bore Pits, Misc	$400,000	$400,000	$400,000
Wet Weather Storage Lagoon (TOTAL)	$900,000	$900,000	$900,000
Lagoon Earthwork	$350,000	$350,000	$350,000
Synthetic Liner	$300,000	$300,000	$300,000
Concrete Sump, Anchor Trench, Manhole, Piping, Access Drive	$250,000	$250,000	$250,000
Site Work (TOTAL)	$3,900,000	$3,900,000	$4,300,000
General Excavation and Backfill	$2,000,000	$2,000,000	$2,400,000
Dewatering	$100,000	$100,000	$100,000
Site Utilities	$200,000	$200,000	$200,000
Paving, walks, and curbs	$600,000	$600,000	$600,000
Site prep, seeding, landscaping	$300,000	$300,000	$300,000
Fencing and Gates	$200,000	$200,000	$200,000
Demolition of Existing Structures, Piping and Equipment	$500,000	$500,000	$500,000
Cast in Place Concrete (TOTAL)	$12,765,000	$12,565,000	$15,310,000
Raw Lift Station Addition at Existing Plant	$40,000	$40,000	$40,000
Pretreatment Building	$500,000	$450,000	$500,000
Anaerobic/Anoxic Basins (Two Trains)	$1,750,000	$1,750,000	$1,100,000
Aeration Basins (Two Trains)	$3,500,000	$3,500,000	$5,400,000
Rapid Mix & Clarifier Control Structure	$160,000	$160,000	$160,000
Clarifiers (3)	$1,400,000	$1,400,000	$1,800,000
Fermenter	$630,000	$0	$630,000
UV Building	$150,000	$150,000	$150,000
Reaeration Basin	$120,000	$120,000	$120,000
Operations Building	$1,390,000	$1,500,000	$1,600,000
WAS Holding Tank	$315,000	$315,000	$320,000
Aerobic Digesters (Two Units)	$930,000	$930,000	$980,000
Press Batch Tank	$180,000	$200,000	$210,000
Press Building	$140,000	$140,000	$140,000
Dewatered Sludge Storage Building	$1,450,000	$1,800,000	$2,050,000
Septage Receiving Station	$60,000	$60,000	$60,000
Generator Slab and Miscellanious Items	$50,000	$50,000	$50,000
Buildings - Precast Concrete (TOTAL)	$1,720,000	$1,785,000	$1,815,000
Raw Lift Station Addition at Existing Plant	$60,000	$60,000	$60,000
Pretreatment Building	$310,000	$310,000	$310,000
Operations Building	$805,000	$820,000	$850,000
UV Building	$145,000	$145,000	$145,000
Press Building	$400,000	$450,000	$450,000
Architectural (Roofs, Carpentry, Doors, Misc. Metal) (TOTAL)	$1,520,000	$1,540,000	$1,540,000
Roofing	$400,000	$420,000	$420,000
Carpentry, Doors, and Windows	$120,000	$120,000	$120,000
Miscellanious Metals	$800,000	$800,000	$800,000
Misc. Renovation Work at Existing Plant	$100,000	$100,000	$100,000
Furnishings and Lab Equipment	$100,000	$100,000	$100,000
Pre-Engineered Metal Building - Dewatered Sludge Storage	$465,000	$600,000	$700,000
Painting	$800,000	$800,000	$780,000
Equipment (TOTAL)	$7,260,000	$7,345,000	$7,390,000
Bar Screen and Washer/Compactor at Existing Wet Well	$410,000	$410,000	$410,000
Renovate Aerated Grit Chamber	$70,000	$70,000	$70,000
Raw Lift Pumps at Existing Dry Well	$630,000	$630,000	$630,000
Fine Screen and Washer/Compactor at Pretreatment Building	$250,000	$250,000	$250,000
Vortex Grit Removal System	$180,000	$180,000	$180,000
Wet Weather Lagoon Return Pumps	$50,000	$50,000	$50,000
Jet Mix Equipment	$650,000	$650,000	--
Aeration Equipment - In Basin	$440,000	$440,000	$1,280,000
Aeration Blowers	$500,000	$500,000	--
ALR & MLR Pumps	$160,000	$80,000	--
Rapid Mixer	$60,000	$60,000	$60,000
Clarifier Mechanisms (3)	$750,000	$825,000	$950,000
RAS/WAS/Scum Pumps	$240,000	$240,000	$300,000
Submersible Mixers	$80,000	$0	$80,000
UV Disinfection	$250,000	$250,000	$250,000
Coarse Bubble Mixing - WAS Holding, Digesters, Press Batch Tank	$160,000	$160,000	$200,000
Biosolids Process Blowers (4)	$450,000	$450,000	$500,000
Rotary Drum Thickener	$250,000	$250,000	$300,000
Biosolids Pumps	$180,000	$180,000	$220,000
Tank Covers (4)	$350,000	$370,000	$380,000
Sludge Press	$670,000	$750,000	$750,000
Dewatered Sludge Conveyors	$200,000	$220,000	$220,000
Plant Drain Pumps	$50,000	$50,000	$50,000
Chemical Feed Equipment	$100,000	$150,000	$150,000
Hoists and Cranes	$80,000	$80,000	$60,000
Misc. Small Equipment	$50,000	$50,000	$50,000
Equipment Installation	$1,460,000	$1,470,000	$1,480,000
Piping, Fittings and Installation	$7,500,000	$7,350,000	$7,000,000
Valves and Gates	$1,200,000	$1,150,000	$1,000,000
Outfall Piping and Protection	$250,000	$250,000	$250,000
Plumbing	$500,000	$700,000	$500,000
HVAC	$1,000,000	$1,100,000	$1,100,000
Electrical & Controls	$7,600,000	$7,500,000	$7,200,000
Construction Contract Allowances	$1,000,000	$1,000,000	$1,000,000
Subtotal	**$56,830,000**	**$56,945,000**	**$58,555,000**
Contingency (20%)	$11,366,000	$11,318,000	$11,700,000
Construction Subtotal	**$68,196,000**	**$68,263,000**	**$70,255,000**
Legal/Engineering/Financing/Administration (15%)	$10,230,000	$10,187,000	$10,600,000
TOTAL	**$78,426,000**	**$78,450,000**	**$80,855,000**

Appendix J: Detailed Process Design Summary

- UCT Process Design Summary
- UCT Process at AWW Flow and Load – Winter
- UCT Process at AWW Flow and Load - Summer
- UCT Process BioWin Effluent Summary at AWW Flow and Load - Winter
- MLE Process at AWW Flow and Load - Winter
- MLE Process at AWW Flow and Load - Summer
- MLE Process BioWin Effluent Summary at AWW Flow and Load - Winter
- Sanitaire Oxidation Ditch Process Summary
- Sanitaire Oxidation Ditch Process Description

DESCRIPTION	VALUE		GOOD DESIGN PRACTICE
INFLUENT DESIGN CRITERIA			
Design Year	2040		20 years
Flow			
Average Dry Weather (ADW) Flow	1.989	MGD	
Average Wet Weather (AWW) Flow	4.586	MGD	
Maximum Wet Weather (MWW) Flow	9.43	MGD	
Peak Hour Wet Weather (PHWW) Flow	11.78	MGD	
Mechanical Plant Design Flow Rate (Plant MWW)	5.089	MGD	
Nutrient Removal Design Flow Rate	2.54	MGD	
Carbonaceous Biochemical Oxygen Demand (CBOD) Mass			
AWW	7,446	lbs/day	
MWW	10,665	lbs/day	
Total Suspended Solids (TSS) Mass			
AWW	8,104	lbs/day	
MWW	12,845	lbs/day	
Total Kjeldahl Nitrogen (TKN) Mass			
AWW	845	lbs/day	
MWW	1,155	lbs/day	
Total Phosphorus (TP) Mass			
AWW	145	lbs/day	
MWW	334	lbs/day	
Alkalinity	134	mg/L as CaCO3	Supplemental alkalinity may be required.
EFFLUENT DESIGN CRITERIA			
Refer to Appendix G			
MAIN LIFT STATION			
Number of Units	4		
Type	Dry Pit Sub.	Non-Clog Centrifugal	
Firm Capacity (Largest Unit Out of Service)	11.78	MGD	
Firm Capacity (Largest Unit Out of Service)	8,180	GPM	
Capacity (Each, 2)	1,600 GPM	at 120' TDH	
Motor Size	85	HP	
Capacity (Each, 2)	5,000 GPM	at 120' TDH	
Motor Size	215	HP	
Drive	VFD	w/ Bypass Contactors	
FORCEMAIN			
Number of Units	2		
Size	18	in.	
Velocity at Design Flow			
ADW (1,385 GPM)	1.78 ft/s	One Pipe In Service	
AWW (3,185 GPM)	4.08 ft/s	One Pipe In Service	
MWW (6,550 GPM)	4.20 ft/s	Two Pipes In Service	
PHWW (8,185 GPM)	5.25 ft/s	Two Pipes In Service	
WET WEATHER EQUALIZATION LAGOON			
Number of Lagoons	1		
Operating Capacity	12.0	MG	
Bottom Dimensions	185 ft	x 420 ft	
Operating Depth	18	ft	
Freeboard	2.0	ft	2 ft minimum
Minimum Level	2.0	ft	2 ft minimum
Interior Side Slope	3:1	Run: Rise	3:1 to 4:1
Distance From Lagoon Bottom To Bedrock	10	ft	10 ft recommended, 4 ft minimum
Liner Material	Synthetic	HDPE	
EQ RETURN LIFT STATION			
Number of Units	2		
Type	Submersible	Non-Clog Centrifugal	
Firm Capacity (Largest Unit Out of Service)	0.50	MGD	
Capacity (Each)	350 GPM		
Motor Size	15	HP	
Drive	VFD		

DESCRIPTION	VALUE		GOOD DESIGN PRACTICE
ACTIVATED SLUDGE PROCESS			
Solids Retention Time (SRT) (Total)	20	Days	20 days or greater for extended aeration
Water Temperature			
Minimum	10	Degrees C	
Maximum	25	Degrees C	
NUTRIENT BASIN			
Nutrient Removal Process For Biological N and P Removal	University of	Cape Town (UCT) Process	
Number of Treatment Trains	2		
Anaerobic Basins			
Number of Units	2		
Type	Complete	Mix	
Dimensions (Each)	60 ft X	18 ft	
Volume (Each)	145,000	gal	
Operating Depth	18	ft	
Freeboard	3	ft	
SRT	1.8	Days	Greater than 1 - 1.5 days
HRT at AWW Flow	1.52	Hrs	
HRT at Nutrient Removal Flow	3.04	Hrs	1 - 2 hrs
Mixing System			
Type	Jet	Mix	
Number of Pumps and Mixing Headers per Tank	1		
Pump Type	Submersible Non	Clog Centrifugal	
Motor Size	20	HP	
Drive	VFD		
Anoxic Basins			
Number of Units	2 Trains	of 2 Basins in Series	
Type	Complete	Mix	
Operating Depth	17.25	ft	
Freeboard	3	ft	
SRT (Total Anoxic)	3.1	Days	Greater than 1 - 1.5 days
HRT at AWW Flow (Total Anoxic)	2.62	Hrs	
HRT at Nutrient Removal Flow (Total Anoxic)	5.23	Hrs	
Anoxic Basins 'A'			
Dimensions (Each)	60 ft X	10 ft	
Volume (Each)	75,000	gal	
Mixing System			
Type	Jet	Mix	
Number of Pumps and Mixing Headers per Tank	1		
Pump Type	Submersible Non	Clog Centrifugal	
Motor Size	7.5	HP	
Drive	VFD		
Anoxic Basins 'B'			
Dimensions (Each)	60 ft X	24 ft	
Volume (Each)	185,000	gal	
Mixing System			
Type	Jet	Mix	
Number of Pumps and Mixing Headers per Tank	1		
Pump Type	Submersible Non	Clog Centrifugal	
Motor Size	25	HP	
Drive	VFD		

DESCRIPTION	VALUE		GOOD DESIGN PRACTICE
ANOXIC LIQUOR RETURN PUMPS			
Number of Units	2		
Type	Submersible Non	Clog Centrifugal	
Return Rate (% of Nutrient Removal Design Flow)	200	%	200% of influent flow
Capacity (Each)	1,765 GPM	at 18' TDH	
Motor Size	20	HP	
Drive	VFD		
AERATION BASINS			
Number of Basin Trains	2		
Type	3 Stage	Baffled	
Dimensions per Basin			
First Stage	74 ft X 72 ft		
Second Stage	30 ft X 72 ft		
Third Stage	20 ft X 72 ft		
Operating Depth	16	ft	
Freeboard	4	ft	
Volume per Basin (Each)			
First Stage	638,000	gal	
Second Stage	259,000	gal	
Third Stage	172,000	gal	
SRT, Total Aeration Basin	15.0	days	15 - 20 days minimum
HRT at AWW Flow	6.94	hrs	
CBOD Volumetric Loading (Includes N Removal Carbon Deman	14.6	lbs/ 1,000 c.f.	Less than 15 lbs/ 1,000 c.f.
MLSS Concentration	3,672	mg/L	Less than 5,000 mg/L
Food/Microorganism Ratio	0.18	lbs CBOD/lb MLVSS/d	
Aeration and Mixing System			
Actual Oxygenation Rate (AOR), Total			
AWW	11,129	lbs/d	
MWW	15,804	lbs/d	
Peaking Factor (PF)	2.0		2.0 (per 10 States Standards)
Peak AOR (AWW)	22,258	lbs/d	
Maximum Air Flow Rate, Total (AWW x PF)	12,000	SCFM at 8.6 PSIG	
Oxygen Uptake Rate (AWW)	23.2	mg/L/hr	40 mg/L/hr maximum
Peak Oxygen Uptake Rate (AWW x PF)	46.4	mg/L/hr	60 mg/L/hr maximum
Dissolved Oxygen Concentration	2.0	mg/L	2 mg/L
First and Second Stages			
Type	Fine Bubble	Flexible Membrane	
Alpha (Dirty Water Coefficient)	0.45		
Beta (Dirty Water Saturation Correction)	0.95		
Third Stage			
Type	Jet Mix	Aeration	
Alpha (Dirty Water Coefficient)	0.85		
Beta (Dirty Water Saturation Correction)	0.95		
Pumps			
Number of Pumps and Mixing Headers (Each Basin)	1		
Pump Type	Submersible Non	Clog Centrifugal	
Motor Size	20	HP	
Drive	VFD		
AERATION BLOWERS			
Number of Units	6		
Firm Capacity (one unit out of service)	12,000	SCFM	
Type	Positive	Displacement	
Maximum Inlet Temperature	110	degrees F	
Minimum Inlet Temperature	(-) 20	degrees F	
Capacity at Max. Inlet Temperature	2,400	SCFM	
Net Discharge Pressure	8.6	PSIG	
Motor Size	150	HP	
Drive	VFD		
Number of Blowers Operating			
AWW	2 - 3		
MWW	3 - 4		
AWW x SF	5		

DESCRIPTION	VALUE		GOOD DESIGN PRACTICE
MIXED LIQUOR RETURN PUMP			
Number of Units	2		
Type	Submersible Non	Clog Centrifugal	
Return Rate (% of Nutrient Removal Design Flow)	200	%	200-300% of influent flow
Capacity (Each)	1,765	at 44' TDH	
Motor Size	20	HP	
Drive	VFD		
RAPID MIX BASIN			
Number of Units	1		
Dimensions	12 ft X	12 ft	
Operating Depth	16	ft	
Operating Volume	17,230	gallons	
HRT at AWW + 100% RAS (6,375 GPM)	2.7	min	
HRT at Nutrient Removal Flow + 100% RAS (3,190 GPM)	5.4	min	
Mixer Type	Top Entering	Vertical Shaft	
Minimum Mean Velocity Gradient, G	400	1/s	300 - 500 (1/s)
Motor Size	30.0	HP	
Drive	VFD		
CLARIFIER			
Number of Units	3		
Type	Circular		
Sludge Collection and Withdrawal	Rapid	Hydraulic	
Diameter	68	ft	
Side Water Depth	14	ft	
Surface Area (Each)	3,632	sf	
Operating Volume	380,300	gal	
Launder	Inboard w/	Peripheral Weir	
Weir Length	213	ft	
Motor Size	3/4	HP	
Drive	Constant	Speed	
All Units Online - AWW Flow			
Weir Loading Rate	7,177	gal/d/ft	
Hydraulic Loading Rate	421	gal/sf/d	Less than 1,000 gal/sf/d
Solids Loading Rate (100% RAS)	26.3	lb/d/sf	Less than 30 lbs/sf/d
One Unit Offline - Treat 75% AWW Flow			
Weir Loading Rate	8,074	gal/d/ft	
Hydraulic Loading Rate	473	gal/sf/d	Less than 1,000 gal/sf/d
Solids Loading Rate (0.75 x 100% RAS)	29.6	lb/d/sf	Less than 30 lbs/sf/d
RETURN ACTIVATED SLUDGE (RAS) PUMPS			
Number of Units	4		
Type	Horizontal Non	Clog Centrifugal	
Return Rate (% of Influent AWW Flow)	50 - 100	%	80 - 100% of influent flow
Capacity (Each)	1,065 GPM		
Motor Size	20	HP	
Drive	VFD		
WASTE ACTIVATED SLUDGE (WAS) & SCUM PUMP			
Number of Units	2		
Type	Horizontal Non	Clog Centrifugal	
Capacity (Each)	200 GPM		
Motor Size	15	HP	
Drive	VFD		

DESCRIPTION	VALUE			GOOD DESIGN PRACTICE
FERMENTER				
Number of Units	1			
Dimensions	65 ft	Dia.		
Operating Depth	19	ft		
Operating Volume	460,000	gallons		
HRT at AWW	24	hr	24 - 48 hrs	
HRT at Nutrient Removal Flowrate	43	hr		
Raw Waste Fraction at AWW				
Percent Flow	5%			
Flowrate	80	GPM		
RAS Fraction at AWW 100% RAS				
Percent Flow	15%			
Flowrate	240	GPM		
Mixing System	Submersible	Mixers		
ULTRAVIOLET (UV) DISSINFECTION				
Number of Units	1 Duty +	1 Standby		
Type	Angled	Submerged Bulbs		
Capacity (Each)	4.586	MGD		
Total Capacity	5.086	MGD		
Transmissivity	65	%		
UV Dose	30	mJ/cm^2		
REAERATION BASIN				
Number of Basin Trains	1			
Type	2 Stage	Baffled		
Dimensions (Each Stage)	20 ft X 10 ft			
Operating Depth	11	ft		
Freeboard	2	ft		
Volume (Each Stage)	16,450	gal		
Volume (Total)	32,900	gal		
HRT at AWW Flow	10.3	min		
Aeration System				
Type	Fine Bubble	Flexible Membrane		
Actual Oxygenation Rate (AOR) (Total)	200	lbs/d		
Oxygen Uptake Rate	30.3	mg/L/hr	40 mg/L/hr	
Dissolved Oxygen Concentration	5.0	mg/L		
Alpha (Dirty Water Coefficient)	0.45			
Beta (Dirty Water Saturation Correction)	0.95			

DESCRIPTION	VALUE		GOOD DESIGN PRACTICE
BIOSOLIDS PRODUCTION ESTIMATE			
Total WAS Production at AWW (Winter Condition)	4,921	lbs/d	
TSS Generation	2,026	lbs/d	
VSS Generation	2,895	lbs/d	
WAS Concentration	0.66%		
Daily WAS Volume	88,730	gal/d	
WAS HOLDING TANK			
Number of Units	1		
Type	Concrete	w/ Sump	
Diameter	46	ft	
Operating Depth	22	ft	
Free Board	2	ft	
Operating Volume	266,000	gal	
Storage Time at 0.66 % Solids	3	days	
Mixing System			
Type	Coarse Bubble	Aeration	
Design Airflow	30 SCFM	per 1,000 cf	30 - 40 SCFM per 1,000 cf
Airflow Required	1,070 SCFM	at 11.0 PSIG	
WAS HOLDING TANK BLOWER			
Number of Units	1		
Type	Positive	Displacement	
Capacity	1,070	SCFM	
Net Discharge Pressure	11.0	PSIG	
Inlet Temperature			
Minimum	(-) 20	degrees F	
Maximum	110	degrees F	
Motor Size	75	HP	
Drive	VFD		
SLUDGE THICKENER			
Number of Units	1		
Type	Rotary	Drum	
Capacity	300 GPM	at 0.66% Solids	
Design Runtime	35	hrs/wk	
Target Thickened Solids Concentration	4.5	%	
Gallons of Thickened Sludge Per Day	13,112	gal/d	
AEROBIC DIGESTERS (EXISTING)			
Number of Units	2		
Type	Cast-In-Place	Concrete w/ Sloped Floor	
Diameter	56	ft	
Operating Depth	22	ft	
Free Board	2	ft	
Operating Volume (Each)	405,000	gal	
Storage Time at 4.5 % Solids, Total	61	days	60 days at 15 degrees C.
VSS Destruction Rate	40%		
Net Solids Discharged From Digester	3,760	lbs/d	
Mixing System			
Type	Coarse Bubble	Aeration	
Material	Stainless	Steel	
Design Airflow	30 SCFM	per 1,000 cf	30 - 40 SCFM per 1,000 cf
Airflow Required	1,625	at 11.0 PSIG	

DESCRIPTION	VALUE		GOOD DESIGN PRACTICE
AEROBIC DIGESTER BLOWERS			
Number of Units	3		
Type	Positive	Displacement	
Capacity, Each	1,625	SCFM	
Net Discharge Pressure	11.0	PSIG	
Inlet Temperature			
Minimum	(-) 20	degrees F	
Maximum	110	degrees F	
Motor Size	150	HP	
Drive	VFD		
PRESS HOLDING TANK			
Number of Units	1		
Type	Concrete	w/ Sump	
Diameter	28	ft	
Operating Depth	18	ft	
Free Board	2	ft	
Operating Volume	80,000	gal	
Storage Time at 3.4 % Solids	3	days	
Mixing System			
Type	Coarse Bubble	Aeration	
Design Airflow	20 SCFM	per 1,000 cf	20 - 40 SCFM per 1,000 cf
Airflow Required	212 SCFM	at 11.0 PSIG	
PRESS HOLDING TANK BLOWER			
Number of Units	1		
Type	Positive	Displacement	
Capacity	212	SCFM	
Net Discharge Pressure	9.3	PSIG	
Inlet Temperature			
Minimum	(-) 20	degrees F	
Maximum	110	degrees F	
Motor Size	25	HP	
Drive	VFD		
BIOSOLIDS DEWATERING			
Number of Units	1		
Type	Screw	Press	
Weekly Digested Biosolids Production (Winter Basis)	13	Dry Ton/wk	
Press Operation Time	35	Hrs/wk	
Capacity	755	Dry lbs/hr	
Feed rate	44	GPM at 3.4% Solids	
Dewatered Cake Solids Content	20%		
DEWATERED BIOSOLIDS STORAGE			
Type	Covered	Concrete Bunker	
Storage Time	365	Days	365 days (one year)
Annual Digested Biosolids Production (Winter Basis)	686	Dry Ton/yr	
Dewatered Cake Solids Content	20%		
Annual Dewatered Cake Production	3,431	Wet Ton/yr	
Dewatered Cake Density	40	lbs/cf	40 - 60 lbs/cf
Dewatered Cake Volume	172,000	cf	
Stacking Height	10	ft	
Storage Area Required	17,155	sf	
Bunker Dimensions	110 ft x 205 ft		

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Winter AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
UCT Process Design

Line	Parameter	Value	Units	Notes
1	**INPUT DATA**			
2				
3	**Aerobic Process Loading**			
4				
5	Flowrate	4.59	MGD	Manual input
5A	CBOD5 mass to secondary process	7,446	lbs.CBOD/d	Manual input
5B	CBOD mass removed with denitrification	1,208	lbs.CBOD/d	Manual input
6	CBOD5 mass to aeration basins	6,238	lbs/d	Line 5A - Line 5B
7	TKN mass	845	lbs/d	Manual input
7A	P Mass	145	lbs/d	Manual input
8	Alkalinity concentration	134	mg/L CaCO3	Manual input, Based on City Sampling applied to ADW flow
9	Fixed TSS, % of total TSS	25%	of TSS	Manual input
10	Inert VSS, % of total TSS	10%	of TSS	Manual input
10A				
11	TSS mass	8,104	lbs/d	Manual input
12				
13	**Process Design Parameters**			
14				
15				
16	SRT (including anaerobic, anoxic, and aeration basins)	20	days	Manual input
17	Temperature	10	degrees C	Manual input
18	MLSS concentration (max)	5000	mg/L	Manual input
19	Oxygen Uptake Rate (max)	40	mg/L/hr	Manual input
20	Clarifier hydraulic load (max)	500	gpd/sf	Manual input
21	Number of aeration basins	1		Manual input
22	Number of clarifiers	3		Manual input
23	RAS ratio	125%		Manual input
24	Clarifier solids load (max)	30	lbs/d/sf	Manual input
25	a, Yield factor	0.4	lbs. VSS/lb. CBODL removed	Manual input
26	b, Endogenous decay factor at 20 deg C	0.2	lbs VSS destroyed/lb VSS/d	Manual input
27	Ratio CBODL:CBOD5	1.5		Manual input
28	e, CBOD removal efficiency	100%		Manual input
28A	P solids production chem P removal	0.0	lbs solids / lb P removed	Manual input
29	Min aeration HRT	0	hrs	Manual input Not applicable
30	Aeration Basin Depth	16	ft	Manual input
31				

Line	Parameter	Value	Units	Notes
32	Aeration air requirement, O2 transfer	0.5	scfm/lb O2 per day transfer	Manual input
33	Aeration air requirement, mixing	0.14	scfm/sq ft basin	Manual input
34	Blower power	0.7	bhp-hr/lb O2	Manual input
35	Number of blowers (operating)	3		Manual input
36	Thickened sludge concentration	4.5%		Manual input
37				
38				
39				
40				
41	**AERATION BASINS**			
42				
43				
44	b, decay factor at operating temp.	0.1	lbs VSS destroyed/lb VSS/d	Line 26 + 0.01(T - 20)
45	L, CBODL Loading to aeration basins	9,357	lbs/d	Line 6 * Line 27
46	L, CBODL Loading to activated sludge process	11,169	lbs/d	Line 5A * Line 27
47	Sludge Production Rate			
48	MLVSS Production	2,085	lbs/d	dM/dt = aeL[1-0.8bSRT/(1+bSRT) [Line 46 CBOD load]
49	Inert VSS Production	810	lbs/d	Line 10*Line 11
49A	Chem P Removal Solids Production	0	lbs/d	Line 7A * Line 28A
50	Fixed MLSS Production	2,026	lbs/d	Line 9 * Line 11
51	**Total MLSS Production**	**4,921**	**lbs/d**	
52	MLVSS/MLSS	59%		
53	MLSS Inventory	98,426	lbs	SRT * Line 51
54				
55	Aeration Requirement			
56	BODL	9,357	lbs O2/d	dO/dt=eL [Line 6 CBOD load]
57	TKN oxidation	3,887	lbs O2/d	dO/dt = 4.6 * TKN
58	WAS oxygen equivalent	(2,961)	lbs O2/d	dO/dt = 1.42 * dM/dt
59	Total AOR required	10,283	lbs O2/d	
59A	Actual AOR provided		lbs O2/d	Manual input
60				
61	Aeration Volume Required			
62	MLSS Limit	2.36	MG	MLSS Inventory/(MLSS limit * 8.34)
63	OUR Limit	1.28	MG	(AOR/24)/(OUR limit * 8.34)
64	HRT Limit	0.00	MG	(Q/24) * Min HRT
65	**Aeration Design Volume Required**	**2.36**	**MG**	Max of the three volumes above
65A	**Actual aeration basin volume provided**	**2.40**	**MG**	Manual input
66	**Actual anoxic basin volume provided**	**0.5**	**MG**	Manual input

Line	Parameter	Value	Units	Notes
66A	**Actual anaerobic basin volume provided**	**0.29**	**MG**	Manual input
67	**Total anoxic ana + aeration basin volume provided**	**3.19**	**MG**	Line 65A + Line 66 + Line 66A BASED ON 20d SRT Ana+Anox+Aer
68				
69				
70				
71				
72				
73				
74				
75	MLSS Concentration	3,700	mg/L	MLSS Inventory/(Aer + Anox Vol)/8.34 [Line 53/Line67/8.34]
76	OUR	21.4	mg/L/hr	AOR/24/Aeration Vol/8.34
77	F:M ratio	0.18	lbs CBOD5/lb MLVSS/d	CBOD5/(MLVSS Prod * SRT) based on anox. + aer.
78	CBOD Volumetric Loading	14.6	lbs CBOD5/1000 cf/d	CBOD5*1000/(Aeration Vol/7.48) based on ana. + anox. + aer.
79	HRT (aeration basin only)	12.5	hrs.	Aeration vol./influent flowrate
80				
81	**BLOWERS**			
82				
83	Number of Blowers (Operating)	3		Line 35
84	Oxygen transfer required	10,283	lbs O2/d	Line 59
85	Air Requirement			
86	O2 transfer	5,142	scfm	AOR * Line 32
87	Mixing requirement	2,761	scfm	Line 33 * (aeration volume/depth)
88	Aeration air requirement	5,142	scfm	Max of the two values above
89	**Blower Capacity (each) required**	**1,714**	**scfm**	Total air reqd/no of blowers
89A	**Actual blower capacity provided (each)**		**scfm**	Manual input
90	**Blower bhp (each) required**	**100**	**bhp**	(AOR/24)*Line 34/Line 83
90A	**Actual blower motor horsepower (each)**		**hp**	Manual input

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Winter AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
UCT Process Design

Line	Parameter	Value	Units	Notes
102	**SLUDGE PRODUCTION**			
103				
104	Daily solids production	4,921	lbs/d	Line 51
105	Thickened sludge concentration	4.5%		Line 36
106	Approximate WAS concentration	6,659	mg/L	MLSS*(1+RAS ratio)/RAS ratio
107	**Volume WAS per day**	**88,611**	**gal/d**	1000000*WAS lbs/(WAS conc. *8.34)
108	**Volume thickened sludge per day**	**13,113**	**gal/d**	WAS lbs/(thickened conc. * 8.34)
109				
110	**ALKALINITY**			
111				
112	Raw alkalinity concentration	134	mg/L CaCO3	Line 8
113	Alkalinity residual goal	(100)	mg/L CaCO3	Manual input
114	Alkalinty available	34	mg/L CaCO3	
115	Raw alkalinity mass available	1,302	lbs/d CaCO3	Q*alkalinity available*8.34
115A	Alkalinity mass recovered with denitrification	2,282	lbs/d CaCO3	Manual input
116	Alkalinity consumed	(6,000)	lbs/d CaCO3	TKN mass * 7.1
117	Alkalinity Deficiency (excess)	2,416	lbs/d CaCO3	
118	Hydrated lime requirement	0.89	tons/d	alk reqd/1.35/2000
119	Magnesium Hydroxide slurry requirement			
120	Alkalinity equivalent	1.71	lbs. CaCO3/lb. Mg(OH)2	Manual input
121	Slurry concentration	61%		Manual input
122	**Magnesium Hydroxide slurry requirement**	**2,316**	**Lbs/d**	alk reqd/Line 120/Line 121

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Summer AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
UCT Process Design

Line	Parameter	Value	Units	Notes
102	**SLUDGE PRODUCTION**			
103				
104	Daily solids production	4,326	lbs/d	Line 51
105	Thickened sludge concentration	4.5%		Line 36
106	Approximate WAS concentration	5,853	mg/L	MLSS*(1+RAS ratio)/RAS ratio
107	**Volume WAS per day**	**88,611**	**gal/d**	1000000*WAS lbs/(WAS conc. *8.34)
108	**Volume thickened sludge per day**	**11,526**	**gal/d**	WAS lbs/(thickened conc. * 8.34)
109				
110	**ALKALINITY**			
111				
112	Raw alkalinity concentration	134	mg/L CaCO3	Line 8
113	Alkalinity residual goal	(100)	mg/L CaCO3	Manual input
114	Alkalinty available	34	mg/L CaCO3	
115	Raw alkalinity mass available	1,302	lbs/d CaCO3	Q*alkalinity available*8.34
115A	Alkalinity mass recovered with denitrification	2,282	lbs/d CaCO3	Manual input
116	Alkalinity consumed	(6,000)	lbs/d CaCO3	TKN mass * 7.1
117	Alkalinity Deficiency (excess)	2,416	lbs/d CaCO3	
118	Hydrated lime requirement	0.89	tons/d	alk reqd/1.35/2000
119	Magnesium Hydroxide slurry requirement			
120	Alkalinity equivalent	1.71	lbs. CaCO3/lb. Mg(OH)2	Manual input
121	Slurry concentration	61%		Manual input
122	**Magnesium Hydroxide slurry requirement**	**2,316**	**Lbs/d**	alk reqd/Line 120/Line 121

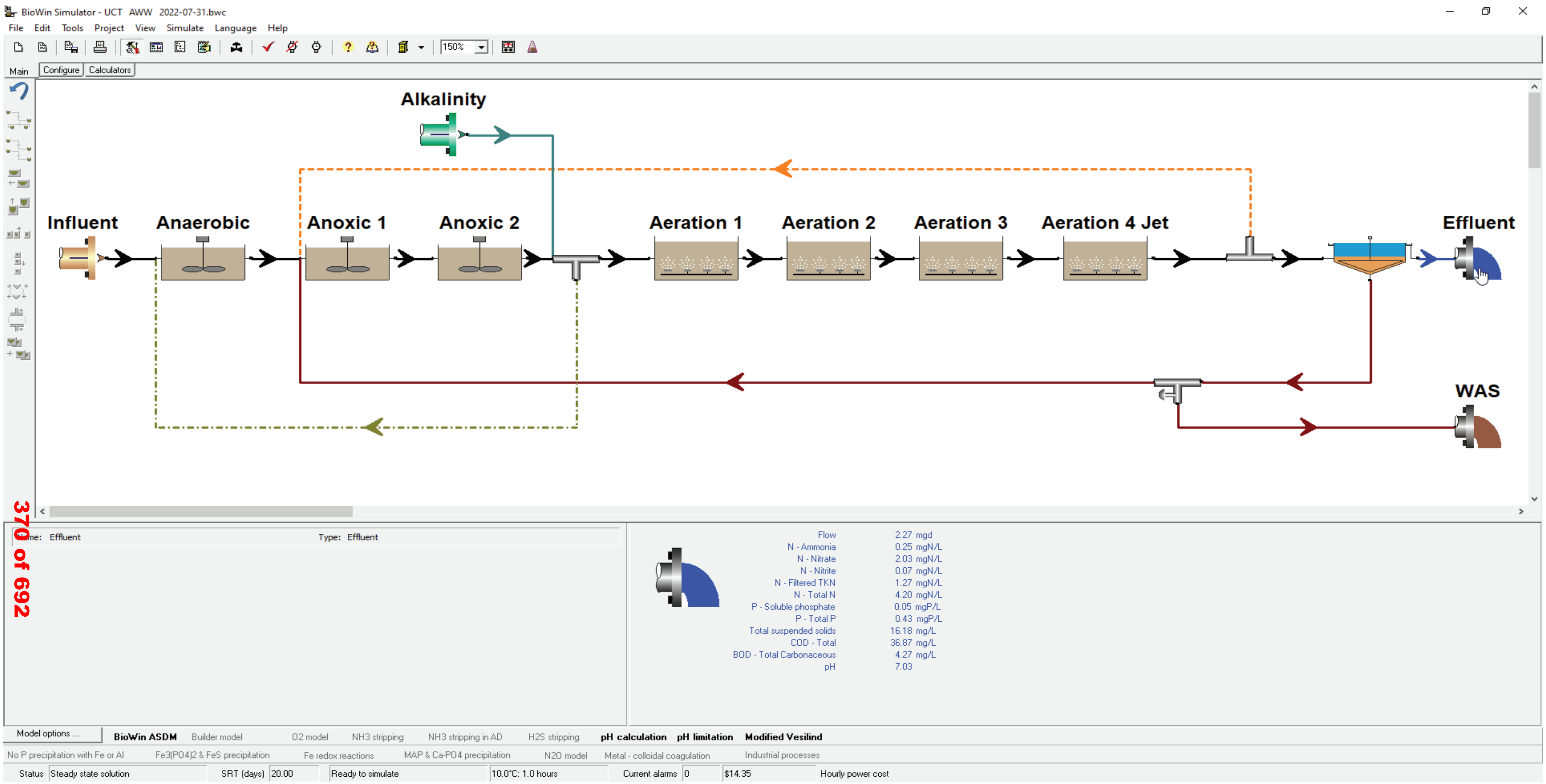
Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Summer AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
UCT Process Design

Line	Parameter	Value	Units	Notes
1	**INPUT DATA**			
2				
3	**Aerobic Process Loading**			
4				
5	Flowrate	4.59	MGD	Manual input
5A	CBOD5 mass to secondary process	7,446	lbs.CBOD/d	Manual input
5B	CBOD mass removed with denitrification	1,208	lbs.CBOD/d	Manual input
6	CBOD5 mass to aeration basins	6,238	lbs/d	Line 5A - Line 5B
7	TKN mass	845	lbs/d	Manual input
7A	P Mass	145	lbs/d	Manual input
8	Alkalinity concentration	134	mg/L CaCO3	Manual input, Based on City Sampling applied to ADW flow
9	Fixed TSS, % of total TSS	25%	of TSS	Manual input
10	Inert VSS, % of total TSS	10%	of TSS	Manual input
10A				
11	TSS mass	8,104	lbs/d	Manual input
12				
13	**Process Design Parameters**			
14				
15				
16	SRT (including anaerobic, anoxic, and aeration basins)	20	days	Manual input
17	Temperature	25	degrees C	Manual input
18	MLSS concentration (max)	5000	mg/L	Manual input
19	Oxygen Uptake Rate (max)	40	mg/L/hr	Manual input
20	Clarifier hydraulic load (max)	500	gpd/sf	Manual input
21	Number of aeration basins	1		Manual input
22	Number of clarifiers	2		Manual input
23	RAS ratio	125%		Manual input
24	Clarifier solids load (max)	35	lbs/d/sf	Manual input
25	a, Yield factor	0.4	lbs. VSS/lb. CBODL removed	Manual input
26	b, Endogenous decay factor at 20 deg C	0.2	lbs VSS destroyed/lb VSS/d	Manual input
27	Ratio CBODL:CBOD5	1.5		Manual input
28	e, CBOD removal efficiency	100%		Manual input
28A	P solids production chem P removal	0.0	lbs solids / lb P removed	Manual input
29	Min aeration HRT	0	hrs	Manual input Not applicable
30	Aeration Basin Depth	16	ft	Manual input
31				

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Summer AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
UCT Process Design

Line	Parameter	Value	Units	Notes
32	Aeration air requirement, O2 transfer	0.5	scfm/lb O2 per day transfer	Manual input
33	Aeration air requirement, mixing	0.14	scfm/sq ft basin	Manual input
34	Blower power	0.7	bhp-hr/lb O2	Manual input
35	Number of blowers (operating)	3		Manual input
36	Thickened sludge concentration	4.5%		Manual input
37				
38				
39				
40				
41	**AERATION BASINS**			
42				
43				
44	b, decay factor at operating temp.	0.25	lbs VSS destroyed/lb VSS/d	Line 26 + 0.01(T - 20)
45	L, CBODL Loading to aeration basins	9,357	lbs/d	Line 6 * Line 27
46	L, CBODL Loading to activated sludge process	11,169	lbs/d	Line 5A * Line 27
47	Sludge Production Rate			
48	MLVSS Production	1,489	lbs/d	dM/dt = aeL[1-0.8bSRT/(1+bSRT) [Line 46 CBOD load]
49	Inert VSS Production	810	lbs/d	Line 10*Line 11
49A	Chem P Removal Solids Production	0	lbs/d	Line 7A * Line 28A
50	Fixed MLSS Production	2,026	lbs/d	Line 9 * Line 11
51	**Total MLSS Production**	**4,326**	**lbs/d**	
52	MLVSS/MLSS	53%		
53	MLSS Inventory	86,512	lbs	SRT * Line 51
54				
55	Aeration Requirement			
56	BODL	9,357	lbs O2/d	dO/dt=eL [Line 6 CBOD load]
57	TKN oxidation	3,887	lbs O2/d	dO/dt = 4.6 * TKN
58	WAS oxygen equivalent	(2,115)	lbs O2/d	dO/dt = 1.42 * dM/dt
59	Total AOR required	11,129	lbs O2/d	
59A	Actual AOR provided		lbs O2/d	Manual input
60				
61	Aeration Volume Required			
62	MLSS Limit	2.07	MG	MLSS Inventory/(MLSS limit * 8.34)
63	OUR Limit	1.39	MG	(AOR/24)/(OUR limit * 8.34)
64	HRT Limit	0.00	MG	(Q/24) * Min HRT
65	**Aeration Design Volume Required**	**2.07**	**MG**	Max of the three volumes above
65A	**Actual aeration basin volume provided**	**2.40**	**MG**	Manual input
66	**Actual anoxic basin volume provided**	**0.5**	**MG**	Manual input

Line	Parameter	Value	Units	Notes
66A	**Actual anaerobic basin volume provided**	**0.29**	**MG**	Manual input
67	**Total anoxic ana + aeration basin volume provided**	**3.19**	**MG**	Line 65A + Line 66 + Line 66A BASED ON SRT Ana+Anox+Aer
68				
69				
70				
71				
72				
73				
74				
75	MLSS Concentration	3,252	mg/L	MLSS Inventory/(Aer + Anox Vol)/8.34 [Line 53/Line67/8.34]
76	OUR	23.2	mg/L/hr	AOR/24/Aeration Vol/8.34
77	F:M ratio	0.25	lbs CBOD5/lb MLVSS/d	CBOD5/(MLVSS Prod * SRT) based on anox. + aer.
78	CBOD Volumetric Loading	14.6	lbs CBOD5/1000 cf/d	CBOD5*1000/(Aeration Vol/7.48) based on anox. + aer.
79	HRT (aeration basin only)	12.5	hrs.	Aeration vol./influent flowrate
80				
81	**BLOWERS**			
82				
83	Number of Blowers (Operating)	3		Line 35
84	Oxygen transfer required	11,129	lbs O2/d	Line 59
85	Air Requirement			
86	O2 transfer	5,565	scfm	AOR * Line 32
87	Mixing requirement	2,427	scfm	Line 33 * (aeration volume/depth)
88	Aeration air requirement	5,565	scfm	Max of the two values above
89	**Blower Capacity (each) required**	**1,855**	**scfm**	Total air reqd/no of blowers
89A	**Actual blower capacity provided (each)**		**scfm**	Manual input
90	**Blower bhp (each) required**	**108**	**bhp**	(AOR/24)*Line 34/Line 83
90A	**Actual blower motor horsepower (each)**		**hp**	Manual input



Appendix J - Detailed Process Design Summary
Webster City WWTF Improvements
Facility Plan - August 2022
BioWin Model Effluent Parameters - UCT Process

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Winter AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
MLE Process Design

Line	Parameter	Value	Units	Notes
1	**INPUT DATA**			
2				
3	**Aerobic Process Loading**			
4				
5	Flowrate	4.59	MGD	Manual input
5A	CBOD5 mass to secondary process	7,446	lbs.CBOD/d	Manual input
5B	CBOD mass removed with denitrification	1,208	lbs.CBOD/d	Manual input
6	CBOD5 mass to aeration basins	6,238	lbs/d	Line 5A - Line 5B
7	TKN mass	845	lbs/d	Manual input
7A	P Mass Removed (75% of Total)	110	lbs/d	Manual input
8	Alkalinity concentration	134	mg/L CaCO3	Manual input, Based on City Sampling applied to ADW flow
9	Fixed TSS, % of total TSS	25%	of TSS	Manual input
10	Inert VSS, % of total TSS	10%	of TSS	Manual input
10A				
11	TSS mass	8,104	lbs/d	Manual input
12				
13	**Process Design Parameters**			
14				
15				
16	SRT (including anoxic and aerobic basins)	20	days	Manual input
17	Temperature	10	degrees C	Manual input
18	MLSS concentration (max)	5000	mg/L	Manual input
19	Oxygen Uptake Rate (max)	40	mg/L/hr	Manual input
20	Clarifier hydraulic load (max)	500	gpd/sf	Manual input
21	Number of aeration basins	1		Manual input
22	Number of clarifiers	3		Manual input
23	RAS ratio	100%		Manual input
24	Clarifier solids load (max)	30	lbs/d/sf	Manual input
25	a, Yield factor	0.4	lbs. VSS/lb. CBODL removed	Manual input
26	b, Endogenous decay factor at 20 deg C	0.2	lbs VSS destroyed/lb VSS/d	Manual input
27	Ratio CBODL:CBOD5	1.5		Manual input
28	e, CBOD removal efficiency	100%		Manual input
28A	P solids production chem P removal	10.0	lbs solids / lb P removed	Manual input
29	Min aeration HRT	0	hrs	Manual input
30	Aeration Basin Depth	16	ft	Manual input
31				

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Winter AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
MLE Process Design

Line	Parameter	Value	Units	Notes
32	Aeration air requirement, O2 transfer	0.5	scfm/lb O2 per day transfer	Manual input
33	Aeration air requirement, mixing	0.14	scfm/sq ft basin	Manual input
34	Blower power	0.7	bhp-hr/lb O2	Manual input
35	Number of blowers (operating)	3		Manual input
36	Thickened sludge concentration	4.5%		Manual input
37				
38				
39				
40				
41	**AERATION BASINS**			
42				
43				
44	b, decay factor at operating temp.	0.1	lbs VSS destroyed/lb VSS/d	Line 26 + 0.01(T - 20)
45	L, CBODL Loading to aeration basins	9,357	lbs/d	Line 6 * Line 27
46	L, CBODL Loading to activated sludge process	11,169	lbs/d	Line 5A * Line 27
47	Sludge Production Rate			
48	MLVSS Production	2,085	lbs/d	dM/dt = aeL[1-0.8bSRT/(1+bSRT) [Line 46 CBOD load]
49	Inert VSS Production	810	lbs/d	Line 10*Line 11
49A	Chem P Removal Solids Production	1,100	lbs/d	Line 7A * Line 28A
50	Fixed MLSS Production	2,026	lbs/d	Line 9 * Line 11
51	**Total MLSS Production**	**6,021**	**lbs/d**	
52	MLVSS/MLSS	48%		
53	MLSS Inventory	120,426	lbs	SRT * Line 51
54				
55	Aeration Requirement			
56	BODL	9,357	lbs O2/d	dO/dt=eL [Line 6 CBOD load]
57	TKN oxidation	3,887	lbs O2/d	dO/dt = 4.6 * TKN
58	WAS oxygen equivalent	(2,961)	lbs O2/d	dO/dt = 1.42 * dM/dt
59	Total AOR required	10,283	lbs O2/d	
59A	Actual AOR provided		lbs O2/d	Manual input
60				
61	Aeration Volume Required			
62	MLSS Limit	2.89	MG	MLSS Inventory/(MLSS limit * 8.34)
63	OUR Limit	1.28	MG	(AOR/24)/(OUR limit * 8.34)
64	HRT Limit	0.00	MG	(Q/24) * Min HRT
65	**Aeration Design Volume Required**	**2.89**	**MG**	Max of the three volumes above
65A	**Actual aeration basin volume provided**	**2.60**	**MG**	Manual input
66	**Actual anoxic basin volume provided**	**0.65**	**MG**	Manual input

Line	Parameter	Value	Units	Notes
66A	**Actual anaerobic basin volume provided**		**MG**	Manual input
67	**Total anoxic ana + aeration basin volume provided**	**3.25**	**MG**	Line 65A + Line 66 + Line 66A BASED ON 20d SRT Ana+Anox+Aer
68				
69				
70				
71				
72				
73				
74				
75	MLSS Concentration	4,443	mg/L	MLSS Inventory/(Aer + Anox Vol)/8.34 [Line 53/Line67/8.34]
76	OUR	19.8	mg/L/hr	AOR/24/Aeration Vol/8.34
77	F:M ratio	0.18	lbs CBOD5/lb MLVSS/d	CBOD5/(MLVSS Prod * SRT) based on anox. + aer.
78	CBOD Volumetric Loading	17.1	lbs CBOD5/1000 cf/d	CBOD5*1000/(Aeration Vol/7.48) based on anox. + aer.
79	HRT (aeration basin only)	13.6	hrs.	Aeration vol./influent flowrate
80				
81	**BLOWERS**			
82				
83	Number of Blowers (Operating)	3		Line 35
84	Oxygen transfer required	10,283	lbs O2/d	Line 59
85	Air Requirement			
86	O2 transfer	5,142	scfm	AOR * Line 32
87	Mixing requirement	3,378	scfm	Line 33 * (aeration volume/depth)
88	Aeration air requirement	5,142	scfm	Max of the two values above
89	**Blower Capacity (each) required**	**1,714**	**scfm**	Total air reqd/no of blowers
89A	**Actual blower capacity provided (each)**		**scfm**	Manual input
90	**Blower bhp (each) required**	**100**	**bhp**	(AOR/24)*Line 34/Line 83
90A	**Actual blower motor horsepower (each)**		**hp**	Manual input

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Winter AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
MLE Process Design

Line	Parameter	Value	Units	Notes
102	**SLUDGE PRODUCTION**			
103				
104	Daily solids production	6,021	lbs/d	Line 51
105	Thickened sludge concentration	4.5%		Line 36
106	Approximate WAS concentration	8,886	mg/L	MLSS*(1+RAS ratio)/RAS ratio
107	**Volume WAS per day**	**81,250**	**gal/d**	1000000*WAS lbs/(WAS conc. *8.34)
108	**Volume thickened sludge per day**	**16,044**	**gal/d**	WAS lbs/(thickened conc. * 8.34)
109				
110	**ALKALINITY**			
111				
112	Raw alkalinity concentration	134	mg/L CaCO3	Line 8
113	Alkalinity residual goal	(100)	mg/L CaCO3	Manual input
114	Alkalinty available	34	mg/L CaCO3	
115	Raw alkalinity mass available	1,302	lbs/d CaCO3	Q*alkalinity available*8.34
115A	Alkalinity mass recovered with denitrification	2,282	lbs/d CaCO3	Manual input
116	Alkalinity consumed	(6,000)	lbs/d CaCO3	TKN mass * 7.1
117	Alkalinity Deficiency (excess)	2,416	lbs/d CaCO3	
118	Hydrated lime requirement	0.89	tons/d	alk reqd/1.35/2000
119	Magnesium Hydroxide slurry requirement			
120	Alkalinity equivalent	1.71	lbs. CaCO3/lb. Mg(OH)2	Manual input
121	Slurry concentration	61%		Manual input
122	**Magnesium Hydroxide slurry requirement**	**2,316**	**Lbs/d**	alk reqd/Line 120/Line 121

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Summer AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
MLE Process Design

Line	Parameter	Value	Units	Notes
1	**INPUT DATA**			
2				
3	**Aerobic Process Loading**			
4				
5	Flowrate	4.59	MGD	Manual input
5A	CBOD5 mass to secondary process	7,446	lbs.CBOD/d	Manual input
5B	CBOD mass removed with denitrification	1,208	lbs.CBOD/d	Manual input
6	CBOD5 mass to aeration basins	6,238	lbs/d	Line 5A - Line 5B
7	TKN mass	845	lbs/d	Manual input
7A	P Mass Removed (75% of Total)	110	lbs/d	Manual input
8	Alkalinity concentration	134	mg/L CaCO3	Manual input, Based on City Sampling applied to ADW flow
9	Fixed TSS, % of total TSS	25%	of TSS	Manual input
10	Inert VSS, % of total TSS	10%	of TSS	Manual input
10A				
11	TSS mass	8,104	lbs/d	Manual input
12				
13	**Process Design Parameters**			
14				
15				
16	SRT (including anoxic and aerobic basins)	20	days	Manual input
17	Temperature	25	degrees C	Manual input
18	MLSS concentration (max)	5000	mg/L	Manual input
19	Oxygen Uptake Rate (max)	40	mg/L/hr	Manual input
20	Clarifier hydraulic load (max)	500	gpd/sf	Manual input
21	Number of aeration basins	1		Manual input
22	Number of clarifiers	3		Manual input
23	RAS ratio	100%		Manual input
24	Clarifier solids load (max)	35	lbs/d/sf	Manual input
25	a, Yield factor	0.4	lbs. VSS/lb. CBODL removed	Manual input
26	b, Endogenous decay factor at 20 deg C	0.2	lbs VSS destroyed/lb VSS/d	Manual input
27	Ratio CBODL:CBOD5	1.5		Manual input
28	e, CBOD removal efficiency	100%		Manual input
28A	P solids production chem P removal	10.0	lbs solids / lb P removed	Manual input
29	Min aeration HRT	2	hrs	Manual input
30	Aeration Basin Depth	16	ft	Manual input
31				

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Summer AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
MLE Process Design

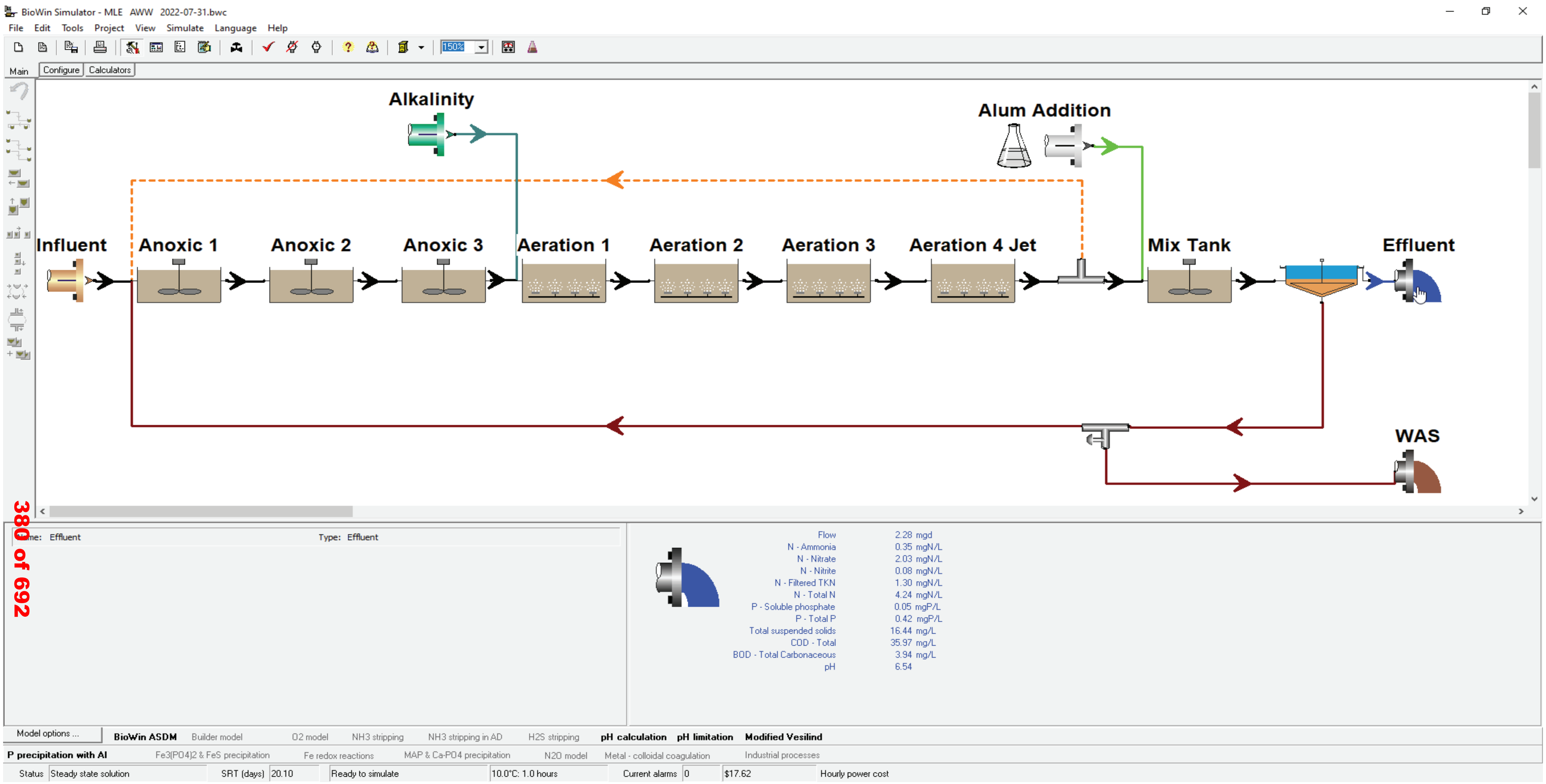
Line	Parameter	Value	Units	Notes
32	Aeration air requirement, O2 transfer	0.5	scfm/lb O2 per day transfer	Manual input
33	Aeration air requirement, mixing	0.14	scfm/sq ft basin	Manual input
34	Blower power	0.7	bhp-hr/lb O2	Manual input
35	Number of blowers (operating)	3		Manual input
36	Thickened sludge concentration	4.5%		Manual input
37				
38				
39				
40				
41	**AERATION BASINS**			
42				
43				
44	b, decay factor at operating temp.	0.25	lbs VSS destroyed/lb VSS/d	Line 26 + 0.01(T - 20)
45	L, CBODL Loading to aeration basins	9,357	lbs/d	Line 6 * Line 27
46	L, CBODL Loading to activated sludge process	11,169	lbs/d	Line 5A * Line 27
47	Sludge Production Rate			
48	MLVSS Production	1,489	lbs/d	dM/dt = aeL[1-0.8bSRT/(1+bSRT) [Line 46 CBOD load]
49	Inert VSS Production	810	lbs/d	Line 10*Line 11
49A	Chem P Removal Solids Production	1,100	lbs/d	Line 7A * Line 28A
50	Fixed MLSS Production	2,026	lbs/d	Line 9 * Line 11
51	**Total MLSS Production**	**5,426**	**lbs/d**	
52	MLVSS/MLSS	42%		
53	MLSS Inventory	108,512	lbs	SRT * Line 51
54				
55	Aeration Requirement			
56	BODL	9,357	lbs O2/d	dO/dt=eL [Line 6 CBOD load]
57	TKN oxidation	3,887	lbs O2/d	dO/dt = 4.6 * TKN
58	WAS oxygen equivalent	(2,115)	lbs O2/d	dO/dt = 1.42 * dM/dt
59	Total AOR required	11,129	lbs O2/d	
59A	Actual AOR provided		lbs O2/d	Manual input
60				
61	Aeration Volume Required			
62	MLSS Limit	2.60	MG	MLSS Inventory/(MLSS limit * 8.34)
63	OUR Limit	1.39	MG	(AOR/24)/(OUR limit * 8.34)
64	HRT Limit	0.38	MG	(Q/24) * Min HRT
65	**Aeration Design Volume Required**	**2.60**	**MG**	Max of the three volumes above
65A	**Actual aeration basin volume provided**	**2.60**	**MG**	Manual input
66	**Actual anoxic basin volume provided**	**0.65**	**MG**	Manual input

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Summer AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
MLE Process Design

Line	Parameter	Value	Units	Notes
66A	**Actual anaerobic basin volume provided**	**0**	**MG**	Manual input
67	**Total anoxic ana + aeration basin volume provided**	**3.25**	**MG**	Line 65A + Line 66 + Line 66A BASED ON 20d SRT Ana+Anox+Aer
68				
69				
70				
71				
72				
73				
74				
75	MLSS Concentration	4,003	mg/L	MLSS Inventory/(Aer + Anox Vol)/8.34 [Line 53/Line67/8.34]
76	OUR	21.4	mg/L/hr	AOR/24/Aeration Vol/8.34
77	F:M ratio	0.25	lbs CBOD5/lb MLVSS/d	CBOD5/(MLVSS Prod * SRT) based on anox. + aer.
78	CBOD Volumetric Loading	17.1	lbs CBOD5/1000 cf/d	CBOD5*1000/(Aeration Vol/7.48) based on anox. + aer.
79	HRT (aeration basin only)	13.6	hrs.	Aeration vol./influent flowrate
80				
81	**BLOWERS**			
82				
83	Number of Blowers (Operating)	3		Line 35
84	Oxygen transfer required	11,129	lbs O2/d	Line 59
85	Air Requirement			
86	O2 transfer	5,565	scfm	AOR * Line 32
87	Mixing requirement	3,044	scfm	Line 33 * (aeration volume/depth)
88	Aeration air requirement	5,565	scfm	Max of the two values above
89	**Blower Capacity (each) required**	**1,855**	**scfm**	Total air reqd/no of blowers
89A	**Actual blower capacity provided (each)**		**scfm**	Manual input
90	**Blower bhp (each) required**	**108**	**bhp**	(AOR/24)*Line 34/Line 83
90A	**Actual blower motor horsepower (each)**		**hp**	Manual input

Webster City - 2022 Facility Plan
Activated Sludge Process Analysis
Summer AWW Loads   Aeration Basin and Sludge Yield Calculations
Design Control 40 mg O2/L/hr or 5,000 mg/L MLSS or 15lbs CBOD/1000 CF Basin Volume
MLE Process Design

Line	Parameter	Value	Units	Notes
102	**SLUDGE PRODUCTION**			
103				
104	Daily solids production	5,426	lbs/d	Line 51
105	Thickened sludge concentration	4.5%		Line 36
106	Approximate WAS concentration	8,007	mg/L	MLSS*(1+RAS ratio)/RAS ratio
107	**Volume WAS per day**	**81,250**	**gal/d**	1000000*WAS lbs/(WAS conc. *8.34)
108	**Volume thickened sludge per day**	**14,457**	**gal/d**	WAS lbs/(thickened conc. * 8.34)
109				
110	**ALKALINITY**			
111				
112	Raw alkalinity concentration	134	mg/L CaCO3	Line 8
113	Alkalinity residual goal	(100)	mg/L CaCO3	Manual input
114	Alkalinty available	34	mg/L CaCO3	
115	Raw alkalinity mass available	1,302	lbs/d CaCO3	Q*alkalinity available*8.34
115A	Alkalinity mass recovered with denitrification	1,544	lbs/d CaCO3	Manual input
116	Alkalinity consumed	(6,000)	lbs/d CaCO3	TKN mass * 7.1
117	Alkalinity Deficiency (excess)	3,154	lbs/d CaCO3	
118	Hydrated lime requirement	1.17	tons/d	alk reqd/1.35/2000
119	Magnesium Hydroxide slurry requirement			
120	Alkalinity equivalent	1.71	lbs. CaCO3/lb. Mg(OH)2	Manual input
121	Slurry concentration	61%		Manual input
122	**Magnesium Hydroxide slurry requirement**	**3,024**	**Lbs/d**	alk reqd/Line 120/Line 121


BioWin Simulator - MLE AWW 2022-07-31.bwc
File Edit Tools Project View Simulate Language Help
Main Configure Calculators
Alkalinity
Alum Addition
Influent
Anoxic 1
Anoxic 2
Anoxic 3
Aeration 1
Aeration 2
Aeration 3
Aeration 4 Jet
Mix Tank
Effluent
WAS
Name: Effluent
Type: Effluent
Flow 2.28 mgd
N - Ammonia 0.35 mgN/L
N - Nitrate 2.03 mgN/L
N - Nitrite 0.08 mgN/L
N - Filtered TKN 1.30 mgN/L
N - Total N 4.24 mgN/L
P - Soluble phosphate 0.05 mgP/L
P - Total P 0.42 mgP/L
Total suspended solids 16.44 mg/L
COD - Total 35.97 mg/L
BOD - Total Carbonaceous 3.94 mg/L
pH 6.54
Model options ...
BioWin ASDM Builder model O2 model NH3 stripping NH3 stripping in AD H2S stripping pH calculation pH limitation Modified Vesilind
P precipitation with Al Fe3(PO4)2 & FeS precipitation Fe redox reactions MAP & Ca-PO4 precipitation N2O model Metal - colloidal coagulation Industrial processes
Status Steady state solution SRT (days) 20.10 Ready to simulate 10.0°C: 1.0 hours Current alarms 0 $17.62 Hourly power cost

Bioloop® Design Proposal - SNDN Process

Webster City WWTP Sanitaire #31507-22od

INFLUENT WASTEWATER CHARACTERISTICS AND SITE CONDITIONS

Number of Parallel Biological Trains 1

	Per Biological Train		Total all Bio. trains	
Average Annual Flow	4.59	MGD	4.59	MGD
Maximum Month Influent Flow	5.09	MGD	5.09	MGD
Peak Hourly Flow	11.78	MGD	11.78	MGD
BOD5 (20°C)	176	mg/l		
BOD5 (20°C)	7,446	lb/d		
Suspended Solids	191	mg/l		
TKN	20	mg/l		
Total Phosphorus	8	mg/l		
Max Wastewater Temperature	26.667	°C		
Min Wastewater Temperature	10.556	°C		
Ambient Air Temperature	20 - 110	°F		
Site Elevation	1,000	ft		

Bioloop® SNDN PROCESS EFFLUENT QUALITY (MONTHLY AVERAGE)

BOD_5 (20°C)	25	mg/l
Suspended Solids	30	mg/l
NH_3-N	1	mg/l
TN	10	mg/l
Total Phosphorus*	1	mg/l

*Requires chemical precipitation

Bioloop® SNDN PROCESS DESIGN CRITERIA

F / M	0.051	lb BOD5/ lb MLSS / day
SVI (after 30 minutes settling)	150	ml/g
Biological Mixed Liquor Suspended Solids (MLSS) conc.	3,900	mg/l
Waste Sludge Produced (Approx.)	6,834	lb/d
Volume of Sludge Produced (Approx. 0.78% solids)	105,052	gpd
Aerated Hydraulic Retention Time	21.34	Hrs
Sludge Age	21.5	Days
Sufficient Alkalinity must be provided to maintain basin pH of 6.8		
Chemical dosage (as Alum)	40	mg/l
RAS Pumping Rate	100%	of Maximum Month Flow

Bioloop® SNDN PROCESS BASIN DESIGN DETAILS (PER TRAIN)

			Oxidation Ditches operated in Series	
	Anaerobic	Pre-Anoxic	Ditch 1	Ditch 2
Basin Quantity	1	1	1	1
Volume/Basin (MG)	0.464	0.156	2.261	2.261
Basin Length (ft) - *	52.5	34.0	192.0	192.0
Basin Width (ft)	65.6	34.0	34.0	34.0
Basin Depth (ft)	18.0	18.0	18.0	18.0

* - For oxidation ditches, basin length above is straight section length for Side by Side Ditch Type (see ref. drawing)

Bioloop® SNDN PROCESS EQUIPMENT

	Anaerobic	Pre-Anoxic	Ditch 1	Ditch 2
			Oxidation Ditches operated in Series	
Mixer Quantity/Basin			2	2
Mixer Motor Hp			8.4	8.4
Fine Bubble Diffuser Quantity / Basin / Train			776	776
Biological blower (scfm/basin/train)			1245	1634

Biological Blowers (PD type) 2 Duty + 1 Standby with 100 Hp Motor

OSCAR Control Panel

Instruments and Valves in Basins

Location	Ditch 1	Ditch 2	Quantity
ORP probe	Yes		1
DO probe	Yes	Yes	2
Air modulating valve	1@8 inch	1@8 inch	2
Airflow meter	1@8 inch	1@8 inch	2

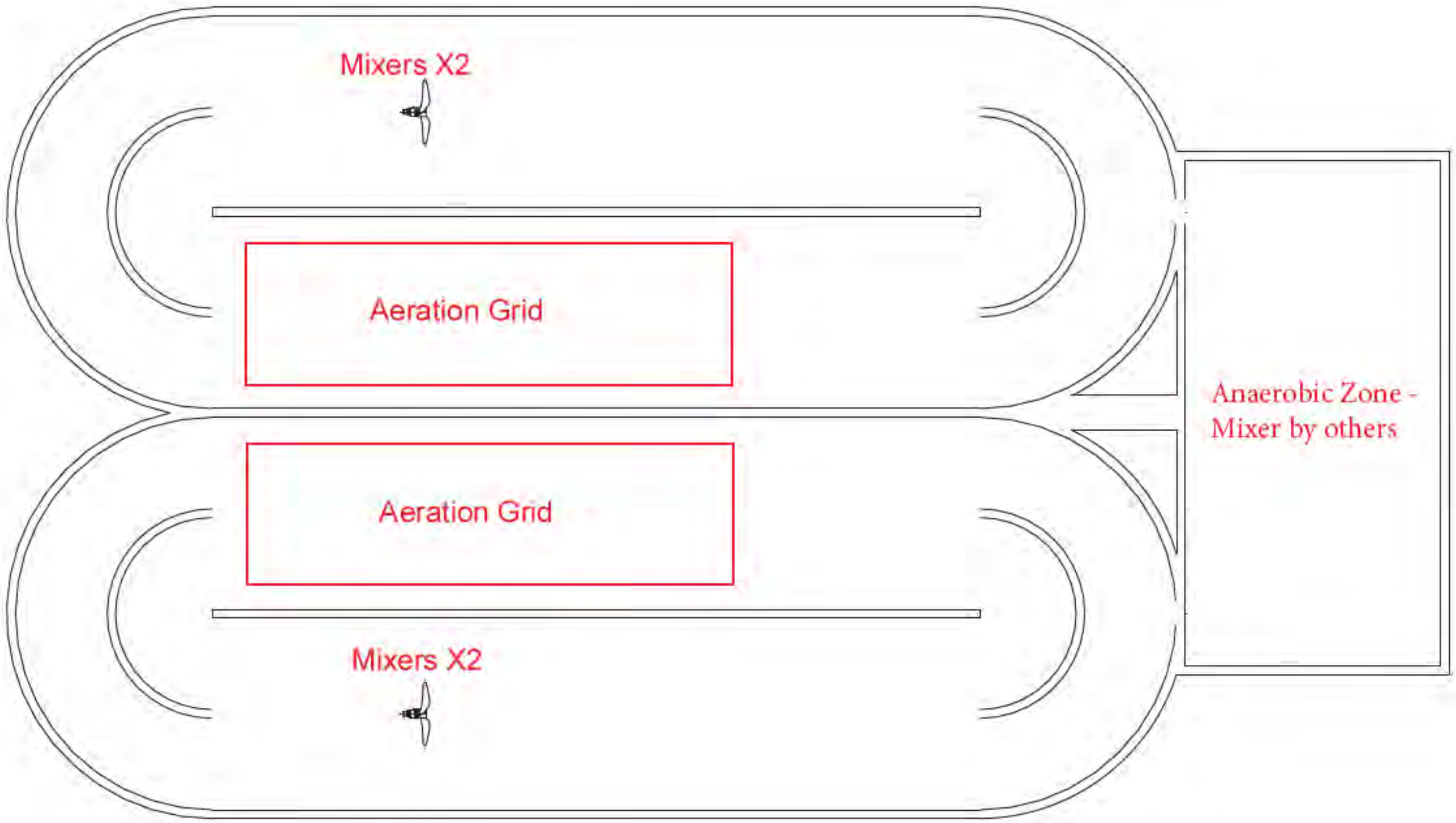
Other Instruments and Valves

Location		Size	
Air pressure transmitter	Bio Blower Discharge		1

Bioloop® SNDN AERATION/MIXING POWER REQUIREMENTS (TOTAL FOR ALL TRAINS)

	Anaerobic	Pre-Anoxic	Ditch 1	Ditch 2		kW-hr/d
			Oxidation Ditches operated in Series			
Basin Quantity	1	1	1	1		
Mixers / Basin			2	2		
Mixer Op. Hp			5.6	5.6		399
Bio Blowers Operating Power		2	at	88.5	Hp	3,169

Total kW-hr/d 3,568



PRELIMINARY – THIS DRAWING IS NOT INTENDED FOR CONTRACT DOCUMENTS, SUBMITTALS OR CONSTRUCTION

Sanitaire a xylem brand BROWN DEER, WISCONSIN 53223	CUST NO. DWG NO.	THIS DRAWING IS THE PROPERTY OF XYLEM AND IS SUBMITTED IN CONFIDENCE. IT IS NOT TO BE DISCLOSED, USED OR DUPLICATED WITHOUT PERMISSION OF XYLEM.		DRAWN BY CHKD BY APP'D BY	DATE DATE DATE	MODEL	JOB SHEET

PROCESS DESCRIPTION
Facility: Webster City, IA WWTP
Proposal Number: OD31507-22
Date: June 22, 2022

Bioloop® Oxidation Ditch with OSCAR™ process performance optimizer – SNDN) Process

For:
Webster City WWTP

Sanitaire Representative:
Electric Pump

June 22, 2022

Re: Webster City

Xylem is pleased to present a comprehensive wastewater treatment process solution by providing an integrated mechanical and electrical system that optimizes biological process performance. Plant operation is the largest life-cycle cost component for a wastewater treatment facility. An integrated and well-engineered control system for your specific requirements is critical for efficient, long-term plant operation, process control, and management. The proposed Bioloop® Oxidation Ditch combines Sanitaire fine bubble diffused aeration and Flygt mixers, coupled with OSCAR™ biological process controls and YSI instrumentation to deliver an energy-efficient process solution that is fully automatic and simple to operate. Our offerings leverage Xylem's unique understanding of aeration and mixing to provide the most efficient system available.

Features and benefits of our solution include:

Proven Solution with Single Supplier Responsibility

- Industry-leading products deliver a reliable solution you can trust.

Low Maintenance/Ease of Operation

- Sanitaire fine bubble diffused aeration equipment is robust, long-lasting, and resistant to clogging.
- Variable speed Flygt submersible mixers respond to load fluctuations and prevent sludge accumulation.
- The OSCAR® process performance optimizer control system provides real-time monitoring of DO and ORP so operators always have the information they need. Automation allows operators to enter setpoints and let the OSCAR® system do the rest.

Minimum Energy Consumption

- Flygt Mixers allow operators to match thrust with changing mixing needs to reduce energy use.
- The most efficient aeration control system available—high efficiency Sanitaire Silver Series II membrane diffusers coupled with OSCAR™ process control employs proprietary ORP and DO control to offer substantial energy savings compared with conventional systems.

Biological Nutrient Removal Process Design

- The SNDN process proposed is designed to oxidize BOD and ammonia, denitrify the wastewater to remove nitrates, and remove phosphorus biologically with chemical precipitation for polishing. The proposed design reduces energy consumption relative to other alternatives, recovers alkalinity, and addresses effluent requirements for nitrogen and phosphorus removal.

A. PROCESS DESIGN

I. SNDN Process Description (Reactors in Series option)

Xylem utilized an empirical model to evaluate the treatment performance of the subject project. Influent characterization, including influent condition and corresponding effluent quality requirements are defined in the attached sizing calculations.

In the SNDN process, two aerated oxidation ditches will be operated in series, followed by secondary clarifiers for solid-liquid separation. The oxygen supply rate to the initial aerated reactors, which will with a higher F:M ratio, will be a controlled rate so that the oxygen is quickly consumed (called an aerated-anoxic condition). The aerated reactor at the back end of the process will be maintained in an aerobic state and will remove any residual ammonia, but the majority of the ammonia will be converted to nitrate in the upstream aerated anoxic reactors.

As the liquor circulates away from the diffuser grids, most of the dissolved oxygen and nitrates will be consumed, resulting in anaerobic conditions to promote biological phosphorus removal. An anaerobic environment supports the selection of phosphorus accumulating organisms (PAOs). Anaerobic conditions also enhance hydrolysis of slowly biodegradable substrates to readily biodegradable substrates. The presence of PAOs provides excess phosphorus removal by elevating the phosphorus uptake of the biomass in excess to that required for cell growth. The anaerobic conditions, combined with readily available biodegradable substrate, promote the release of phosphorus into solution. The phosphorus rich solution, combined with an aerobic environment and PAOs, results in an uptake of the phosphorus previously released in the outer channel as well as additional phosphorus uptake commonly referred to as luxury uptake. Phosphorus is ultimately removed from the system through sludge wasting.

Denitrification concludes the nitrogen removal process by converting nitrate from the nitrification step to nitrogen gas which is released to the atmosphere. Denitrification occurs under anoxic conditions, relying on heterotrophic bacteria and readily available biodegradable substrate. Since the initial reactors are maintained in an aerated anoxic state, bacteria in the initial reactors can chemically bind the oxygen in nitrate to reduce readily available biodegradable substrate.

SNDN has been documented by several independent researchers[1234] as an energy-efficient method of total nitrogen removal. This process has also been successfully demonstrated at full-scale wastewater plants with fine bubble diffused aeration (FBDA), such as the Sanitiare oxidation ditches in Holmen, WI and the fine bubble diffused aeration plant in Fond Du Lac, WI The challenge for maintaining Aerated Anoxic with FBDA has been the need to limit the oxygen supply rate during low temperatures and/or low influent load while maintaining mixing. The Bioloop® process addresses this need by using a combination of FBDA and submersible mixers to allow independent control of the mixing and oxygen supply rates.

The discharge from the inner channel flows to the secondary clarifiers. Return activated sludge (RAS) flows from the clarifiers to the beginning of the biological process (outer channel) to ensure that a healthy biomass is maintained in the biological basins. The excess sludge produced, the waste activated sludge (WAS), is taken out of the system to maintain a stable sludge mass (i.e., SRT). The schematic below shows the general process layout.

REDUNDANCY

To allow maintenance, the **Bioloop® Oxidation Ditch** system can also treat 50% of the design average annual mass load or more with any of the two ditches out of service. With the blowers supplying air to the diffuser grids in a common manifold, it is easy to increase the aeration rate to the remaining tanks when a basin is taken off-line.

Each oxidation ditch has two aeration grids. During periods of low load, either of the aeration grids can be shut off (using manually actuated valves) to allow the air supply to be turned down further, ensuring that aerated anoxic conditions needed for TN removal and anaerobic conditions needed for enhanced biological phosphorus removal can be maintained. ORP and DO probes, airflow meters, and airflow modulating valves provided by Sanitaire, along with an operator input to the HMI,will be used to control the oxygen supply to each ditch to maintain the optimum environment for biological nutrient removal.

Another benefit of operating multiple reactors in series during normal operation is that all or a fraction of the influent can be diverted to the downstream ditch during a peak flow event and/or a plant upset that impairs settling (step-feed or contact stabilization mode). This allows higher MLSS concentrations and/or higher SVI conditions to be tolerated without oversizing the secondary clarifiers, while maintaining good effluent quality throughout the peak flow or plant upset event. The switch from the normal operating mode to step-feed or contact stabilization can be accomplished with adjustable weir gates in a splitter box. This technique for handling peak flows has been demonstrated at hundreds of wastewater plants across the United States.

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[1] Littleton, Daigger, Strom, Mechanisms of Simultaneous Biological Nutrient Removal in Closed Loop Reactors, WEFTEC 2003

[2] Barnard, Dunlap, Steichen, Utilizing Simultaneous Nitrification and Denitrification in BNR Plants to the Maximum Effect, WEFTEC 2013

[3] Jimenez, Simultaneous Nitrification-Denitrification to Meet Low Effluent Nitrogen Limits, VWEA 2012

[4] Fitzgerald, Noguera, Camejo, Ammonia-oxidizing microbial communities in reactors with efficient nitrification at low-dissolved oxygen, Water Research – Dec 2014

Appendix K: Preliminary Geotechnical Report

ALLENDER BUTZKE ENGINEERS INC.
GEOTECHNICAL • ENVIRONMENTAL • CONSTRUCTION Q. C.

June 1, 2021 **PN 211124**

GEOTECHNICAL EXPLORATION

FORCEMAIN AND PRELIMINARY WWTF IMPROVEMENTS
E OHIO STREET EXTENDING SOUTH OF HIGHWAY 20
WEBSTER CITY, IOWA

PERFORMED FOR

CITY OF WEBSTER CITY
400 2ND STREET, P.O. BOX 217
WEBSTER CITY, IA 50595

3660 109TH STREET • URBANDALE, IOWA 50322 • PHONE 515-252-1885 • FAX 515-252-1888

ALLENDER BUTZKE ENGINEERS INC.

GEOTECHNICAL • ENVIRONMENTAL • CONSTRUCTION Q. C.

June 1, 2021

City of Webster City
400 2nd Street, P.O. Box 217
Webster City, IA 50595
Attn: Ken Wetzler

RE: Geotechnical Exploration
Forcemain and Preliminary WWTF Improvements
E Ohio Street extending South of Highway 20
Webster City, Iowa
PN 211124

Dear Mr. Wetzler:

As authorized by you, Allender Butzke Engineers Inc. (ABE) has completed the geotechnical exploration for the above referenced project. The geotechnical exploration was conducted to evaluate physical characteristics of subsurface conditions with respect to preliminary design and construction of this project. The enclosed report summarizes the project characteristics as we understand them, presents the findings of the borings and laboratory tests, discusses the observed subsurface conditions, and provides geotechnical engineering recommendations for this project.

We appreciate the opportunity to provide our geotechnical engineering services for this project. If you have any questions or need further assistance, please contact us at your convenience. We are also staffed and equipped to provide construction testing and inspection services on this project as well as environmental site assessments.

Respectfully submitted,
ALLENDER BUTZKE ENGINEERS INC.

Matt Drummond, P.E.
Project Engineer

David Logemann, P.E.
Principal Engineer

LICENSED PROFESSIONAL ENGINEER MATTHEW J. DRUMMOND 21407 IOWA	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. 6/1/2021 Matthew J. Drummond, P.E. License Number 21407 Date My license renewal date is December 31, 2022. Pages covered by this seal: All Pages .

1 PC and 1 Email Above
1 Email Bolton & Menk; Attn: Andrew Sindt, P.E.

GEOTECHNICAL EXPLORATION

FORCEMAIN AND PRELIMINARY WWTF IMPROVEMENTS
E OHIO STREET EXTENDING SOUTH OF HIGHWAY 20
WEBSTER CITY, IOWA

PN 211124

TABLE OF CONTENTS

GEOTECHNICAL EXPLORATION

FORCEMAIN AND PRELIMINARY WWTF IMPROVEMENTS
E OHIO STREET EXTENDING SOUTH OF HIGHWAY 20
WEBSTER CITY, IOWA

PN 211124

June 1, 2021

PROJECT INFORMATION

The City of Webster City, with design assistance from Bolton & Menk, is planning a new wastewater forcemain and treatment facility (WWTF) located southeast of Webster City in Hamilton County, Iowa. The proposed forcemain is expected to follow a route east of the existing wastewater treatment facility following the Boone River Recreation Trail south. The forcemain will cross below US Highway 20 which will require trenchless construction methods. The WWTF is in preliminary design phases and locations and depths of proposed structures are not available at the time of this report. We recommend additional borings for WWTF structures and lagoon be conducted in the future to provide geotechnical recommendations for final design of the project.

FIELD EXPLORATION

Eighteen borings were conducted at this site to depths of 14.1 to 39.1 feet below existing grades on February 17 through 19 and March 2, 2021. Approximate locations of test borings are shown on the preceding Figure Nos. 1 and 2 and enclosed Site Plan. Boring locations were staked and recorded at the site by Bolton & Menk during a field meeting with ABE, Bolton & Menk, and the City on February 12, 2021. The location of Boring No. 19 was offset approximately 45 feet east from the proposed/surveyed location due to a possible buried utility (sewer) and overhead electric lines. Boring No. 9 was not conducted due to shallow bedrock conditions encountered in Boring No. 8 on the north side of US Highway 20. Boring surface elevations, indicated on the enclosed Boring Logs, were provided by Bolton & Menk for the surveyed boring locations. Methods of drilling, sampling, standard laboratory testing, and classifying of subsurface materials are discussed in the Boring Log Description/Legend pages of the Appendix.

Figure No. 1 - Site Overview with Soil Boring Locations

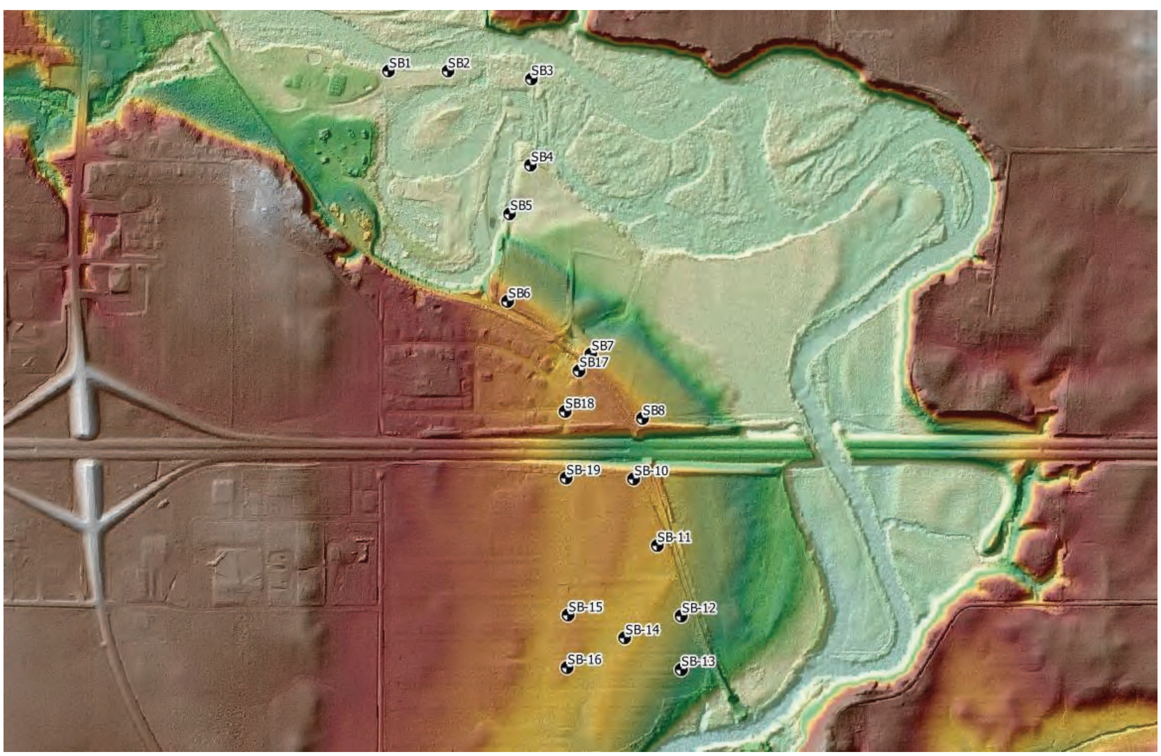


Figure No. 2 - Hillshade Model with Soil Boring Locations

SUBSURFACE CONDITIONS

Site Geology

This project site is located within a geomorphic region known as the "Des Moines Glacial Lobe." The Wisconsinan glacier was the last glacier to advance into north central Iowa. The brown to brown-gray Wisconsinan supraglacial till present near the surface and deposited as the glacier retreated, typically consists of sandy lean clay with random zones of high sand and silt content. Fine grained deposits of very dark gray locally derived alluvium are commonly encountered at the surface in isolated upland depressions. The deeper dark gray Wisconsinan subglacial till, deposited as the glacier advanced, consists of a more homogeneous mixture of sand, silt, and clay. It is not uncommon to encounter relatively thick sand layers, termed glacial outwash deposits, within the glacial till formation as well as random cobbles and boulders.

The low-lying northern portion of the forcemain site is located within the reclaimed flood plain of the Boone River. The natural topography within the flood plain exhibits little relief and is relatively level. Fill materials encountered at the surface have been placed for development or reclamation of the flood plain area. The natural soil profile encountered below the fill materials consists primarily of cohesive alluvial soils comprised of silts and clays grading to extensive deposits of sand and gravel associated with depositional events of the waterway.

The overburden Wisconsinan glacial till and alluvium soils are underlain by the Mississippian bedrock system consisting primarily of undifferentiated formations of dolomite, limestone, and sandstone.

Soil Profile

Detailed descriptions of soils encountered by this exploration are provided on the Boring Logs enclosed in the Appendix. The Profile of Borings presented in the Appendix depict the relative deposit elevations in borings conducted along the sanitary sewer forcemain (Plates A-1 and A-2) and future wastewater treatment facility (Plates A-3 and A-4). Following is a discussion of the subsurface materials encountered in the borings. Unless otherwise indicated, the depths of soil stratum and groundwater levels are referenced from below existing grade at the individual boring locations at the time of drilling.

Boring Nos. 1 through 5 were conducted along the forcemain alignment in the lower lying portion of the site near the Boone River floodplain and encountered granular and cohesive alluvium soils consisting primarily of silty and clayey sand (SM and SP) with clay seams or layers, grading to medium to coarse sand with gravel below depths of approximately 12 to 14 feet. Boring Nos. 1 through 4 terminated in loose to medium dense saturated sand and gravel near depths of 15 feet. Cohesive alluvium with sand was more prevalent in Boring No. 5 which terminated in very moist and soft to stiff sandy lean clay (CL) alluvium near a depth of 15 feet.

Boring Nos. 6 through 19 were conducted along upland portions of the forcemain route and at the future wastewater treatment plant site. Borings in the upland portions of the site encountered a typical soil sequence consisting primarily of sandy lean clay (CL) fill or topsoil overlying brown-gray sandy lean clay (CL) Wisconsinan supraglacial till, dark gray sandy lean clay (CL) Wisconsinan subglacial till, silty fine to medium sand (SM) glacial outwash, and limestone bedrock.

Moist to very moist and medium stiff fill encountered in Boring Nos. 7, 8, 10 through 12, 17, and 18 extended to depths of 3 to 5.5. feet. Very moist and medium stiff topsoil encountered at the surface in Boring Nos. 6 and 13 through 16 extended to depths of approximately 1 to 1.5 feet. The fill or topsoil was underlain by moist to very moist and medium stiff to very stiff Wisconsinan supraglacial till which extended to depths between 7.5 and 15.5 feet in the borings. Random sand seams and thicker glacial outwash (sand) layers were observed in Boring Nos. 6 through 19 between various depths of 3 to 30 feet. Damp to moist and stiff to hard Wisconsinan subglacial till was encountered underlying the supraglacial till. Boring No. 11 terminated in stiff subglacial till near a depth of 15 feet. Boring Nos. 6 and 7 terminated in hard subglacial till near depths of 30 feet. Boring No. 17 terminated in medium dense glacial outwash near a depth of 30 feet.

Limestone bedrock was encountered underlying the Wisconsinan subglacial till or glacial outwash in Boring Nos. 8, 10, 12 through 16, 18, and 19 below depths of 21 to 30 feet. The upper portion of the bedrock in several borings was fractured/weathered, generally becoming harder with depth. These borings terminated in hard limestone bedrock near depths between 14.1 to 39.1 feet.

Groundwater Level Observations

The borings were monitored during and shortly after drilling operations to detect moisture seepage and groundwater accumulation. The results of our groundwater level observations are noted on the Boring Logs enclosed in the Appendix.

During drilling operations, moisture seepage was noted near depths of 11 to 24 feet in approximately 2/3 of the borings. At the completion of drilling operations, groundwater accumulation was observed between depths of 13 to 15 feet in Boring Nos. 1 through 5 conducted in the lower lying floodplain area of the site, and between depths of 5 to 25 feet in the upland Boring Nos. 6 through 19. Temporary piezometers were installed in Boring Nos. 15 and 16 in the western portion of the future wastewater treatment plant, in the area of the future lagoon. After a period of 7 days, groundwater levels in Boring 15 and 16 were observed near depths of 10.5 feet. It should be recognized that these short-term water levels are not necessarily a true indication of the groundwater table. Long-term observations would be necessary to accurately define the groundwater variations at this site.

Brown-gray mottling of the Wisconsinan glacial till is an indication of past fluctuations of the groundwater in this zone. Therefore, we interpret that past seasonal high groundwater tables have been near depths of 3 to 5 feet or deeper below existing grades. Furthermore, in these subsurface conditions it is common to encounter perched groundwater conditions within sand seams, glacial outwash, and the more variably sandy Wisconsinan supraglacial till overlying the denser, less permeable Wisconsinan subglacial till. Fluctuation of groundwater levels can occur due to seasonal variations in the amount of rainfall, surface drainage, subsurface drainage, site topography, irrigation practices, ground cover (pavement or vegetation), and stage level of the nearby Boone River.

ANALYSES AND RECOMMENDATIONS

Sanitary Forcemain

Limestone bedrock was encountered below depths of 10 to 29 feet. In general, bedrock surface was encountered between approximate elevations 1026 and 1028 feet. The bedrock surface appears to slope gently east and north toward the river. The bedrock was generally shallowest (approximately 10 to 15 feet deep, near elevation 1026.5 feet) in Boring No. 13 conducted in the western portion of the future wastewater treatment facility and deepest in Boring No. 8 below a depth of 30 feet (below approximate elevation 1022 feet). Considering existing Highway 20 grades in the area south of Boring No. 8, near elevation 1026 feet in the center median of Highway 20, we estimate limestone bedrock could be as shallow as 4 feet below ditch level at this potential forcemain crossing location. The limestone bedrock surface in Boring Nos. 18 and 19 conducted north and south of Highway 20, east of the substation and overhead power lines, was encountered between approximate elevations 1026 to 1028 feet. The center ditch of Highway 20 at this potential forcemain crossing appears to be near elevation 1040 feet, or approximately 12 feet or more above the bedrock surface.

Directional boring or other trenchless construction methods may be required to extend the sanitary forcemain below Highway 20. We expect that directional boring operations will likely encounter medium stiff to stiff sandy lean clay (CL) Wisconsinan supraglacial and subglacial till overlying medium dense clayey sand (SC) glacial outwash. The glacial outwash encountered in Boring No. 18 was saturated at the time of drilling. Directional borings which encounter flowing sand layers may require stabilization measures to complete boring operations. It should be noted that trenchless methods that provide continuous support of the tunnel face would be preferable to reduce the risk of ground loss if saturated sands are encountered. If boulders or large rock fragments are encountered during drilling, special core drilling or hand excavating techniques could be required.

Excavation, Stability, Dewatering and Backfilling

Sand is present as alluvium in the lower lying floodplain portions of the forcemain route and as random sand seams or glacial outwash layers in upland locations at the site. We anticipate the majority of excavations for the forcemain and treatment plant site will encounter both granular (sand) and cohesive (clay) soils. The overburden soils can typically be excavated utilizing conventional excavation equipment. Excavations encountering hard limestone bedrock, if any, will likely require rippers, pneumatic tools, hydraulic breakers, or heavier excavation equipment.

Above groundwater levels, the sands can be excavated utilizing conventional excavation equipment. However, the sands are easily disturbed by construction traffic and excavations will most likely require low impact equipment (such a backhoe) to minimize disturbance of these materials. For excavations extending below the water table, it will be necessary to conduct extensive dewatering of the areas with sand points and/or wells prior to excavation. When dewatering, water levels should be maintained a minimum of 2 feet below the bottom of excavations in saturated sands to prevent upward seepage forces which could result in reduced subgrade support.

The extent of bracing or sloping of open cut excavations will be dependent upon depth of cut, groundwater conditions, soils encountered, length of time the excavation will be open, area available for excavation and local governing regulations. Predominately cohesive soils may appear to stand nearly vertical in shallow excavations for short periods of time. However, soil creep, surcharge loads, precipitation, subsurface moisture seepage, construction activity vibrations and other factors may cause these soils to cave within an unpredictable period of time. Excavations encountering sand may tend to cave rapidly, especially if water is flowing through the sand. Unstable granular excavation walls may also cause surrounding cohesive soils to become unstable. Temporary shoring, flattening of the excavation slopes or use of trench boxes may be required to maintain a safe condition. It is to be noted that provisions for shoring and bracing of deep excavations are required of the contractor by OSHA.

All trench and structure backfill should be placed in lifts compatible with compaction equipment. Cohesive (clay) soils should be compacted within a moisture content range of -1 to +4 percent of the material's optimum moisture content. The recommended degree of compaction guidelines for backfill is provided in the following Table A.

TABLE A
RECOMMENDED DEGREE OF COMPACTION GUIDELINES

Construction Application	Standard Proctor (ASTM D698) Cohesive Soil	Standard Proctor (ASTM D698) Cohesionless Soil	*Relative Density (D4253 & D4254) Cohesionless Soil
Class 1	95%	98%	70%
Class 2	90%	93%	45%
Class 3	85%	88%	20%

Class 1 - Subgrade for building foundations, slabs-on-grade, pavements and other critical backfill areas.
Class 2 - Backfill adjacent to structures not supporting other structures - Minor subsidence possible.
Class 3 - Backfill in non-critical areas - Moderate subsidence possible.

*Use Relative Density technique (ASTM D4253 & D4254) where Standard Proctor technique (ASTM D698) does not result in a definable maximum dry density and optimum moisture content.

At the time of this geotechnical exploration, the moisture contents of the onsite cohesive soils were generally above the recommended moisture content range for compaction. Adjustment of soil moisture content will be required to lower or raise the moisture to within the recommended moisture content range. Discing and aeration is generally the most economical method to lower soil moisture content if climatic conditions allow. Chemical modification of very moist soils with quicklime or Class C fly ash can be accomplished if construction scheduling does not permit field drying. If grading or fill placement at the site will be conducted during colder weather, it should be noted that common chemical modification methods may be ineffective when temperatures are near or below 40° Fahrenheit.

WWTF and Lagoon Preliminary Considerations

The future WWTF is planned to be located in the field approximately ¼ mile south of US Highway 20 in the area extending approximately ¼ mile west of the railroad embankment as shown in the following Figure No. 3. The WWTF is in preliminary design phases and locations and depths of proposed structures are not available at the time of this report; however, we understand treatment lagoons may be located in the western portion of the WWTF site. Boring Nos. 12 through 16 were conducted at the WWTF site with Boring Nos. 15 and 16 located in the area of future lagoons.

Figure No. 3 - Proposed WWTF Site and Preliminary Boring Locations

The Iowa Department of Natural Resources (IDNR) suggests 4 feet of separation between the top of the lagoon seal and the maximum groundwater level (18C.3.5.2). A minimum of 2 feet of separation is required when using a soil seal. If the maximum anticipated groundwater table is less than two feet below the bottom of the lagoon, a synthetic liner will be required. The groundwater table at the site is a subdued reflection of the ground surface and will be highest in the slope in the northwest portion of the future WWTF site. Groundwater levels below the future lagoon area measured 7 days after conducting the borings were observed near elevation 1041.6 feet on the north side of the future lagoon site to near elevation 1040.5 feet in the southern portion of the lagoon site. These observed water levels are approximately 1.5 feet below and 2 feet above the level of the denser Wisconsinan subglacial till encountered in Boring Nos. 15 and 16, respectively. Preliminarily, it would be appropriate to establish the preliminary bottom level of the future lagoon at least 2 feet above the level of the denser Wisconsinan subglacial till, at elevation 1045 feet or higher. This level would be 2 feet or more above observed high groundwater levels in the borings. Groundwater levels at the site may fluctuate and longer-term continued measurement of groundwater levels in temporary piezometers at the site could more closely define seasonal high groundwater levels below the future WWTF site and lagoon. If higher groundwater levels are recorded in the future, subsurface drainage along the north and west perimeters of the lagoon could be considered to lower perched groundwater levels within the glacial outwash and more variably sandy Wisconsinan supraglacial till above the level of the denser, less permeable subglacial till.

The IDNR Animal Feeding Operations Siting Website indicates that the proposed WWTF site is located within an area of "Potential Karst" due to bedrock outcrops and shallow depth to bedrock in areas along the Boone River. The IDNR website does not show any documented sinkholes in the Webster City area. Potential karst terrain is indicative of near surface soluble bedrock such as limestone. Limestone bedrock was encountered in the lagoon area borings below approximate elevations 1027 to 1028 feet. Preliminarily establishing the lagoon bottom near or above elevation 1045 feet (based on preliminary groundwater levels or use of subdrains to draw down perched groundwater) would provide 15 feet or more of separation between the bedrock and lagoon bottom. Iowa DNR 18C.3.6.2 indicates a separation of 10 feet between the pond bottom and any bedrock formations is recommended with a minimum separation of 4 feet required. Due to the bedrock depth and presence of overburden glacial till above the limestone, it is our opinion that this site is unlikely to be underlain by karst features.

Boring No. 16 was conducted in the southern portion of the future lagoon site and encountered silty sand (SM) glacial outwash extending to near elevation 1038 feet. The IDNR requires where sand soils are encountered on the lagoon bottom or side slopes for a soil liner, they should be over-excavated a minimum of two feet and backfilled with low permeability cohesive soils. Due to the presence of sand seams, glacial outwash layers, and very sandy zones within the Wisconsinan supraglacial till in the preliminary borings, a two-foot-thick cohesive soil liner will likely be necessary over the entire lagoon bottom and side slopes extending to two feet above the maximum water level to ensure that the sand seams/zones are adequately sealed.

Standard Proctor and falling head permeability tests were performed on samples of the sandy lean clay Wisconsinan supraglacial till and subglacial till soils obtained from depths between 2 to 9 and 9 to 17.5 feet below existing grades in Boring No. 15. The results are provided in the Appendix as Figures PR-1 and PR-2. The following Table B provides the results of Proctor and falling head permeability tests performed on the recompacted representative samples which indicate the on-stie sandy lean clay (CL) Wisconsinan supraglacial till and subglacial till soils would be suitable materials for use as compacted soil liner.

TABLE B
RESULTS OF FALLING HEAD PERMEABILITY TEST

Soil Type (Sample Location)	Moisture Content (percent)	Dry Density (pcf)	Percent Compaction	Permeability (ft/day)	Required Liner Thickness (ft)[1]
Wisconsinan Supraglacial Till Boring No. 15 (2' – 9')	16.1%	112.9	94.5%	4.7×10^{-5}	0.1
Wisconsinan Subglacial Till Boring No. 15 (9' – 17.5')	15.5%	114.0	94.7%	4.9×10^{-5}	0.1

1) Minimum liner thickness required to meet IDNR seepage loss requirement of less than 1/16 inch per day under a maximum water depth of 10 feet. Calculations based on Darcy's Law utilizing a factor of safety equal to 1.

The stiff to very stiff sandy lean clay (CL) Wisconsinan supraglacial and subglacial till encountered in preliminary borings for the WWTF could provide suitable support for future structures. Based on preliminary boring data, the Wisconsinan supraglacial till and newly placed fill would generally be capable of providing net allowable soil bearing pressures on the order of 2,500 pounds per square foot. Higher net allowable soil bearing pressures would be possible for structures bearing deeper in the stiff to very stiff Wisconsinan subglacial till.

GENERAL

The analyses and recommendations in this report are based in part upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations which may occur between borings or across the site. The nature and extent of such variations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

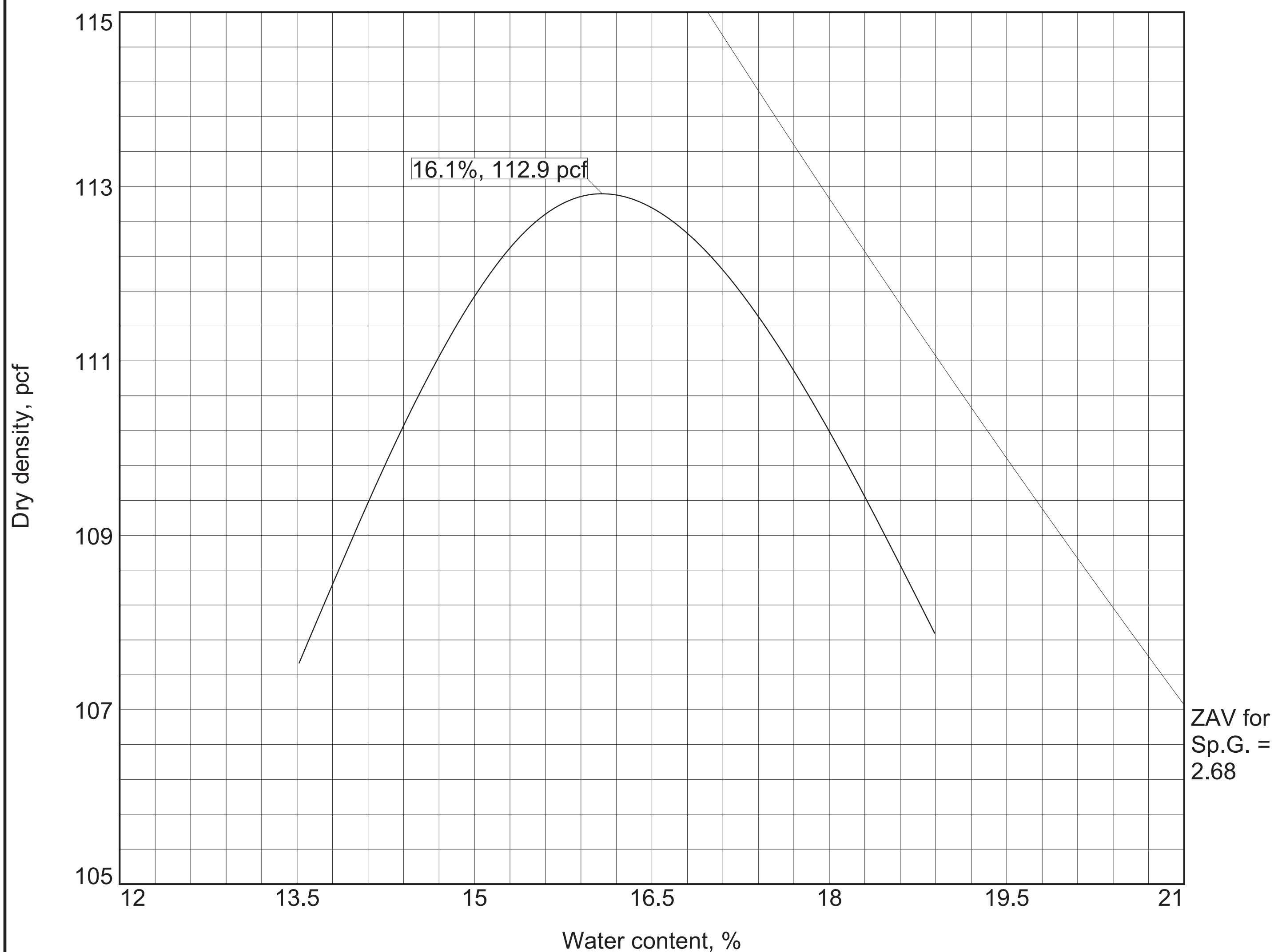
It is recommended that the geotechnical engineer be provided the opportunity to review the plans and specifications so that comments can be made regarding the interpretation and implementation of our geotechnical recommendations in the design and specifications. It is further recommended that the geotechnical engineer be retained for testing and observation during earthwork and foundation construction phases to help determine that the design requirements are fulfilled.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranty, expressed or implied, is made. In the event that any changes in the nature, design or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing by the geotechnical engineer.

The scope of our service was not intended to include any environmental assessment or exploration for the presence of hazardous or toxic materials in the soil, surface water, groundwater or air on, below or adjacent to this site.

APPENDIX

PROCTOR TEST REPORT



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
2' to 9'	CL			2.68				

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 112.9 pcf Optimum moisture = 16.1 %	Brown-gray sandy lean clay, trace gravel

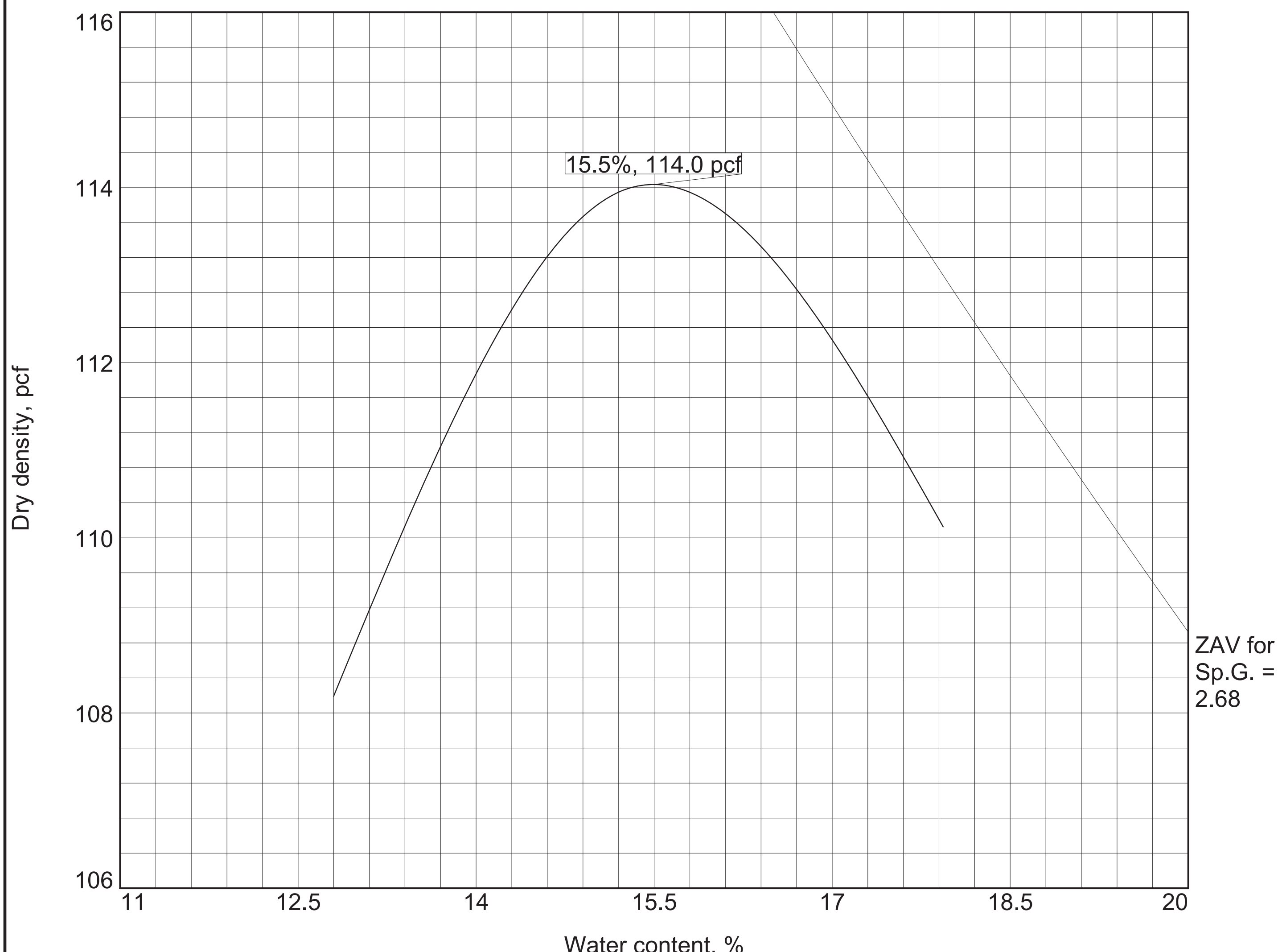
Project No. 211124 **Client:** City of Webster City
Project: Forcemain & Perliminary WWTF Improvements
E Ohio St. Extending South of Highway 20, Webster City, Iowa
○**Location:** Boring No. 15

Remarks:
WISCONSINAN SUPRAGLACIAL TILL

ALLENDER BUTZKE ENGINEERS, INC.

Figure PR-1

PROCTOR TEST REPORT



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
9' to 17.5'	CL			2.68				

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 114.0 pcf Optimum moisture = 15.5 %	Dark gray sandy lean clay, trace gravel

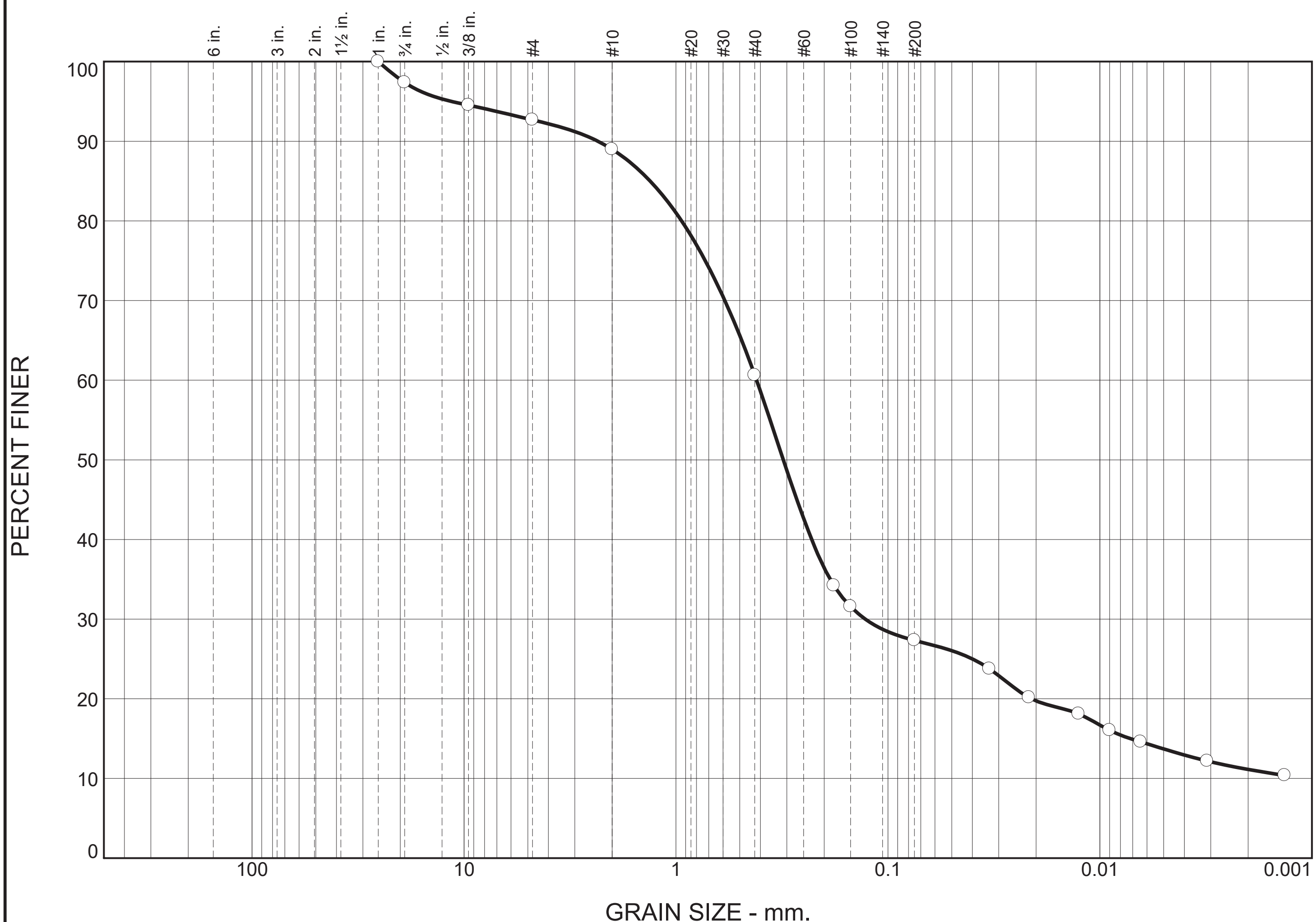
Project No. 211124 **Client:** City of Webster City
Project: Forcemain & Perliminary WWTF Improvements
E Ohio St. Extending South of Highway 20, Webster City, Iowa
Location: Boring No. 15

Remarks:
WISCONSINAN SUBGLACIAL TILL

ALLENDER BUTZKE ENGINEERS, INC.

Figure PR-2

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	2.6	4.7	3.7	28.4	33.3	16.2	11.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.3240	0.4169	0.3116	0.1277	0.0072			

MATERIAL DESCRIPTION	USCS	AASHTO
○ Brown silty fine to medium sand, trace gravel		

Project No. 211124 **Client:** City of Webster City

Project: Forcemain & Perliminary WWTF Improvements

E Ohio St. Extending South of Highway 20, Webster City, Iowa

○ **Location:** Boring No. 16 **Depth:** 1' to 12'

Remarks:

○GLACIAL OUTWASH

ALLENDER BUTZKE ENGINEERS, INC.

Figure GS-1

BORING LOG DESCRIPTION/LEGEND

(page 1 of 4)

The material types encountered during the drilling operations were recorded on field logs. The profile represented on the Boring Log is based on final classification performed by a geotechnical engineer using the field logs, laboratory observation and testing. The material stratigraphy demarcation lines shown on the Boring Logs indicate changes in soil characteristics, however, actual soil changes or variations may occur as a gradual transition. Soil profile discussion, Log Boring information, water levels and recommendations presented in this report are based upon measured depths below ground levels existing at time of the field exploration, unless otherwise specified.

DRILLING AND SAMPLING

The borings were conducted with either a truck or all-terrain rotary drill rig using the drilling methods indicated on each Boring Log. Soil sampling and/or in-situ testing such as Shelby Tube (ST), split-spoon (SS), drive cone (DC), or core (C) was conducted at depth intervals which were selected in consideration of the characteristics of the proposed construction. Generally undisturbed soil samples are taken at 5 foot depth intervals or change in soil types. Disturbed soil samples from the auger, either jar size or bulk size samples, may be taken at intermediate intervals for the purpose of soil classification or laboratory testing. Borings conducted for soil classification only, will show no designation of sampling although disturbed sampling is performed. Soil samples obtained in the field were identified and sealed for transportation to the laboratory for performance of pertinent physical testing and engineering classification.

Drilling Methods

CFA - Continuous Flight Auger: 4, 6, or 8-inch diameter (ASTM D1452).
RD - Rotary Drilling: Using drilling fluid in cased or uncased boring (ASTM D2113).
HSA - Hollow Stem Auger: 6 or 8-inch diameter, continuous flight auger remains in boring with soil removed from the hollow stem through which undisturbed sampling is conducted.
HA - Hand Auger: 4-inch or less diameter.

Sample Types

ST - Shelby Tube: Thin-walled tube samples of cohesive soils (ASTM D1587).
SS - Split Spoon with 140 lb. manual hammer: Standard penetration test and split-barrel samples (ASTM D1586).
SSA - Split Spoon with 140 lb. automatic hammer: Standard penetration test and split-barrel samples (ASTM D1586).
DC - Drive Cone: Dynamic in-place testing of soil using a 2-inch diameter cone with a 60 degree point driven into the soil for continuous 1-foot intervals in the same manner as Split Spoon, no sample is obtained.
C - Core: Sampling hard soil or bedrock with a diamond core barrel in a rotary drill boring (ASTM D2113).
SPT - Standard Penetration Test: Number of blows required to drive sampler (split spoon or drive cone) into the soil with a 140-pound weight dropping a distance of 30-inches (ASTM D1586), number of blows recorded for each 6-inch interval in an 18-inch (or more) penetration depth, values shown are for each 6-inch interval (if series of number sets are shown) or a total of the last two 6-inch intervals (if only one number is shown) which is commonly referred to as "N" in blows per foot. High resistance is indicated by a high number of blows for a lesser penetration depth listed in inches.
BS - Bulk Sample: Disturbed.
CPT - Cone Penetration Test: Quasi-static in-place testing of soils using a 60 degree cone and friction sleeve which are steadily pushed into the soil and measure skin friction and end bearing (ASTM D3441).

STANDARD LABORATORY TESTING

Representative undisturbed soil samples obtained by the Shelby Tube sampler were tested for moisture content (ASTM D2216), density (dry) and unconfined compressive strength (ASTM D2166) in the laboratory. Results of these tests appear on the respective Boring Logs. Additional soil testing including particle size analysis (ASTM D422) and Atterberg Limits (ASTM D4318) may be conducted, if necessary, to define in more detail pertinent soil characteristics for classification in accordance with the Unified Soil Classification System. Specialized laboratory tests (if conducted) to determine pertinent soil characteristics are discussed in the "Laboratory Testing" section of the report.

WATER LEVEL MEASUREMENT

Water levels indicated on the Boring Logs are the levels measured in the borings at the times indicated. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels is not possible with short term observations.

BORING LOG DESCRIPTION/LEGEND

(page 2 of 4)

DESCRIPTIVE SOIL CLASSIFICATION

Soil description is based on the Unified Classification System as outlined in ASTM Designations D-2487 and D-2488. This classification is primarily based upon visual and apparent physical soil characteristics, comparison with other soil samples, and our experience with the soil. Additional laboratory testing may be conducted, if necessary to define in more detail pertinent soil characteristics. The Unified Soil Classification group symbol shown on the boring logs corresponds with the group names listed below. The description includes soil constituents, moisture conditions, color and any other appropriate descriptive terms.

Group Symbol	Group Name	Group Symbol	Group Name	Group Symbol	Group Name	Group Symbol	Group Name
GW	Well-Graded Gravel	SW	Well-Graded Sand	CL	Lean Clay	CH	Fat Clay
GP	Poorly-Graded Gravel	SP	Poorly-Graded Sand	ML	Silt	MH	Elastic Silt
GM	Silty Gravel	SM	Silty Sand	OL	Organic Clay Organic Silt	OH	Organic Clay Organic Silt
GC	Clayey Gravel	SC	Clayey Sand			PT	Peat

RELATIVE PROPORTIONS			GRAIN SIZE TERMINOLOGY	
Descriptive Term(s) (Of components also present in sample)	Sand and Gravel % of Dry Weight	Fines % of Dry Weight	Major Component of Sample	Size Range
Trace	<15	<5	Cobbles	12 in. to 3 in. (300mm to 75mm)
With	15-30	5-12	Gravel	3 in. to #4 sieve (75mm to 4.75mm)
Modifier	>30	>12	Sand	#4 to #200 sieve (4.75mm to 0.074mm)
			Silt or Clay	Passing #200 sieve (.074 mm)

CONSISTENCY OF FINE-GRAINED SOILS			RELATIVE DENSITY OF COARSE-GRAINED SOILS	
Unconfined Compressive Strength, Qu, psf	Consistency	SPT, bpf	SPT, bpf	Relative Density
< 500	Very Soft	0-2	0-4	Very Loose
500-1,000	Soft	2-4	4-10	Loose
1,000-2,000	Medium Stiff	4-8	10-30	Medium Dense
2,000-4,000	Stiff	8-15	30-50	Dense
4,000-8,000	Very Stiff	15-30	50-80	Very Dense
8,000-16,000	Hard	30-100	80+	Extremely Dense
> 16,000	Very Hard	>100		

BORING LOG DESCRIPTION/LEGEND
(page 3 of 4)

ABBREVIATIONS

COMMONLY USED ABBREVIATIONS	
ft. or ' - feet	elev. - Elevation
in. or " - inches	% - Percent
psf - pounds per square foot	No. - Number
plf - pound per lineal foot	TB - Test Boring
pcf - pounds per cubic feet	N - blow count (SPT, bpf)
kip - 1000 pounds	USCS - Unified Soil Classification System
ksf - 1000 pounds per square foot	LL - Liquid Limit
klf - 1000 pounds per lineal foot	PL - Plastic Limit
tsf - tons per square foot	PI - Plasticity Index
bpf - blows per foot (SPT, N)	

BORING LOG DESCRIPTION/LEGEND

(page 4 of 4)

BEDROCK

CLASSIFICATION	
LIMESTONE	Light to dark colored, crystalline to fine-grained texture, composed of $CaCO_3$, reacts with HCl.
DOLOMITE	Light to dark colored, crystalline to fine-grained texture, composed of $MgCO_3$, slightly harder than limestone, reacts with HCl when powdered.
CHERT	Light to dark colored, smooth, very fine-grained texture, composed of micro-crystalline quartz (SiO_2), brittle, breaks into angular fragments, will scratch glass.
SANDSTONE	Usually light colored, coarse to fine texture, composed of cemented sand-sized grains of quartz, feldspar, etc.
SHALE	Light to dark colored, very fine-grained texture, composed of consolidated mud, silt, or clay, usually bedded in thin layers. The unlaminated equivalent is frequently referred to as siltstone, claystone, or mudstone.
COAL	Usually black graphite-like material composed of carbonaceous matter (decomposed organics) and clay, brittle.

Rock Quality Designation, RQD is based on a modified core recovery procedure which, in turn, is based indirectly on the number of fractures and amount of softening or alteration in the rock mass as observed in the rock cores from a drill hole. Instead of counting the fractures, an indirect measure is obtained by summing up the total length of core recovered but counting only those pieces of core which are 4 inches in length or longer, and which are hard and sound.

ROCK QUALITY DESIGNATION (RQD)

RQD	Description of Rock Quality
0 – 25	Very Poor
25 – 50	Poor
50 – 75	Fair
75 – 90	Good
90 – 100	Excellent

BORING LOG NO. 1 **NORTHING** 8574311 **EASTING** 14777246

Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1015.6'
Datum: Site Survey
Date Drilled: 2/17/2021
Drilling Depth, ft.: 15
Drilling Method: 4" CFA
Page: 1 of 1

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	USCS	Water Level	Depth / Elevation ft.
	0							CRUSHED ROCK WITH FINES (6"±)			0.5 / 1015.1
1014								Dark brown very sandy lean clay, moist COHESIVE ALLUVIUM	CL		2 / 1013.6
								Brown silty fine to medium sand, moist	SP-SM		
		1	SSA	5	5.8						
1008	6										
		2	SSA	5	10.3			GRANULAR ALLUVIUM			
								Trace gravel 10' to 12'			
	12							Saturated after 12'			
1002								Brown medium to coarse sand with clay after 13'	SW-SC	▽	
		3	SSA	25				Gravel with sand, trace clay after 14'	GP		15 / 1000.6
								End of Boring			
996	18										
990	24										
984	30										
978	36										

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 13 ft. ▽ ____ ft. ▼ ____ ft. ▼

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Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 2 NORTHING 8574317 EASTING 14777765

Project No.: 211124

Project:	Forcemain & Preliminary WWTF Imps. E Ohio St. Extending South of Highway 20 Webster City, Iowa	Client:	City of Webster City 400 2nd Street, P.O. Box 217 Webster City, Iowa 50595
Surface Elevation:	1015.9'	Date Drilled:	2/17/2021
Datum:	Site Survey	Drilling Depth, ft.:	15
Drilling Method:	4" CFA	Page:	1 of 1

Elevation ft. scale: 1014, 1008, 1002, 996, 990, 984, 978
Depth ft. scale: 0, 6, 12, 18, 24, 30, 36

Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf
1	SSA	7	14.3		
2	SSA	6	7.7		
3	SSA	9	8.0		

Material Description*	USCS	Water Level	Depth / Elevation ft.
Dark brown very sandy lean clay, moist	CL		
Gray silty fine to medium sand, trace gravel, damp after 0.5' **FILL**	SP		1.5 / 1014.4
Dark brown silty fine to medium sand, moist Brown, trace gravel after 4'	SP-SM		
With clay seams from 7' to 8.5'	CL		
GRANULAR ALLUVIUM Brown-light brown fine to medium sand with silt after 8.5' Brown with gravel 10 to 11.5'	SP-SM		
Sandy clay seams from 11.5' to 12.5'	CL		
Gray medium to coarse sand with silt, trace gravel after 12.5' Saturated after 14.8'	SW-SM	▽	15 / 1000.9
End of Boring			

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time:	at completion	___ hrs.	___ days
Depth to water:	14.8 ft. ▽	___ ft.	___ ft.

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 3 **NORTHING** 8574261 **EASTING** 14778501

Project No.: **211124**

Project: **Forcemain & Preliminary WWTF Imps.**
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: **City of Webster City**
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: **1012.9'**
Datum: **Site Survey**
Date Drilled: **2/17/2021**
Drilling Depth, ft.: **15**
Drilling Method: **4" CFA**
Page: **1** of **1**

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	Graphic Log	USCS	Water Level	Depth / Elevation ft.
	0							Dark brown lean clay, trace organics, very moist **TOPSOIL**		CL		2
								Brown-light brown fine to medium sand with silt, damp to moist		SP-SM		1010.9
		1	SSA	6	5.3							
1008	6							**GRANULAR ALLUVIUM**				9
		2	SSA	3	7.2 23.3			Gray-brown lean clay, trace sand, very moist		CL		1003.9
1002	12							**COHESIVE ALLUVIUM** Dark gray very sandy lean clay after 11.5'			▽	14
		3	SSA	14	10.6			Gravel with sand, trace clay, saturated **GRANULAR ALLUVIUM**		GP		998.9 15
								End of Boring				997.9
996	18											
990	24											
984	30											
978	36											
972												

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 13 ft. ▽ ____ ft. ____ ft.

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 4 **NORTHING** 8573501 **EASTING** 14778509

Project No.: 211124

Project: **Forcemain & Preliminary WWTF Imps.**
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: **City of Webster City**
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: **1017.3'**
Datum: **Site Survey**
Date Drilled: **2/17/2021**
Drilling Depth, ft.: **15**
Drilling Method: **4" CFA**
Page: **1** of **1**

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	USCS	Water Level	Depth / Elevation ft.
	0							Dark brown silty sand, moist to very moist	SM		
								Dark brown clayey sand after 1.5	SC		
1014		1	SSA	5	12.5			Brown after 5' **GRANULAR ALLUVIUM**			
	6										8.5 / 1008.8
1008		2	SSA	9	22.1			Brown trace gray sandy lean clay, very moist **COHESIVE ALLUVIUM**	CL		10.5 / 1006.8
								Brown silty fine to medium sand, saturated	SP-SM		
	12							Brown clayey medium to coarse sand, trace gravel after 12'	SW-SC	▽	
		3	SSA	12				**GRANULAR ALLUVIUM** Gravel with sand and clay after 14'	GP		15 / 1002.3
1002								End of Boring			
	18										
996											
	24										
990											
	30										
984											
	36										
978											

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 12 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 5 **NORTHING** 8573073 **EASTING** 14778329

Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1013.0'
Datum: Site Survey

Date Drilled: 2/17/2021
Drilling Depth, ft.: 15

Drilling Method: 4" CFA
Page: 1 of 1

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	USCS	Water Level	Depth / Elevation ft.
	0							Dark brown sandy lean clay, trace gravel and organics, very moist **TOPSOIL**	CL		1.5 / 1011.5
								Very dark brown sandy lean clay, moist **COHESIVE ALLUVIUM**	CL		3.5 / 1009.5
1008	6	1	SSA	4				Gray clayey fine to medium sand, saturated **GRANULAR ALLUVIUM**	SP-SC		6.5 / 1006.5
		2	SSA	2	36.8			Gray lean clay, trace sand, very moist	CL	▽	
1002	12							Saturated clayey sand seam 10' to 11' **COHESIVE ALLUVIUM**			
								Dark gray lean clay with sand, very moist	CL		
		3	SSA	22	34.2			Sandy after 13.5'			15 / 998
996	18							End of Boring			
990	24										
984	30										
978	36										
972											

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 8 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 6	NORTHING 8572300	EASTING 14778322	Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1053.7'
Datum: Site Survey
Date Drilled: 2/17/2021
Drilling Depth, ft.: 30
Drilling Method: 4" CFA
Page: 1 of 1

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	USCS	Water Level	Depth / Elevation ft.
	0							Dark brown sandy lean clay, trace organics, moist **TOPSOIL**	CL		1 / 1052.7
1050		1	ST		21.1	103	5140	Dark brown to brown sandy lean clay, trace gravel, moist	CL		
	6							Sand seam near 5.5'			
								WISCONSINAN SUPRAGLACIAL TILL			
1044		2	ST		17.4	106	2520	Brown-gray after 10'			
	12										
		3	ST		18.7	106	2340				15 / 1038.7
1038								Dark gray sandy lean clay, trace gravel, moist	CL		
	18							**WISCONSINAN SUBGLACIAL TILL**			
		4	ST		19.8	104	2230				
1032								Very sandy and very moist after 21'			22 / 1031.7
								Brown coarse sand with gravel, saturated	SP		
	24	5	SSA	45				**GLACIAL OUTWASH** With large limestone pieces after 24'		▽	26 / 1027.7
1026								Dark gray sandy lean clay with limestone fragments, damp **WISCONSINAN SUBGLACIAL TILL**	CL		
		6	SSA	75	10.9						30 / 1023.7
	30							End of Boring			
1020											
	36										
1014											

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation
Time: at completion ____ hrs. ____ days
Depth to water: 25 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.
Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 7	NORTHING 8571847	EASTING 14779063	Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1051.8'
Datum: Site Survey
Date Drilled: 2/18/2021
Drilling Depth, ft.: 30
Drilling Method: 4" CFA
Page: 1 of 1

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	USCS	Water Level	Depth / Elevation ft.
1050	0							Dark brown sandy lean clay, trace gravel, moist **FILL** Very dark brown and brown mixed after 2'	CL		4
		1	SSA	8	16.5			Brown-gray sandy lean clay, trace gravel, moist **WISCONSINAN SUPRAGLACIAL TILL** With interbedded sand seams after 10'	CL		1047.8
1044	6	2	ST		19.9	101	1970				
1038	12	3	ST		18.0	105	4660				15.5
								Brown silty fine to medium sand, saturated **GLACIAL OUTWASH**	SP-SM		1036.3 19.3
1032	18	4	SSA	17	18.7			Dark gray sandy lean clay, trace gravel, moist Moisture seepage near 21.5' **WISCONSINAN SUBGLACIAL TILL** Hard to very hard and damp after 23.5'	CL	▽	1032.5
	24	5	ST		12.1	123	15,260				25
1026								Gray silty fine to medium sand, trace gravel, saturated **GLACIAL OUTWASH** Large gravel/cobbles near 28'	SP-SM		1026.8 29
1020	30	6	SSA	84	10.2			Dark gray sandy lean clay, trace gravel, damp **WISCONSINAN SUBGLACIAL TILL**	CL		1022.8 30
1014	36							End of Boring			1021.8

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 23 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 8	NORTHING 8571284	EASTING 14779522	Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps. E Ohio St. Extending South of Highway 20 Webster City, Iowa	Client: City of Webster City 400 2nd Street, P.O. Box 217 Webster City, Iowa 50595	
Surface Elevation: 1050.8' Datum: Site Survey	Date Drilled: 2/18/2021 Drilling Depth, ft.: 39.1	Drilling Method: 4" CFA/HSA Page: 1 of 1

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	USCS	Water Level	Depth / Elevation ft.
1050	0							Dark brown clayey sand, trace gravel, moist **FILL** Brown silty medium to coarse sand with gravel after 2'	SC SW-SM		3.5 1047.3
		1	SSA	9	18.6			Brown-gray sandy lean clay, trace gravel, moist	CL		
1044	6							Very sandy with gravel after 7.5' **WISCONSINAN SUPRAGLACIAL TILL**			
		2	SSA	23	19.4						
1038	12										14 1036.8
		3	SSA	20	17.1			Dark gray sandy lean clay, trace gravel, moist	CL		
1032	18							**WISCONSINAN SUBGLACIAL TILL**			
		4	SSA	13	20.1						22 1028.8
								Silty fine to medium sand, trace gravel, moist Moisture seepage near and saturated after 24' **GLACIAL OUTWASH**	SP-SM	▽	
1026	24	5	SSA	41							
								Boulder encountered near 28.5'			29 1021.8
1020	30	6	SSA	100	7.4			Yellow fractured limestone, damp **WEATHERED BEDROCK**			30 1020.8
								Yellow limestone, damp **BEDROCK**			
1014	36	7	SSA	94	10.2			Gray-brown sandstone, moist after 35.5' Yellow limestone, damp after 38.5'			39.1 1011.7
		8	SSA	50/1"				End of Boring			

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation			
Time:	at completion	____ hrs.	____ days
Depth to water:	24 ft. ▽	____ ft.	____ ft.

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 9	**NORTHING** 8570759	**EASTING** 14779771	Project No.: **211124**

Project: **Forcemain & Preliminary WWTF Imps.** **E Ohio St. Extending South of Highway 20** **Webster City, Iowa**	Client: **City of Webster City** **400 2nd Street, P.O. Box 217** **Webster City, Iowa 50595**	
Surface Elevation: **1045.6'** Datum: **Site Survey**	Date Drilled: **N/A** Drilling Depth, ft.: **40**	Drilling Method: **N/A** Page: **1** of **1**

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	Graphic Log	USCS	Water Level	Depth / Elevation ft.
	0											
1044												
	6											
1038												
	12											
1032												
	18							**After discussion with Bolton & Menk, Boring No. 9 was removed from the geotechnical scope due to the shallow depth of limestone bedrock encountered in Boring No. 8 resulting in unlikely forcemain crossing at this location**				
1026												
	24											
1020												
	30											
1014												
	36											
1008												
								End of Boring				40 1005.6

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: ____ ft. ____ ft. ____ ft.

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 10 **NORTHING** 8570753 **EASTING** 14779454 | Project No.: 211124

Project: **Forcemain & Preliminary WWTF Imps.**
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: **City of Webster City**
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: **1052.4'**
Datum: **Site Survey**
Date Drilled: **2/22/2021**
Drilling Depth, ft.: **29.2**
Drilling Method: **4" CFA**
Page: **1** of **1**

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	Graphic Log	USCS	Water Level	Depth / Elevation ft.
	0							Dark brown sandy lean clay, moist		CL		
1050								Brown very sandy clay with gravel and concrete pieces, moist after 2.5'				
		1	SSA	7				**FILL**				5.5
	6							Brown sandy lean clay, trace gravel after 3.5'				
								Brown-gray sandy lean clay, trace gravel, moist		CL		1046.9
1044								**WISCONSINAN SUPRAGLACIAL TILL**				
		2	ST		19.7	104	3360					10.5
								Dark gray sandy lean clay, trace gravel, moist		CL		1041.9
	12							Moisture seepage near 13'				
1038		3	ST		18.1	107	3750					
								WISCONSINAN SUBGLACIAL TILL				
	18							Gray silty fine to medium sand seam 18.5' to 19.5'				
1032		4	SSA	27	14.7							22
								Gray clayey fine to coarse sand with gravel, saturated		SC		1030.4
	24	5	SSA	30				**GLACIAL OUTWASH**			▽	25.5
1026								Yellow fractured limestone. moist **WEATHERED BEDROCK**				1026.9 / 27
								Yellow limestone. damp **BEDROCK**				1025.4 / 29.2
	30	6	SSA	50/ 0.25"				End of Boring				1023.2
1020												
	36											
1014												

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 24 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 11 **NORTHING** 8570170 **EASTING** 14779664 | Project No.: 211124

Project: **Forcemain & Preliminary WWTF Imps.**
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: **City of Webster City**
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: **1050.0'**
Datum: **Site Survey**
Date Drilled: **3/2/2021**
Drilling Depth, ft.: **15**
Drilling Method: **4" CFA**
Page: **1** of **1**

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	USCS	Water Level	Depth / Elevation ft.
	0							Dark brown sandy lean clay, trace gravel, very moist **FILL**	CL		3
		1	SSA	7	5.8			Brown fine to medium sand with clay, damp Brown fine to medium sand, trace gravel after 3.5' **GLACIAL OUTWASH** Brown fine to coarse sand with silt after 6'	SP-SC SP SW-SM		1047 7
1044	6										
		2	SSA	31	20.0			Brown sandy lean clay, trace gravel, moist **WISCONSINAN SUPRAGLACIAL TILL** Brown-gray after 9'	CL		1043 10.5
1038	12							Dark gray sandy lean clay, trace gravel, moist Saturated silty sand seam 12' to 13.5' **WISCONSINAN SUBGLACIAL TILL**	CL	▽	1039.5
		3	ST		20.3	104	1560				15
								End of Boring			1035
1032	18										
1026	24										
1020	30										
1014	36										

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 12 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 12 **NORTHING** 8569550 **EASTING** 14779889 | Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1041.9'
Datum: Site Survey
Date Drilled: 3/2/2021
Drilling Depth, ft.: 18.6
Drilling Method: 4" CFA
Page: 1 of 1

Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf
	1	SSA	6	20.1		
	2	SSA	7	22.6		
	3	ST		19.8	103	3460
	4	ST		16.9	109	3310
	5	SSA	120			
	6	SSA	50/1"			

Elevation ft. scale: 1038, 1032, 1026, 1020, 1014, 1008, 1002
Depth ft. scale: 0, 6, 12, 18, 24, 30, 36

Material Description*	USCS	Water Level	Depth / Elevation ft.
Very dark brown sandy lean to fat clay, very moist Moisture seepage near surface **FILL**	CL-CH CL		3
Dark gray and brown mixed sandy lean clay, trace gravel, very moist after 2' Brown-gray sandy lean clay, trace gravel, moist **WISCONSINAN SUPRAGLACIAL TILL** Dark gray silty clay seam, very moist 10' to 11'	CL	▽	1038.9 11
Dark gray sandy lean clay, trace gravel, moist **WISCONSINAN SUBGLACIAL TILL** Sand with gravel after 13'	CL		1030.9 14
Yellow limestone, moist to damp **BEDROCK**			1027.9 18.6
End of Boring			1023.3

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 5 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 13

NORTHING 8569082 **EASTING** 14779889

Project No.: 211124

Project: **Forcemain & Preliminary WWTF Imps.**
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: **City of Webster City**
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: **1036.5'**
Datum: **Site Survey**
Date Drilled: **3/2/2021**
Drilling Depth, ft.: **14.1**
Drilling Method: **4" CFA**
Page: **1** of **1**

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	Graphic Log	USCS	Water Level	Depth / Elevation ft.
	0							Very dark brown sandy lean clay, very moist **TOPSOIL**		CL		1 / 1035.5
		1	SSA	7	18.7			Dark brown sandy lean clay, trace gravel, very moist		CL		
1032		2	SSA	7	23.9			Brown-gray, moist after 4' **WISCONSINAN SUPRAGLACIAL TILL**				
	6	3	ST		22.5	104	4000**	Very sandy after 6'			▽	8.3 / 1028.2
		4	SSA	16				Gray clayey fine to medium sand, saturated **GLACIAL OUTWASH**		SP-SC		10 / 1026.5
1026		6	SSA	50/1"				Yellow limestone, damp **BEDROCK**				
	12											14.1 / 1022.4
		5	SSA	50/0.2"				End of Boring **Estimated using calibrated hand penetrometer				
1020	18											
1014	24											
1008	30											
1002	36											
996												

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 6 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 14 — NORTHING 8569353 — EASTING 14779392

Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1048.0'
Datum: Site Survey
Date Drilled: 3/2/2021
Drilling Depth, ft.: 30.5
Drilling Method: 4" CFA
Page: 1 of 1

Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf
1	SSA	7	29.0		
2	SSA	12	10.6		
3	SSA	16	20.5		
4	SSA	18	17.3 23.1		
5	SSA	13	17.3		
6	SSA	8	14.5		
7	SSA	12	32.7		
8	SSA	62	14.4		

Elevation scale (ft.): 1044, 1038, 1032, 1026, 1020, 1014, 1008
Depth scale (ft.): 0, 6, 12, 18, 24, 30, 36

Material Description*	USCS	Water Level	Depth / Elevation ft.
Very dark brown sandy lean clay, very moist **TOPSOIL**	CL		1 / 1047
Dark brown very sandy clay, trace gravel, very moist **WISCONSINAN SUPRAGLACIAL TILL**	CL		3 / 1045
Brown clayey sand, saturated after 3' Light brown fine to medium sand after 4' **GLACIAL OUTWASH**	SP-SC SP		5.5 7.5 / 1042.5
Brown-gray sandy to very sandy clay, trace gravel, moist **WISCONSINAN SUPRAGLACIAL TILL**	CL		1040.5
Dark gray sandy lean clay, trace gravel, moist Gray clayey sand seam 12.5' to 13.5' **WISCONSINAN SUBGLACIAL TILL**	CL	▽	21 / 1027
Dark gray, gray, and light brown clay shale, moist Yellow fractured limestone, damp after 25.5' **WEATHERED BEDROCK**			30.5 / 1017.5
End of Boring			

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days
Depth to water: 10 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.
Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 15 **NORTHING** 8569547 **EASTING** 14778888 | Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1052.1'
Datum: Site Survey
Date Drilled: 2/22/2021
Drilling Depth, ft.: 27.2
Drilling Method: 4" CFA
Page: 1 of 1

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	USCS	Water Level	Depth / Elevation ft.
	0							Very dark brown lean clay with sand, trace organics, moist **TOPSOIL**	CL		1.5 / 1050.6
1050		1	SSA	15	20.7						
		2	SSA	11	21.5			Dark brown sandy lean clay, trace gravel, moist Brown-gray with interbedded sand seams throughout after 3. 5' **WISCONSINAN SUPRAGLACIAL TILL**	CL		9 / 1043.1
	6	3	ST		18.9	105	5060				
1044		4	ST		18.0	106	5240				
								Dark gray sandy lean clay, trace gravel, moist **WISCONSINAN SUBGLACIAL TILL**	CL	▼ (10.5)	17.5 / 1034.6
	12										
1038		5	ST		17.8	108	4050				
	18							Gray clayey fine to coarse sand with gravel, saturated **GLACIAL OUTWASH**	SW-SC	▽ (18)	19.7 / 1032.4
		6	SSA	40							
1032								Dark gray sandy lean clay, trace gravel, moist with sand seams throughout **WISCONSINAN SUBGLACIAL TILL**	CL		24.8 / 1027.3
	24	7	SSA	74	13.3						
1026								Light gray limestone, damp **BEDROCK** Light brown after 26'			27.2 / 1024.9
		8	SSA	50/ 0.25"				End of Boring			
	30										
1020											
	36										
1014											

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time:	at completion	___ hrs.	7 days
Depth to water:	18 ft. ▽	___ ft. ▼	10.5 ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.
Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 16 NORTHING 8569085 EASTING 14778884

Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1051.0'
Datum: Site Survey
Date Drilled: 2/22/2021
Drilling Depth, ft.: 29.8
Drilling Method: 4" CFA
Page: 1 of 1

Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf
	1	SSA	25	11.7		
	2	SSA	9	12.2		
	3	SSA	11	9.6		
	4	SSA	26	15.3		
	5	SSA	31	13.8		
	6	SSA	56	11.3		
	7	SSA	171			
	8	SSA	200			

Material Description*	USCS	Depth ft. / Elevation ft.
Dark brown sandy lean clay, trace organics, moist **TOPSOIL**	CL	1 / 1050
Brown clayey sand, trace gravel, damp	SC	
Brown silty fine to medium sand, trace gravel, damp after 2.5' **GLACIAL OUTWASH** Moist after 8.5' Saturated after 11'	SP-SM	12.5 / 1038.5
Dark gray sandy lean clay, trace gravel, moist with sand seams throughout Very moist near 17' **WISCONSINAN SUBGLACIAL TILL** Saturated sand after 22'	CL	23 / 1028
Yellow fractured limestone, moist **WEATHERED BEDROCK**		23.5 / 1027.5
Yellow limestone, damp **BEDROCK**		29.8 / 1021.2
End of Boring		

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ___ hrs. 7 days

Depth to water: 12.2 ft. ___ ft. 10.5 ft.

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 17	NORTHING 8571702	EASTING 14778958	Project No.: 211124

Project:	Forcemain & Preliminary WWTF Imps. E Ohio St. Extending South of Highway 20 Webster City, Iowa
Client:	City of Webster City 400 2nd Street, P.O. Box 217 Webster City, Iowa 50595
Surface Elevation:	1052.7'
Datum:	Site Survey
Date Drilled:	2/18/2021
Drilling Depth, ft.:	30
Drilling Method:	4" CFA
Page:	1 of 1

Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf
1	SSA	7	13.2		
2	ST		17.8	105	3550
3	SSA	23	18.4		
4	ST		18.3	110	3700
5	SSA	31	11.0		
6	SSA	31			

Material Description*	USCS	Depth / Elevation ft.
Dark brown sandy lean clay, trace gravel, moist **FILL**	CL	3.5 / 1049.2
Brown-gray sandy lean clay, trace gravel, moist **WISCONSINAN SUPRAGLACIAL TILL** With interbedded sand seams after 11.5'	CL	15.5 / 1037.2
Dark gray sandy lean clay, trace gravel, moist With interbedded sand seams throughout after 19.7' **WISCONSINAN SUBGLACIAL TILL** Moisture seepage near 23'	CL	26 / 1026.7
Gray silty fine to medium sand, saturated **GLACIAL OUTWASH**	SP-SM	30 / 1022.7
End of Boring		

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days

Depth to water: 20 ft. ____ ft. ____ ft.

ALLENDER BUTZKE ENGINEERS, INC.

Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 18	NORTHING 8571337	EASTING 14778836	Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1050.3'
Datum: Site Survey
Date Drilled: 3/2/2021
Drilling Depth, ft.: 27.2
Drilling Method: 4" CFA
Page: 1 of 1

Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf	Material Description*	USCS	Water Level	Depth / Elevation ft.
1050	0							Dark brown sandy lean clay, trace gravel, moist **FILL**	CL		4 1046.3
		1	ST		17.0	101	2450	Brown-gray sandy lean clay, trace gravel, moist **WISCONSINAN SUPRAGLACIAL TILL**	CL		13 1037.3
1044	6	2	SSA	3	19.9						
1038	12	3	ST				3000**	Dark gray sandy lean clay, trace gravel, moist **WISCONSINAN SUBGLACIAL TILL**	CL		15.5 1034.8
1032	18	4	SSA	23				Brown clayey medium to coarse sand with gravel, saturated **GLACIAL OUTWASH** Clay seam 21' to 22'	SC	▽	24.8 1025.5
1026	24	5	SSA	55				Yellow fractured limestone, moist **WEATHERED BEDROCK**			26 1024.3
		6	SSA	50/0.2"				Yellow limestone, damp **BEDROCK**			27.2 1023.1
1020	30							End of Boring **Estimated using calibrated hand penetrometer			
1014	36										

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation

Time: at completion ____ hrs. ____ days
Depth to water: 16 ft. ▽ ____ ft. ▼ ____ ft. ▼

ALLENDER BUTZKE ENGINEERS, INC.
Geotechnical | Environmental | Construction Q.C.

BORING LOG NO. 19	NORTHING 8570753	EASTING 14778899	Project No.: 211124

Project: Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

Client: City of Webster City
400 2nd Street, P.O. Box 217
Webster City, Iowa 50595

Surface Elevation: 1051.5'±
Datum: Site Survey
Date Drilled: 3/2/2021
Drilling Depth, ft.: 29.2
Drilling Method: 4" CFA
Page: 1 of 1

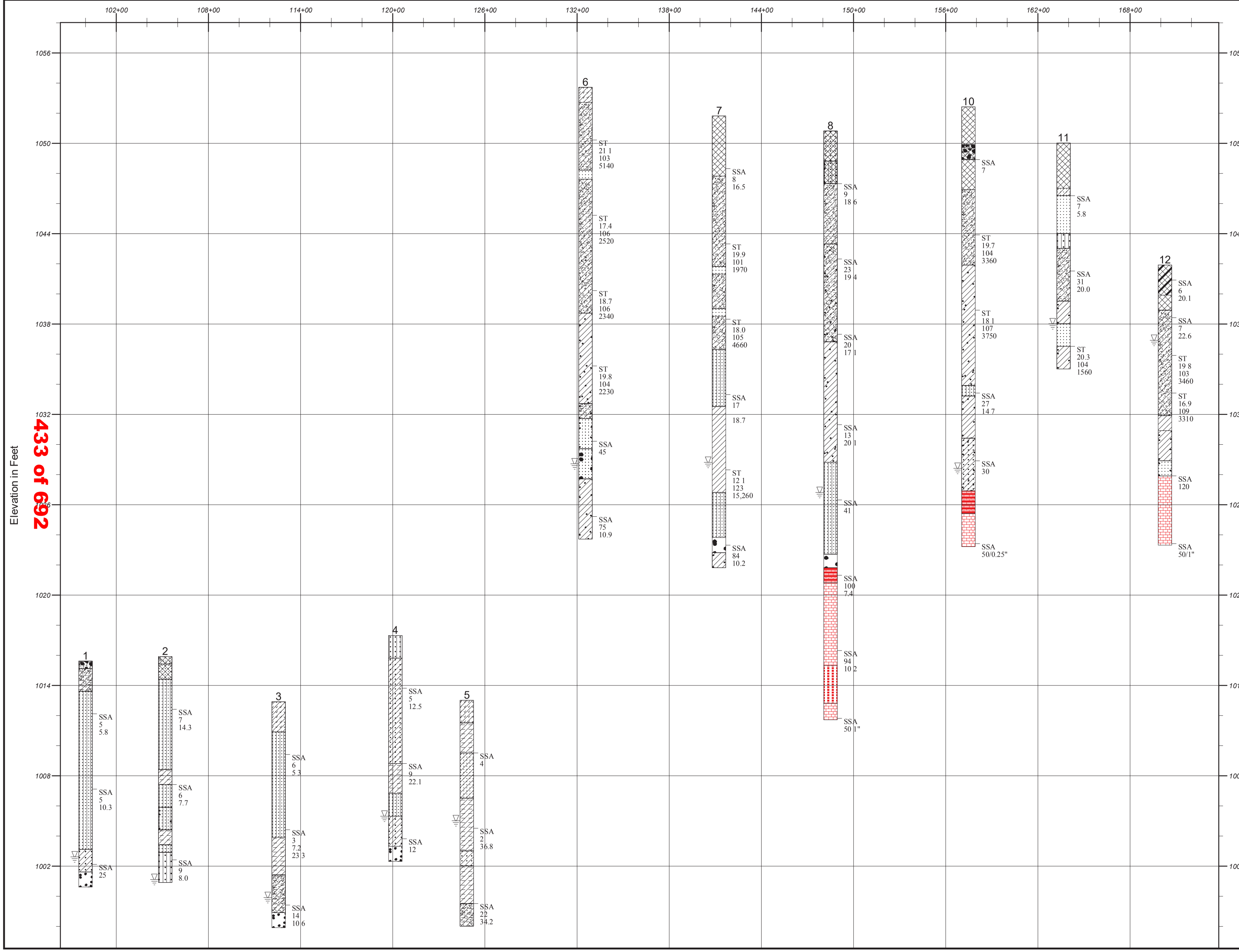
Elevation ft.	Depth ft.	Sample No.	Type	SPT bpf	Moisture Content, %	Dry Density pcf	Unconfined Compressive Strength psf
	0						
1050							
		1	SSA	5	8.8		
	6						
1044							
		2	SSA	19	19.2		
	12						
1038							
		3	SSA	10	20.9		
	18						
1032		4	ST		9.3	114	3070
	24	5	SSA	150		12.2	
1026							
		6	SSA	50/2"			
	30						
1020							
	36						
1014							

Material Description*	Graphic Log	USCS	Water Level	Depth / Elevation ft.
Very dark brown lean to fat clay, trace sand, moist **LOCAL ALLUVIUM**		CL-CH		2 / 1049.5
Brown-gray sandy lean clay, trace gravel, moist **WISCONSINAN SUPRAGLACIAL TILL**		CL		3.5 / 1048
Gray medium to coarse sand with gravel, damp **GLACIAL OUTWASH**		SW		5.5 / 1046
Brown-gray sandy to very sandy lean clay, moist to very moist **WISCONSINAN SUPRAGLACIAL TILL**		CL		8.5 / 1043
Dark gray sandy lean clay, trace gravel, moist **WISCONSINAN SUBGLACIAL TILL** Saturated sand seam 23' to 23.5'		CL	▽	23.5 / 1028
Light gray limestone, moist **BEDROCK**				29.2 / 1022.3
End of Boring				

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation
Time: at completion ______ hrs. ______ days
Depth to water: 9 ft. ▽ ______ ft. ______ ft.

ALLENDER BUTZKE ENGINEERS, INC.
Geotechnical | Environmental | Construction Q.C.



PROFILE OF BORINGS

Profile of Borings Legend

Symbol Description

Strata symbols

- Crushed Rock With Fines
- Alluvial Sandy Lean Clay
- Poorly Graded Sand With Silt
- Well graded Sand With Clay
- Poorly graded gravel
- Sandy Lean Clay Fill
- Sand Fill
- Lean Clay Alluvium
- Poorly Graded Sand With Silt and Gravel
- Well graded sand with silt
- Lean Clay Topsoil
- Silty Sand
- Clayey Sand
- Poorly Graded Sand With Clay
- Sandy Lean Clay
- Poorly Graded Sand
- Sandy Lean Clay with Gravel
- Sandy Lean Clay With Gravel
- Sand with Gravel
- Sand With Boulders
- Lean Clay Fill
- Lean Clay
- Cobbles
- Clayey Sand Fill
- Silty Sand Fill
- Weathered Limestone

ALLENDER BUTZKE ENGINEERS, INC.

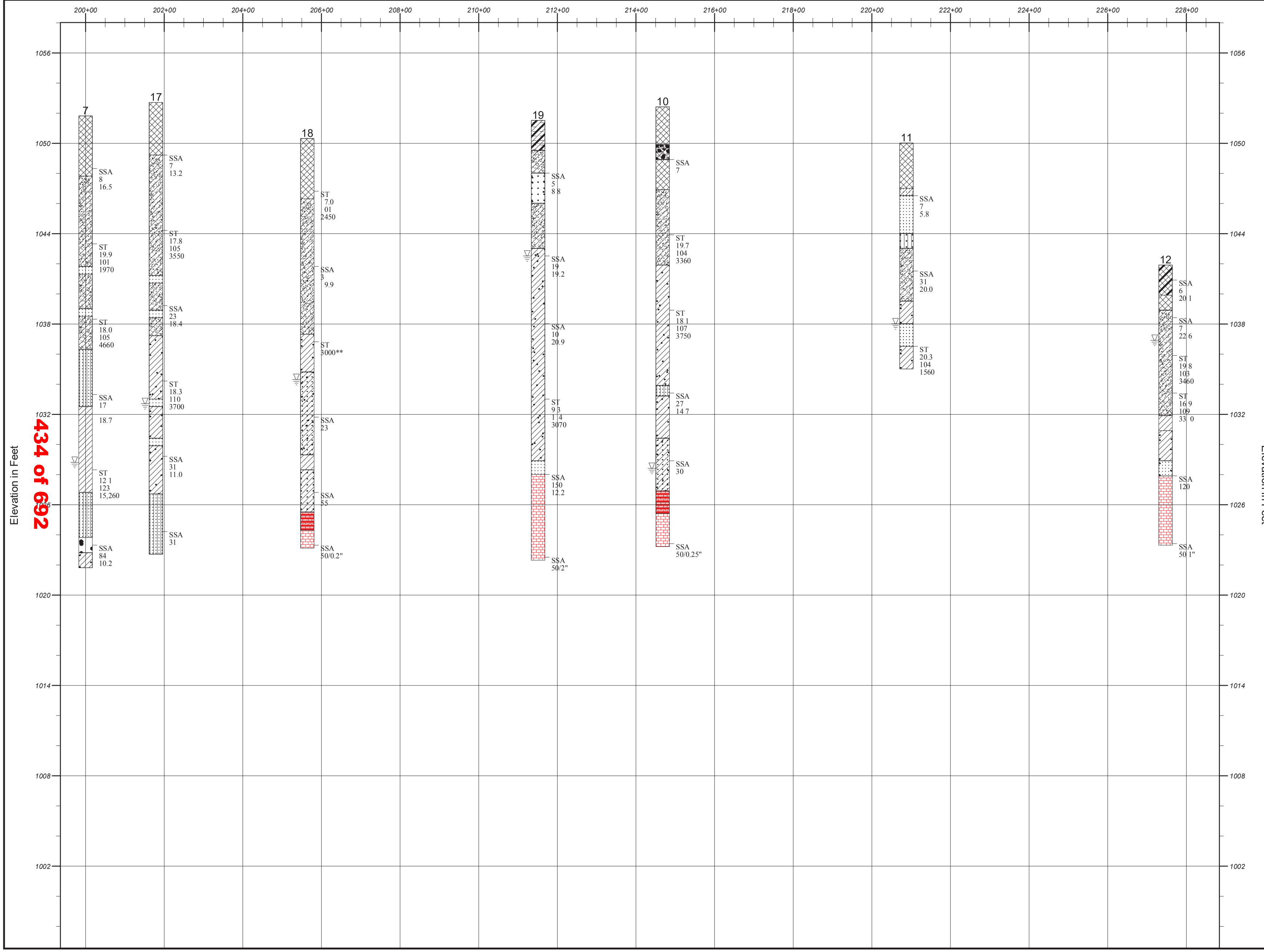
Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

PN 211124

Vertical Scale: 1 inch = 6 feet

Plate: A-1

PROFILE OF BORINGS



Profile of Borings Legend

Symbol Description

Strata symbols

- Lean Clay Fill
- Sandy Lean Clay
- Poorly Graded Sand
- Poorly Graded Sand With Silt
- Lean Clay
- Cobbles
- Sandy Lean Clay with Gravel
- Clayey Sand With Gravel
- Well graded Sand With Clay
- Weathered Limestone
- Limestone
- Lean to Fat Clay Alluvium
- Well Graded Sand With Gravel
- Very Sandy Clay Fill with Concrete
- Poorly Graded Sand With Clay
- Well graded sand with silt
- Lean to Fat Clay Fill
- Sand with Gravel

Misc. Symbols

- Water table at completion

ALLENDER BUTZKE ENGINEERS, INC.

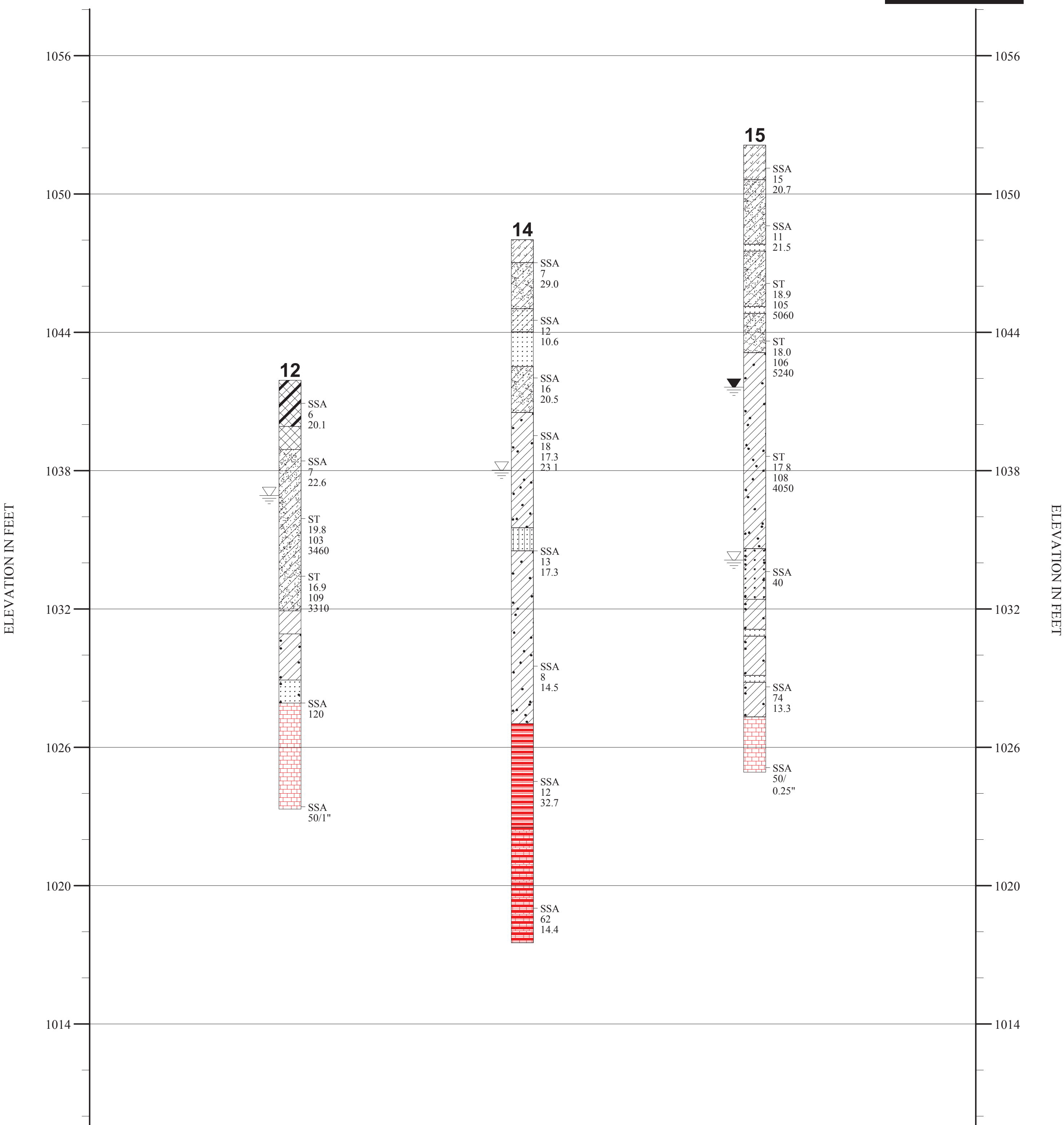
Forcemain & Preliminary WWTF Imps.
E Ohio St. Extending South of Highway 20
Webster City, Iowa

PN 211124

Vertical Scale: 1 inch = 6 feet

Plate: A-2

PROFILE OF BORINGS

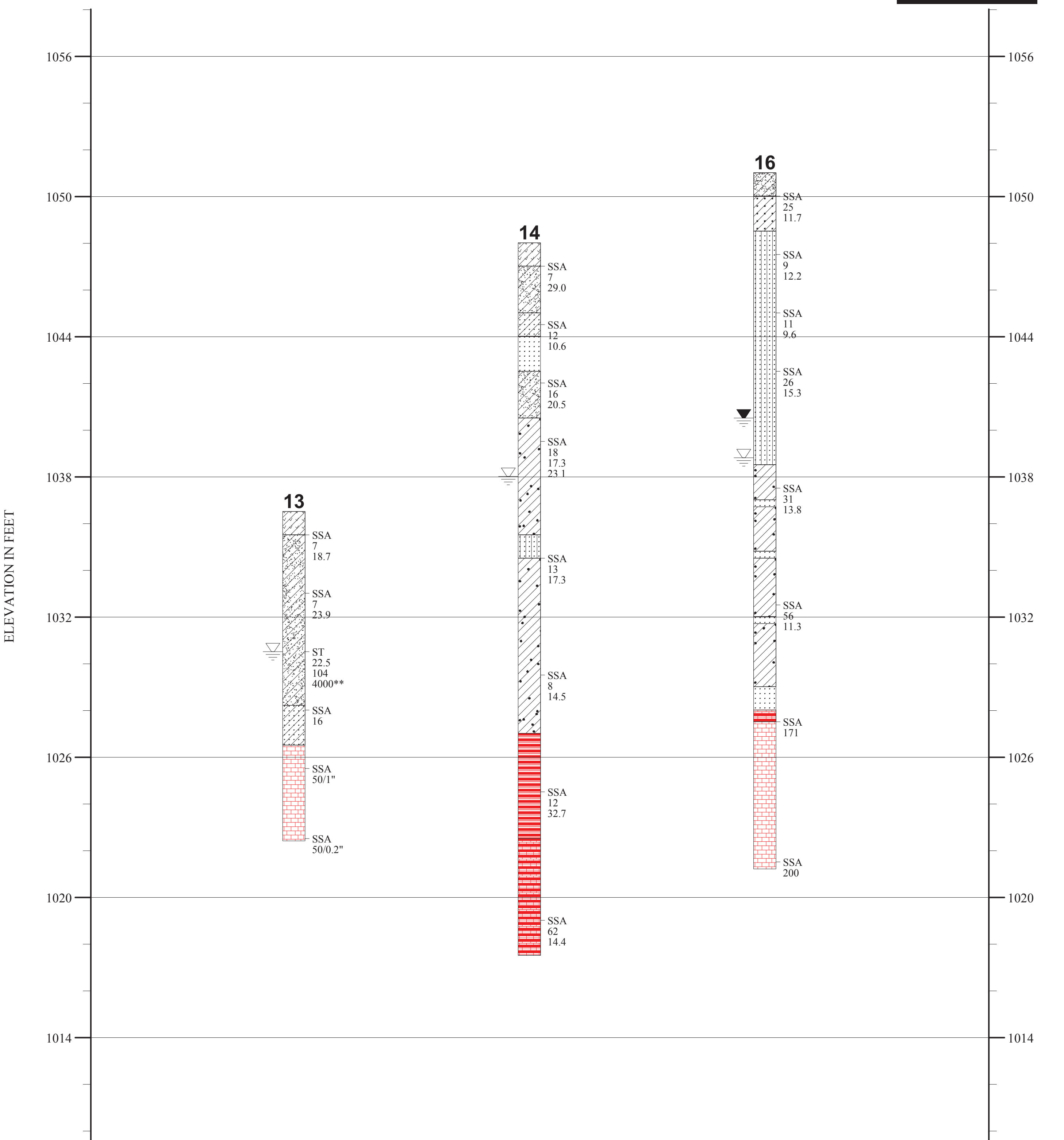


Lean to Fat Clay Fill
Lean Clay Fill
Sandy Lean Clay
Lean Clay
Sandy Lean Clay with Gravel
Poorly Graded Sand With Gravel
Limestone
Lean Clay Topsoil
Poorly Graded Sand With Clay

PROJECT NO.: 211124	DATE: 6/1/2021
PROJECT: Forcemain & Preliminary WWTF Imps. E Ohio St. Extending South of Highway 20 Webster City, Iowa	
PLATE: A-3	SCALE: 6 feet/in.

ALLENDER BUTZKE ENGINEERS, INC.

PROFILE OF BORINGS



Lean Clay Topsoil

Sandy Lean Clay

Poorly Graded Sand With Clay

Limestone

Poorly Graded Sand

Sandy Lean Clay with Gravel

Poorly Graded Sand With Silt

PROJECT NO.: 211124	DATE: 6/1/2021
PROJECT: Forcemain & Preliminary WWTF Imps. E Ohio St. Extending South of Highway 20 Webster City, Iowa	
PLATE: A-4	SCALE: 6 feet/in.

ALLENDER BUTZKE ENGINEERS, INC.


PN 211124
Site Plan
Webster City Forcemain
and Preliminary WWTF
SB1
SB2
SB3
SB4
SB5
SB6
SB7
SB17
SB18
SB8
SB-19
SB-10
SB-09
SB-11
SB-15
SB-12
SB-14
SB-16
SB-13
0
500
1,000
1,500
2,000 ft

NOTES

Appendix L: Design Variance Request

1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

BOLTON & MENK
Real People. Real Solutions.

VIA Email: Satya.Chennupati@idnr.iowa.gov

August 29, 2022

Satya Chennupati, P.E.
Iowa Department of Natural Resources
502 E. 9th Street
Des Moines, IA 50319

RE: City of Webster City Wastewater Treatment Facility Improvements
Bolton & Menk Project No.: A21.119239
DNR No.: S2017-0216
NPDES Permit No.: 406-3001
Variance Request – Wastewater Facility Design Standards

Dear Mr. Chennupati:

A wastewater Facility Plan for the City of Webster City is planned to be submitted to DNR September 2022. The Facility Plan includes a planned variance from state design standards for maximum return activated sludge (RAS) flowrate for an extended aeration activated sludge process as detailed below.

The following information is provided per the IDNR Variance Request Guidance document:

1. Name, address and telephone number of entity requesting variance:
   a. City of Webster City
      Daniel Ortiz-Hernandez, City Manager
      400 Second St
      PO Box 217
      Webster City, IA 50595
      Phone: (515) 832-9151

2. Description of citation or specific rule from which variance is requested:
   a. Wastewater Facility Design Standards Chapter 18B.5.1
      "The minimum permissible return sludge rate of withdrawal from settling tank is a function of the concentration of suspended solids in the mixed liquor entering it, the sludge volume index of these solids and the length of time these solids in the final settling tanks may be deleterious to both the aeration and sedimentation phases of the activated sludge process, the rate of sludge return expressed as a percentage of the AWW design flow of sewage shall be variable between limits of 25 to 100 percent. This requirement shall apply to all activated sludge processes except extended aeration, single stage nitrification and the nitrification stage of separate stage nitrification where the return sludge rate shall be variable from 50 to 150 percent."

3. Specific variance requested, scope, and operative period which the variance will extend:
    a. The requested variance requested is to provide return activated sludge rate variable from 25 to 100 percent for an extended aeration with University of Cape Town (UCT) nutrient removal process for biological nitrogen and phosphorus removal.
    b. Scope of the variance is for all return activated sludge pumps at the Webster City wastewater treatment facility.
    c. The variance will extend from construction through the design life of the proposed wastewater treatment facility improvements.

4. Relevant facts justifying the variance:
    a. Wastewater Facility Design Standards:
        i. The purpose of requiring RAS flow rates of up to 150 percent of influent flow for extended aeration facilities is to provide the ability to rapidly remove sludge from the clarifiers to prevent possible floating solids in the clarifiers due to denitrification (conversion of nitrate to nitrogen gas).
        ii. Plants that do not nitrify are required to have RAS flow rates for 25-100 percent of influent flow.
        iii. Design standards do not address nutrient removal treatment processes that include anoxic basins for nitrate removal.

    b. Proposed Process:
        i. The proposed process includes extended aeration with UCT process for biological nitrogen and phosphorus removal. The inclusion of complete mix anoxic basins and recycle pumping allows for efficient removal of nitrate and thus eliminating concern for floating solids in the clarifiers due to denitrification.

    c. Technical References Supporting Variance Request:
        i. Wastewater Engineering Treatment and Reuse (Metcalf & Eddy) (Fourth Edition) – Table 8-26 Typical design parameters for commonly used biological phosphorus removal processes (page 814). The table states the typical design parameter for UCT process RAS flow rate as percent of influent flow is 80-100 percent.
        ii. Biological Wastewater Treatment (Second Edition) – Excerpt from page 501: "The incorporation of an anoxic zone in the bioreactor can also minimize denitrification problems in the secondary clarifier by reducing nitrate-N concentrations, making it impossible to generate sufficient nitrogen gas to cause sludge flotation."

    d. Economic Impact if Variance is Not Granted:
        i. Clarifier tanks and mechanism would need to be increased to handle additional solids loading due to higher RAS flowrate.
        ii. RAS pump size, horsepower, flowmeter, and valves would need to be increased due to higher RAS flowrate.
        iii. The following pipe sizes would need to be increased due to increased RAS flowrate:
            - From clarifier to RAS pump
            - From RAS pump to control structure at anoxic basin
            - From anoxic basin control structure to anoxic basin
            - From anoxic basin to aeration basin control structure

- From aeration basin control structure to rapid mix basin
- From clarifier control structure to clarifier

iv. The size increase of items listed above results in a significant cost increase to the project with no benefit to the environment or the community of Webster City.

5. Contact history with DNR.
   a. (none)

6. Known department's treatment of similar cases:
   a. City of Perry WWTF – DNR# S2019-0057A – Facility Plan Approved 4/22/20

7. Name, address, and telephone number of any public agency or political subdivision(s) that might be affected by granting the variance:
   a. (none)

8. Name, address, and telephone number of any person or entity that might be affected by granting the variance:
   a. (none)

9. Identify those having knowledge of relevant facts concerning the variance
   a. Daniel Ortiz-Hernandez, City of Webster City
   b. Gregory Sindt, P.E., Bolton & Menk, Inc.
   c. Andrew Sindt, P.E., Bolton & Menk, Inc.

10. Signed release:

I attest to the accuracy of the facts provided in the petition and reason as listed to justify issuance of the variance request.

[signature] 8/29/22

Daniel Ortiz-Hernandez, City Manager for the City of Webster City (Date)

I attest to the accuracy of the facts provided in the petition and reason as listed to justify issuance of the variance request.

LICENSED PROFESSIONAL ENGINEER ANDREW D. SINDT 23193 IOWA	I hereby certify that this engineering document 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 Iowa. [signature] 8/29/22 (Signature) (Date) Printed or typed name: Andrew D. Sindt My license renewal date is: 12-31-2023 Pages or sheets covered by this seal: Entire document

Please contact me with any questions or comments regarding this variance request, phone (515) 233-6100 or email Andrew.Sindt@ bolton-menk.com.

Sincerely,

Bolton & Menk, Inc.

Andrew D. Sindt

Andrew D. Sindt, P.E.
Environmental Engineer

C: James Opelt, Iowa DNR
Daniel Ortiz-Hernandez – City of Webster City
Biridiana Bishop – City of Webster City
Nick Knowles – City of Webster City
Greg Sindt – Bolton & Menk, Inc.

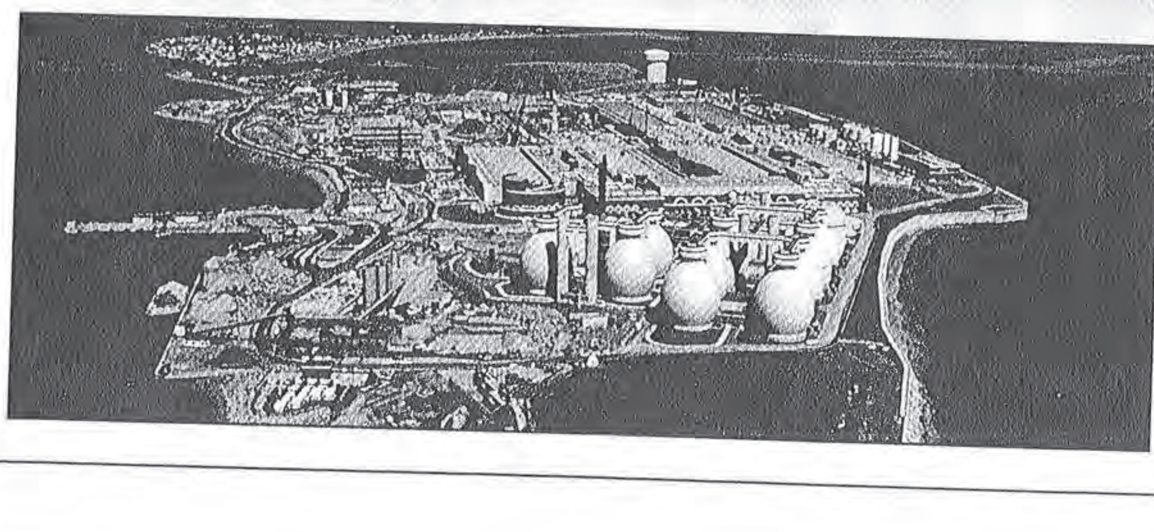
Enclosures:
1. Excerpt from Wastewater Engineering Treatment and Reuse (Metcalf & Eddy) (Second Edition)
2. Excerpt from Biological Wastewater Treatment (Second Edition)

FOURTH EDITION

Wastewater Engineering

Treatment and Reuse

METCALF & EDDY



ble 8–22
›ical design parameters for commonly used nitrogen-removal processes

esign arameter/ rocess	SRT, d[a]	MLSS, mg/L	τ, h Total	Anoxic zone	Aerobic zone	RAS, % of influent	Internal recycle, % of influent
LE	7–20	3000–4000	5–15	1–3	4–12	50–100	100–200
3R	10–30	3000–5000	20–30	Variable	Variable		
ırdenpho (4-stage)	10–20	3000–4000	8–20	1–3 (1st stage) 2–4 (3rd stage)	4–12 (2nd stage) 0.5–1 (4th stage)	50–100	200–400
‹idation ditch	20–30	2000–4000	18–30	Variable	Variable	50–100	
›-denitro™	20–40	3000–4000	20–30	Variable	Variable	50–100	
bal™	10–30	2000–4000	10–20	6–10	3–6 (1st stage) 2–3 (2nd stage)	50–100	Optional

perature-dependent.

e 8–23
›ntages and limitations of nitrogen-removal processes

›cess	Advantages	Limitations
›noxic—eral	Saves energy; BOD is removed before aerobic zone Alkalinity is produced before nitrification Design includes an SVI selector Very adaptable to existing activated-sludge processes 5 to 8 mg/L TN is achievable	Nitrogen-removal capability is a function of internal recycle Potential *Nocardia* growth problem DO control is required before recycle
feed	Adaptable to existing step-feed activated-sludge processes With internal recycle in last pass, nitrogen concentrations less than 5 mg/L are possible 5 to 8 mg/L TN is achievable	Nitrogen-removal capability is a function of flow distribution More complex operation than MLE; requires flow split control to optimize operation Potential *Nocardia* growth problem Requires DO control in each aeration zone

(continued)

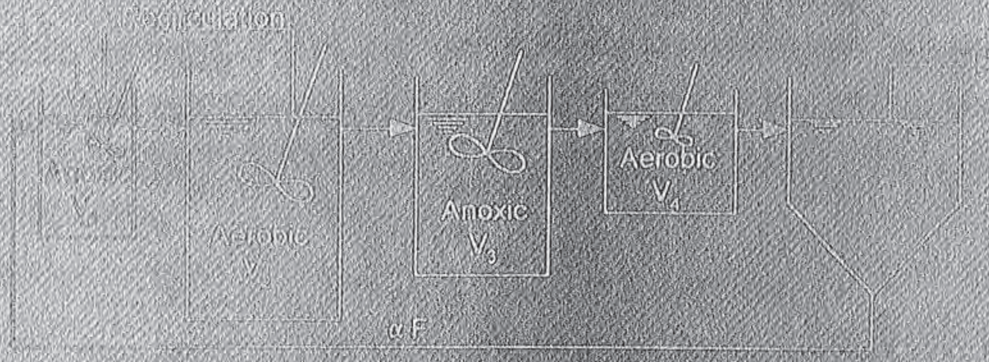
Table 8–26
Typical design parameters for commonly used biological phosphorus-removal processes[a]

Design parameter/process	SRT, d	MLSS, mg/L	τ, h: Anaerobic zone	τ, h: Anoxic zone	τ, h: Aerobic zone	RAS, % of influent	Internal recycle, % of influent
A/O	2–5	3000–4000	0.5–1.5	—	1–3	25–100	
A^2/O	5–25	3000–4000	0.5–1.5	0.5–1	4–8	25–100	100–400
UCT	10–25	3000–4000	1–2	2–4	4–12	80–100	200–400 (anoxic) 100–300 (aerobic)
VIP	5–10	2000–4000	1–2	1–2	4–6	80–100	100–200 (anoxic) 100–300 (aerobic)
Bardenpho (5-stage)	10–20	3000–4000	0.5–1.5	1–3 (1st stage) 2–4 (2nd stage)	4–12 (1st stage) 0.5–1 (2nd stage)	50–100	200–400
PhoStrip	5–20	1000–3000	8–12		4–10	50–100	10–20
SBR	20–40	3000–4000	1.5–3	1–3	2–4		

[a] Adapted from WEF (1998).

BIOLOGICAL WASTEWATER TREATMENT

Second Edition, Revised and Expanded



C. P. LESLIE GRADY, JR.
GLEN T. DAIGGER
HENRY C. LIM

Fermentation of primary sludge to generate an influent stream high in VFAs for use in systems that remove both nitrogen and phosphorus is a recent, and exciting, development.[11] It offers significant potential for enhancing the performance and improving the reliability of BNR systems.[52,53,64] The impact of fermentation on the performance of BNR facilities is described in Section 11.2.3, while the basic principles of sludge fermentation and the design of fermenters are discussed in Chapter 13.

11.1.4 Comparison of Process Options

Table 11.2 summarizes the primary benefits and drawbacks of several BNR systems. The MLE process offers good nitrogen removal, moderate bioreactor volume requirements, alkalinity recovery, good sludge settleability, reduced oxygen requirements compared to traditional activated sludge systems, and simple control. However, a high level of nitrogen removal cannot generally be achieved, as discussed previously. Practical MLR flow rates limit nitrate-N removal to between 60 and 85%. As illustrated in Figure 7.36, this constraint does not exist for the four-stage Bardenpho process, which includes a second anoxic zone. Performance data from full-scale wastewater treatment plants demonstrates this difference.[57] Processes with one anoxic zone typically produce effluents with total nitrogen concentrations ranging between 5 and 10 mg/L as N, while processes with two anoxic zones typically produce effluents with total nitrogen concentrations ranging between 1.5 and 4 mg/L as N.[57] However, this improved performance is at the expense of a larger bioreactor volume. Another benefit of the MLE and four-stage Bardenpho processes is alkalinity production by denitrification in the initial anoxic zone, which off-sets some of the alkalinity consumed by nitrification in the aerobic zone. Denitrification also reduces the oxygen requirement in the aerobic zone because nitrate-N serves as the electron acceptor during oxidation of some of the biodegradable organic matter, thereby removing the need for oxygen to do so. These effects are discussed in Sections 6.3, 6.4, 7.5, and 7.6, and illustrated in Figure 7.30. The reduced power requirements for oxygen transfer in the aerobic zone off-set some or all of the energy required to mix the anoxic zone and to pump the MLR. Good sludge settleability can be obtained with both the MLE and four-stage Bardenpho processes because the initial anoxic zone acts as a selector to control the growth of filamentous bacteria, as discussed previously. The incorporation of an anoxic zone in the bioreactor can also minimize denitrification problems in the secondary clarifier by reducing nitrate-N concentrations, making it impossible to generate sufficient nitrogen gas to cause sludge flotation.

Systems that encourage denitrification in an aerobic bioreactor provide the benefits of alkalinity recovery and oxygen requirement reduction associated with the MLE and four-stage Bardenpho processes. In fact, the total energy requirements in such systems are smaller since mixing and MLR facilities are generally not required. Some existing activated sludge facilities can easily be retrofitted. However, relatively large bioreactor volumes may be required since the microbial environment is not optimized, control can be more complex to restrict oxygen input to allow the anoxic regions to develop, and poor sludge settleability may result due to the growth of Group IV filamentous bacteria.

Appendix M: Intended Use Plan Application

- Exhibit 9B
- Exhibit 8
- Schedule A
- Schedule F
- Schedule G
- Exhibit 5

Exhibit 9B - Preliminary Review of Facility Plan Checklist

"Facility Plan" means a report certified by a professional engineer licensed to practice in Iowa and prepared in conformance with Chapter 11 of the Iowa Wastewater Facilities Design Standards (IWWFDS). A Facility Plan will not be required for non-funded minor sewer extensions, minor trunk and interceptor sewers, and minor pump stations where comprehensive planning is not completed, necessary or required. Facility planning submittals may be returned if they are deemed incomplete by the Department.

The transmittal letter referenced in Section 11.2.2 of the IWWFDS and a completed Exhibit 9B checklist by the engineer shall be bound with the engineering report. The transmittal letter must:

- Describe fully the scope of the project identified in Design Schedule A.
- Provide a statement on the feasibility of the project.
- Include a statement that this report has been accepted by the client.
- Indicate that the proposed project is in conformance with the long range planning of the area.
- Reference all information and approved planning reports necessary for a review.
- Clearly indicate the purpose of the submittal.

Exhibit 9B is divided into four sections as follows:

- Section 1 – All Projects
- Section 2 – New or Expanded Wastewater Treatment Facility Projects
- Section 3 – Earthen Basin Projects
- Section 4 – SRF Funded Projects

Section 1 must be completed for all projects. Sections 1 and 2 must be completed for projects involving new or expanded wastewater treatment facilities. Sections 1, 2, and 3 must be completed for projects that consist of new or expanded wastewater treatment lagoon facilities. Sections 1 and 3 must be completed for projects involving new or expanded equalization with earthen basins. In addition, complete Section 4 if the project is SRF funded.

Responses of **"Yes", "No", "?", or Not Applicable ("N/A")** may be used by DNR in completing Exhibit 9B Preliminary Review with explanations given, as appropriate. A "?" mark may be used by DNR staff where additional follow-up, or the consideration of additional information may be warranted before a comment is offered. Every attempt should be made to complete the Exhibit 9B preliminary review checklist using good engineering judgment and as accurately as possible for the benefit of decision makers. If the response is "No" by the engineer for location maps and/or geotechnical report, the transmittal letter must acknowledge that the Facility Plan is incomplete and provide adequate need and justification for the Department to initiate a concept review.

Section 1 – All Projects

1. Yes — A work initiation meeting determination has been made. If the meeting was determined to be necessary, the meeting has been held. The scope and milestones for the project have been clearly established.
2. No — A project location and a recommended alternative have been proposed by the A/E and the conclusion accepted by the Owner in accordance with Step 17, Section 11.2 of the Iowa Wastewater Facilities Design Standards and Design Schedule A.
3. Yes — A completed and signed Design Schedule A has been submitted in accordance with Section 11.1 of the Iowa Wastewater Facilities Design Standards.
4. Yes — Any proposed variation from the design standards contained in Chapter 567 IAC 64 is identified by the Engineer in accordance with Design Schedule A with justification provided in accordance with DNR rules.
5. Yes — A complete and achievable project implementation schedule has been provided identifying all project milestones in accordance with Section 11.2.5.3(k) of the Design Standards.
6. Yes — The Appendix (Technical Information and Design Criteria) is provided per Design Standard 11.2.11.
7. Yes — The facility plan is signed and certified by a professional engineer licensed in the State of Iowa.

Section 1 – Comment Box:

2. Council approval of Facility Plan expected 9/6/22, and submitted 9/7/22.

Section 2 – New or Expanded Wastewater Treatment Plant Projects

8. No — The Owner has filed an application for a new or amended NPDES permit as needed for the improvements described in the Facility Plan and has notified the review engineer of this submission.
9. Yes — Completed Design Schedules F and G have been submitted in accordance with Section 11.1 of the Iowa Wastewater Facilities Design Standards.
10. Yes — The location maps are prepared by the Engineer in accordance with Design Schedule F to the recommended scale and provide all requested detail to conduct a site survey investigation for the proposed new or expanded wastewater treatment facilities.
11. Yes — All hydraulic and organic design loadings in Design Schedule G and the Facility Plan are consistent with the preliminary design loadings concurred by the Department.
12. Yes — The project has conformed to the Waste Load Allocation (WLA) determination and the effluent limits which have been established by the DNR through Steps 9, 11, 12, 13, and 14 of the wastewater construction permitting procedures.
13. Yes — Where anti-degradation requirements apply, the recommended alternative is consistent with the anti-degradation alternatives analysis approved by the Department.
14. Yes — New Process Evaluation - all required engineering data and design basis formulated from the data for New Process Evaluation has been approved by the Department under Section 14.4.3 and was prepared by a licensed professional engineer other than the one employed by the manufacturer or patent holder.

Section 2 – Comment Box:

8. An NPDES permit application will be submitted as required for the new plant outfall once the final outfall location is established.

13. The antidegradation alternatives analysis is out for public comment. Final analysis is expected to be submitted 9/12/22.

Section 3 – Projects with Earthen Basins (Lagoon and Equalization Basins)

15. Yes — A completed geotechnical investigation engineering report is provided as a supplement to the engineer's report.

Section 3 – Comment Box:

15. Refer to Facility Plan Appendix K.

Section 4 – State Revolving Fund (SRF) Loan Projects

16. Yes — The proposed project is a fundable category (Refer to Subrule 567 IAC 90.2) for receipt of a CWSRF loan.
17. Yes — The Intended Use Plan application (Exhibit 8) is enclosed with the Facility Plan and the "Assurance with Respect to Real Property Acquisition" form.
18. ? — The Property/Easement Acquisition Schedule is included.
19. Accepted — The Owner has submitted all required Exhibit 5 information to the Environmental Review Services Coordinator in order to initiate the SRF environmental review.

Section 4 – Comment Box:

18. Plant site has been purchased. City is negotiating forcemain easement terms with the property owner. Easements or permits will be secured from the DOT for Highway 20 and from the Union Pacific Railroad for the railroad crossing.

This page for DNR Use Only

DNR Decisions:

---- 9B Complete

---- Concept Review Request

Conclusions by DNR:

CLEAN WATER STATE REVOLVING FUND
INTENDED USE PLAN (IUP) APPLICATION

Application Packet Checklist
Application Packet Instructions
IUP Application Form
Real Property Assurance Form

The application for inclusion on the Clean Water State Revolving Fund (CWSRF) IUP can be submitted only when the wastewater project is at the right stage of the construction permitting process. This packet outlines the requirements of the permitting process that must be met and includes the materials and information needed to complete the IUP application. Please use the checklist and instructions to make sure your application is complete before submitting it.

APPLICATION PACKET CHECKLIST

A. Construction Permitting Information -- To Be Completed by Applicant

Item	Applicant Entry	For DNR Use
Applicant Name	City of Webster City	
1. DNR Number (e.g. W2014-#### or S2014-####)	S2017-0216	Yes ☐ No ☐
2. DNR Project Manager Name	James Oppelt	Yes ☐ No ☐
3. Project Identification:	Wastewater Treatment Facility Improvements	Yes ☐ No ☐
4. Project Initiation Meeting Held (date)	12/13/2016	Yes ☐ No ☐
5. Flows and Loads Concurrence by DNR (date or N/A)	6/2/2022	Yes ☐ No ☐
If N/A, state reason:		
6. Wasteload Allocation Completed (date or N/A – see 5. above)	7/29/2022 & 8/11/2022	Yes ☐ No ☐
7. Antidegradation Alternatives Analysis Required (if no, go to 8.)	Yes ☒ No ☐	Yes ☐ No ☐
7a. Alternatives Analysis Approved by DNR (date or N/A)	In Review	Yes ☐ No ☐
8. Three Copies of Certified Facility Plan	Yes ☒	Yes ☐ No ☐
8a. If Already Submitted (submitted date) Certification Date:		Yes ☐ No ☐
9. Iowa Construction Permit Application Schedule A	Yes ☒	Yes ☐ No ☐
10. Schedules F and G (if needed for the project)	Yes ☒ N/A ☐	Yes ☐ No ☐
If N/A, state reason:		

For DNR Use: The Applicant has followed the DNR Wastewater Construction Permitting Process and the project is eligible to be placed on the IUP pending review of the SRF information requirements.
DNR Project Manager: ______________________ Date: ______________

B. State Revolving Fund Information -- To Be Completed by Applicant

Item	Applicant Entry	For SRF Use
11. IUP Application Signed	Yes ☒	Yes ☐ No ☐
12. DUNS Number Included (note: Form 4700-4 no longer required)	Yes ☒	Yes ☐ No ☐
13. Property Assurance Form Signed	Yes ☒	Yes ☐ No ☐
14. SRF Environmental Review Checklist and Attachments Completed and Submitted	Yes ☒	Yes ☐ No ☐

For SRF Use: The IUP application materials are complete.
The application will be placed on the IUP _______ *(IUP Year),* _____ *(IUP Quarter) with CWSRF Number CS1920* ______ .
DNR SRF: ______________________ Date: ______________

CLEAN WATER STATE REVOLVING FUND
INTENDED USE PLAN (IUP) APPLICATION INSTRUCTIONS

ITEMS 1 – 9: Wastewater Permitting

The Clean Water SRF Intended Use Plan Application will only be accepted when Items 1-9 have been completed through the Wastewater Construction Permitting Process of the DNR Wastewater Engineering Section. Please refer to the Wastewater Permitting Process Manual for detailed information on these steps.

1. DNR Number (e.g. W2014-#### or S2014-####): All wastewater construction projects are assigned unique numbers for tracking by DNR. A number beginning with W and the fiscal year indicates a Work Record. A number beginning with S and the fiscal year indicates a Project.

2. DNR Project Manager Name: A project manager from the DNR Wastewater Engineering Section is assigned to each project.

3. Project Identification: A brief description of the project is required in Design Schedule A, General Information. The project description must fall under the project scope established at the project initiation meeting. An accurate description is necessary because multiple construction contracts may have the same project numbers.

4. Project Initiation Meeting Held (date): A project initiation meeting must be held with the DNR, Owner, Consulting engineer (licensed professional engineer), and other parties.

5. Flows and Loads Concurrence by DNR (date): If flows and loadings will change due to the project, the DNR Project Manager must concur with the proposed design flows and loadings prior to preparing the Facility Plan.

6. Wasteload Allocation Completed (date): If a Wasteload Allocation is required for the project, it must be received by the Owner before preparing the Facility Plan.

7. Antidegradation Alternatives Analysis Required; 7a. Alternatives Analysis Approved by DNR (date): If an antidegradation alternatives analysis is required for the project, it must be approved by the DNR Project Manager before the Owner prepares the Facility Plan. If a Facility Plan is submitted prior to DNR approval of Antidegradation Alternatives Analysis, it will not be accepted for review.

8. Three Copies of Certified Facility Plan; 8a. If Already Submitted (date) and Certification Date: After completing all applicable planning steps as discussed above, the Facility Plan may be submitted to DNR. If three copies of the Facility Plan have already been submitted, please note the date submitted and certified and do not send additional copies.

9. Iowa Construction Permit Application Schedule A: Design Schedule A must be certified by both the Owner and the Consulting engineer (licensed professional engineer). It is required for all wastewater projects. Schedule A must indicate that Clean Water SRF financing will be requested to be considered as part of this IUP application.

10. Schedules F and G (if needed for the project): Schedule G provides Wastewater Treatment Plant project design information and Schedule F provides site information for treatment process site selection.

ITEMS 11 – 14: Clean Water SRF

11. IUP Application Signed: The Intended Use Plan application must be signed by the Owner's authorized representative.

12. DUNS Number Included: The Dun and Bradstreet Number (DUNS) was collected as part of EPA 4700-4 form. That form is no longer required for SRF applicants. If the Owner does not have a DUNS number, go to http://fedgov.dnb.com/webform to request one. While loan recipients no longer have to fill out the 4700-4 form, it is important to note that they are still required to comply with Title VI of the Civil Rights Act of 1964. Title VI provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

13. Property Assurance Form Signed: This form is required whether or not the Owner currently intends to purchase land using SRF funds. Land for siting treatment facilities is an eligible cost as of October 1, 2014.

14. SRF Environmental Review Checklist and Attachments Completed and Submitted: The ER checklist outlines the information needed to start the SRF ER Services.

Supporting materials may be requested to document funding requests and system needs.

Please include the following items with your application:

- Three official copies of the Facility Plan (unless previously submitted)
- Iowa Construction Permit Application Schedules A (and F and G where applicable).
- Materials included in Exhibit 5: SRF Environmental Review Checklist
- Real Property Assurance Form with authorized signature

Application materials should be sent to: srf-iup@dnr.iowa.gov

Quarterly Application Deadlines

For More Information about the Clean Water SRF IUP Application, contact Theresa Enright, 515-725-0498 or Theresa.enright@dnr.iowa.gov.

CLEAN WATER STATE REVOLVING FUND
INTENDED USE PLAN (IUP) APPLICATION FORM

This form may be used to apply for inclusion on the project priority list of the Clean Water SRF IUP at the time a complete Facility Plan is submitted. IUPs are developed on an annual basis with quarterly updates as needed. **This form is not an application for a loan**. SRF loan application materials may be obtained at www.IowaSRF.com. The loan application should not be completed until after bids are received.

Instructions:
Complete the requested information in the following sections to the best of your ability. Please print or type the information on the form. If a particular item does not apply to your system, enter n/a for "not applicable." Attach supporting documentation as needed. Keep a copy of the completed application for your records, submit a copy to your engineer, and submit the signed form to the following e-mail address: srf-iup@dnr.iowa.gov

For more information about the Clean Water SRF IUP Application, contact Theresa Enright at 515-725-0498 or Theresa.Enright@dnr.iowa.gov

Section 1: Applicant and Consulting Engineer Information

Applicant Name: City of Webster City

Applicant Address: 400 Second Street, PO Box 217

City: Webster City State: IA Zip: 50595

Authorized Representative: Daniel Ortiz-Hernandez

Telephone Number: 515-832-9151 E-mail: dortiz@webstercity.com

Signature: [signature] Title: City Manager

*DUNS Number: 07-350-0324

Consulting Engineer: Bolton & Menk, Inc.

Firm: (specify branch where consulting engineer is located) Ames, IA

Firm Address: 1519 Baltimore Drive

City: Ames State: IA Zip: 50010

Telephone Number: 515-233-6100 E-mail: Andrew.Sindt@bolton-menk.com

NPDES Facility No.: 4063001

Section 2: Project Schedule

Anticipated final plans and specifications submittal date: June 2023

Anticipated construction start date: October 2023

Section 3: Brief Project Summary (Attach additional pages if necessary.)

Describe the reasons for the proposed project: (i.e. specific water quality problem or system improvement)

Current RBC and Trickling Filter plant has reached the end of it's usefull life. Construction of a new activated sludge process is proposed for meeting total nitrogen and total phosphorus discharge goals inlcuded in the Iowa Nutrient Reduction Strategy. East lift station below grade pump dry well is failing and standby power is not currently provided.

Describe the proposed project: (i.e., specific solution to the water quality problem, or proposed system improvement)

Renovate lift station at existing treatment plant site. Construct forcemain to proposed treatment plant site south of town. Construct flow equalization lagoon, preliminary treatment building, activated sludge process, clarifiers, sludge thickening, aerobic digesters, sludge dewatering and dewatered sludge stroage, operations building with lab and garage, outfall to Boone River. Replace dry pit pumps at east lift station with submersile pumps. Replace valves, electrical and controls, and install standby generator.

Which other funding programs are you considering to assist in completion of this project? (Check all that apply)

- ☐ Community Development Block Grant (CDBG)
- ☒ Rural Development Grant and/or Loan
- ☒ Reserve Funds
- ☐ Other: ____________________

Compliance Status

- ☐ Has been referred to the Iowa Attorney General
- ☐ Has received administrative order from DNR
- ☐ Under compliance schedule in the NPDES permit
- ☐ Other: ____________________

Section 4: Project Environmental Outcomes

Primary Impacted Waterbody

NHD Reach Code: 07100005000027

Designated Surface Water Uses (e.g. A1, BWW): A1, B(WW-1), HH

Project Will Contribute to Water Quality... (check one)

- ☒ Improvement
- ☐ Maintenance
- ☐ Not Applicable

Project Will Allow the System to... (check one)

- ☒ Achieve Compliance
- ☐ Maintain Compliance
- ☐ Not Applicable

Project Will Allow the System to Address... (check all that apply)

- ☒ Existing TMDL
- ☐ Projected TMDL
- ☐ Watershed Management Plan

Section 5: Project Cost

Cost Category	Estimated Total Cost in $
Legal Expenses	125,000
Land and Easements	+ 200,000
Engineering Planning Fees	+ 180,000
Engineering Design Fees	+ 3,800,000
Engineering Construction Fees	+ 5,000,000
Construction	+ 56,830,000
Equipment	+
Other:	+
Other:	+
PROJECT SUBTOTAL	= 66,135,000
Contingencies	+ 12,482,000
Planning and design loan proceeds, if rolling into construction loan	+
Less Any Funds Requested from Other Sources	- 2,000,000
LOAN SUBTOTAL	= 76,617,000
Loan Initiation Fee (Loan Subtotal x .005)	+ 384,000
TOTAL IUP REQUEST (Round to the nearest $1,000)	= 77,001,000

Section 6: Consultants

Bond Counsel Firm: Dorsey & Whitney, LLP

Contact Person: John Danos

Mailing Address: 801 Grand Avenue, Ste 4100

City: Des Moines State: IA Zip: 50306

Telephone Number: 515-283-1000 E-mail: Danos.John@dorsey.com

Municipal Advisor Firm: Public Financial Management

Contact Person: Susanne Gerlach

Mailing Address: 801 Grand Avenue

City: Des Moines State: IA Zip: 50309

Telephone Number: 515-724-5734 E-mail: GERLACHS@pfm.com

*Please provide these contacts if known at the time of application. The requirement to engage a Municipal (Financial) Advisor is new to SRF for projects starting in fiscal year 2015.

Section 7: Acquisition of Property by SRF Applicants

US ENVIRONMENTAL PROTECTION AGENCY
ASSURANCE WITH RESPECT TO REAL PROPERTY ACQUISITION
OF TITLE III OF THE UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY
ACQUISITION POLICIES ACT OF 1970 AS AMENDED

The City of Webster City (Applicant) hereby assures that it has authority under applicable State and local law to comply with Section 213 of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, 84 Stat. 1894 (42 U.S.C. 4601) as amended by the Surface Transportation and Uniform Relocation Assistance Act of 1987, Title IV of Public Law 100-17, 101 Stat. 246-256 (42 U.S.C. 4601 note) and 49 CFR 1.48(cc); and certifies, assures and agrees that, notwithstanding any other provision set forth in the application.

1. For projects resulting in the displacement of any person:
   a. It will adequately inform the public of the relocation payments and services which will be available as set forth in Subparts A, C, D and E of 49 CFR 24.
   b. It will provide fair and reasonable relocation payments to displaced persons as required by Subparts D and E of 49 CFR 24.
   c. It will provide a relocation assistance program for displaced persons offering services described in Subpart C of 49 CFR 24.
   d. Comparable replacement dwellings will be available pursuant to Subpart F of 49 CFR 24, or provided if necessary, a reasonable period in advance of the time any person is displaced.
   e. In acquiring real property, it will provide at least 90 days written notice to each lawful occupant of real property acquired, stating the date such occupant is required to move from a dwelling or to move his business or farm operation.

2. For projects resulting in the acquisition of real property:
   a. It will fully comply with the requirements of Subpart B of 49 CFR 24.
   b. It will adequately inform the public of the acquisition policies, requirements and payments which apply to the project.
   c. It will make every effort to acquire real property expeditiously through negotiation.
   d. Before the initiation of negotiations it will have the real property appraised and give the owner or his representative an opportunity to accompany the appraiser during inspection of the property, except as provided in 49 CFR 24.102(c)(2).
   e. Before the initiation of negotiations it will establish an amount which it believes to be just compensation for the real property, and make a prompt offer to acquire the property for that amount; and at the same time it will provide the owner a written statement of the basis for such amount in accordance with 49 CFR 24.102.
   f. Before requiring any owner to surrender possession of real property it will pay the agreed purchase price; or deposit with the court, for the benefit of the owner, an amount not less than the approved appraisal of the fair market value of the property; or pay the amount of the award of compensation in a condemnation proceeding for the property.
   g. If interest in real property is to be acquired by exercise of the power of eminent domain, it will institute formal condemnation proceedings and not intentionally make it necessary for an owner to institute legal proceedings to prove the fact of the taking of this real property; and
   h. It will offer to acquire the entire property, if acquisition of only part of a property would leave its owner with an uneconomic remnant.

References to 49 CFR are citations to Title 49, Code of Federal Regulations, Part 24, published in the Federal Register Vol. 54, No. 40, March 2, 1989.

This document is hereby made part of and incorporated in any contract or agreement, or any supplements and amendments thereto, relating to the above-identified application and shall be deemed to supersede any provision therein to the extent that such provisions conflict with the assurances or agreements provided therein.

Daniel Ortiz-Hernandez
(Legal Name of Applicant)

By [signature]
(Signature of Authorized Representative)

08/26/2022
(Date)

Exhibit 11A
Iowa Department of Natural Resources
Wastewater Section
Construction Permit Application
SCHEDULE A, Construction Permit Application

APPLICANT	**ENGINEER**
Owner: City of Webster City	Firm: Bolton & Menk
Address: 400 Second Street, PO Box 217	Address: 1519 Baltimore Drive, Ames, IA
Representative: Daniel Ortiz-Hernandez	Project Officer: Andrew Sindt, P.E.
Phone Number: 515-832-9151	Phone Number: 515-233-6100
Email: dortiz@webstercity.com	Email: Andrew.Sindt@bolton-menk.com

Project Identification: Wastewater Treatment Faciltiy Improvements
Estimated Start Date*: October 2023 Estimated Completion Date: October 2025

PLEASE RESPOND TO ALL QUESTIONS	**Yes**	**No**
1. Has an engineering report, facilities plan or other information previously been submitted for this project? **If Yes:** Project Identity: ______ Date Submitted: ______	☐	☒
2. Does the project and construction permit application, as submitted, follow the recommendations, design loadings, construction schedule, permit limits, and conclusions of the approved engineering report or facilities plan? **If No:** Provide the design basis and technical information justifying all changes.	☐	☐
3. Are there three complete sets of plans and specifications accompanying this application? For a minor gravity sewer extension within the meaning of 455B.183.3 Code of Iowa and Design Standard 11.1, two complete sets will be adequate for expeditious approval. For more complex projects, three sets of plans and specifications may be requested.	☐	☒
4. Are approved standard specifications a part of this application? **If Yes:** Approved Standard Specifications of (municipality or firm): ______ Date Approved: ______	☐	☒
5. Does each set of plans and specifications or engineering report accompanying this application contain a "professional engineering seal" executed in conformance with 542B.16, Code of Iowa? **If No:** Processing will be delayed pending receipt of applicable design schedules and certified plans, specifications or engineering report.	☒	☐
6. Is this a joint wastewater and water supply project? **If Yes:** A construction permit application for the water supply project should be submitted separately to the Water Supply Section. A Water Supply permit fee may be required.	☐	☒
7. Is the applicant to provide treatment of effluent resulting from this construction? **If No:** A Sewage Treatment Agreement executed by the authority providing treatment must accompany this form.	☒	☐
8. Is a new or amended operation permit necessary to use the facilities described in this application? **If Yes:** A new or amended permit to operate may be requested prior to the receipt of a construction permit.	☒	☐
9. Is any waterline located within 10 feet; or any private or public well, lake, or public recreation area located within 400 feet of the proposed construction? **If Yes:** Identify and locate the facility(ies) relative to the proposed construction.	☐	☒
10. Will construction inspection be conducted by a licensed engineer employed by the applicant? **If No:** Name of Engineering Firm Conducting Inspection: Bolton & Menk, Inc.	☐	☒
11. Will this project utilize CWSRF loan funds?	☒	☐

CERTIFICATION

APPLICANT	**ENGINEER**
I certify that I am the authorized representative of the owner and state that the project identified above is approved by the owner.	I certify that all aspects of the design included in this application conform to applicable standards contained in Chapter 567 IAC 64, or that an explanation and justification for any proposed variations from such standards is attached. I am familiar with the information contained in this application and, to the best of my knowledge, such information is complete and accurate.
Signature [signature] Date 8/29/22	Signature [signature] Date 8/29/22

*Estimated Construction Start Date: Complete applications must be submitted at least 120 days in advance of the date for starting construction in accordance with Rules 567 IAC 60.4 and 64.2

Please complete the Schedule Checklist on the following page of this form.

DOCUMENT CHECKLIST

Identify all categories included in this project. Also, identify schedules attached to this application.

Schedule	Title	Attached	Included in Project	Submittal Date
B	Collection System	☐	☐	
C	Lateral Sewer Extension	☐	☐	
D	Trunk & Interceptor Sewer	☐	☐	
E	Wastewater Pump Station	☐	☐	
F	Treatment Project Site Selection	☐	☒	7/13/2022
G	Treatment Project Design Data	☐	☒	5/23/2022
H1	Schematic Flow Diagram	☐	☐	
H2	Treatment Process Loading and Removal Efficiency	☐	☐	
H3	Mechanical Plant Reliability	☐	☐	
I	Screening, Grit Removal and Flow Measurement	☐	☐	
J	Septic Tank System	☐	☐	
K1	Controlled Discharge Pond	☐	☐	
K2	Aerated Pond	☐	☐	
K3	Anaerobic Lagoon	☐	☐	
L	Setting Tanks	☐	☐	
M	Fixed Film Reactor-Stationary Media	☐	☐	
N	Rotating Biological Contactor	☐	☐	
O	Aeration Tanks or Basins	☐	☐	
P	Gas Chlorination	☐	☐	
Q	Sludge Digestion and Holding	☐	☐	
R1	Sludge Dewatering and Disposal	☐	☐	
R2 (A&B)	Low Rate Land Application of Sludge	☐	☐	
R3	Land Application of Sewage Sludge (To be developed)	☐	☐	
S	Land Application of Wastewater (To be developed)	☐	☐	
	Sewage Treatment Agreement	☐	☐	

Identify any categories included in this project which are not provided in the above list of schedules.

BOLTON & MENK
Real People. Real Solutions.

1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

Via Email James.Oppelt@dnr.iowa.gov

July 13, 2022

Mr. James Oppelt
Iowa Department of Natural Resources
Wallace State Office Building
502 East 9th Street
Des Moines, IA 50319-0034

RE: Webster City Wastewater Treatment Facility Improvements
Project No.: A21.119239
NPDES Discharge Permit No. 4063001
Treatment Project Site Selection – Schedule F Submittal

Dear Mr. Oppelt:

This is a submittal of the Webster City WWTF Schedule F Treatment Project Site Selection for DNR review and approval. The City is in the Wastewater Treatment Facility Planning phase for the construction of a new wastewater treatment facility.

Please contact me with any questions and discussion regarding this information.

Sincerely,

Bolton & Menk, Inc.

Andrew D. Sindt, P.E.
Environmental Engineer

c: Daniel Ortiz-Hernandez - City Manager, City of Webster City, w/ enclosures
Biridiana Bishop - Public Works Director, City of Webster City, w/ enclosures
Nick Knowles - Wastewater Superintendent, City of Webster City, w/ enclosures
Trent Lambert, DNR Mason City Field Office, w/ ensclosures
Andrew Sindt, Bolton & Menk, Inc., w/ enclosures
Greg Sindt, Bolton & Menk, Inc., w/ enclosures
File, w/ enclosures

enclosures

DNR USE ONLY
Project No. ____________
Permit No. ____________

Iowa Department of Natural Resources
Wastewater Section
Construction Permit Application
SCHEDULE F, Treatment Project Site Selection, Exhibit 11B

Date Prepared	Project Identity
7-13-2022	City of Webster City Wastewater Treatment Facility Improvements
Date Revised	

1. Project Location: County Hamilton County Section 007 Township 088 Range 025
   Is this a: ☒ New Site ☐ Existing Site ☐ Expansion of Existing Site
2. Provide the following as attachments:
   a) General plat layout of area within a five mile radius of proposed treatment works, noting all important features (USGS map may be used).
   b) Site layout of area within a 1,500 foot radius of the proposed treatment works with a scale of 1 inch equal to 200 feet, noting proposed treatment works, existing treatment works and all features listed in Subrule 567 IAC 64.2(3): inhabitable residences, commercial buildings, inhabitable structures, public shallow wells, public deep wells, private wells, lakes and public impoundments, property lines and rights-of-way, etc. The radius distance from lagoons shall be measured from the water surface.
3. Does the project lie in a floodplain? ☐ Yes ☒ No
   Elevation of 100 year flood (MSL): 1010 Elevation of 25 year flood (MSL): ____________
   Will the treatment works structures, including the electrical and mechanical equipment, be protected from physical damage by the 100-year flood? ☐ Yes ☒ No
   Will the plant remain operational during the 25 year flood? ☒ Yes ☐ No
   Method of flood protection: Elevation of structures above flood plain
4. Minimum distance to high water table: 8 feet
5. Describe geology of area: Wisconsinian glacial till and alluvium soils underlain by Mississipian bedrock system consisting primarily of undifferentiated formations of dolomite, limestone, and standstone.
6. Describe soil conditions: Wadena Loam, Cylinder Loam, Biscay Loam
7. State the minimum distances and directions from proposed treatment works to:
   a) Public shallow wells NA
   b) Public deep wells 2,740 ft S
   c) Private wells 1,275 ft NW
   d) Inhabitable residences, commercial buildings, or other inhabitable structures 1,330 ft SE
   e) Lakes and public impoundments 1,560 ft SE
   f) Property lines and rights-of-way 0 ft E, S, W
   g) Other ____________
8. Where any of the separation distance criteria of Subrule 567 IAC 64.2(3) will not be met, state the basis for requesting site approval (e.g. a written agreement with the owner of the inhabitable building has been obtained, the proposed separation distance is at least 90% of the existing separation distance and a problem has not existed or will be created, etc.)
9. Direction of the prevailing winds: NW, SE
10. Sulfate content of the raw water supply source: ________ mg/L. Identify source: ____________
11. Is this area available for expansion? ☒ Yes ☐ No If yes, how much? 4 acres
    Location of area: Onsite Identify owner of property: City of Webster City
12. Will site be accessible via an all-weather access road? ☒ Yes ☐ No Type: City Street
13. Source of STP water supply:
    Maintenance/Cleanup City Potable? ☒ Yes ☐ No
    Laboratory/Sanitary City Potable? ☒ Yes ☐ No
    ____________ Potable? ☐ Yes ☐ No
14. Receiving Stream: Boone River tributary to: Des Moines River
    7-day 10-year Low Flow: 5.46 cfs. Source of stream flow data: ____________
    Drainage area above site: 844 square miles
    Is stream: ☐ intermittent ☒ continuous flow (perennial)
    Describe use designation of receiving stream: Boone River - A1, B(WW-1), HH

Instructions for Schedule F

1. Identify the project and location.

2. Important features which include public shallow wells, public deep wells, private wells, inhabitable residences, commercial buildings, or other inhabitable structures, lakes, public impoundments, and other public use or recreation areas, property lines, and rights-of-way, and any other feature affected by the water quality shall be included on the 1500 foot radius site layout.

   Site layout shall indicate final proposed layout (location) of all proposed treatment works.

3. Completely describe any adverse impact on the treatment facility caused by high water.

4. Indicate minimum distance to typical wet weather groundwater level.

5. Self-explanatory.

6. Self-explanatory.

7. See subrule 567 IAC 64.2(3) of the Iowa Administrative Code for the required separation distances. When the separation distances in the referenced subrule cannot be maintained for the expansion, upgrading or replacement of existing facilities, the separation distances shall be maintained at no less than 90 percent of the existing separation distance on the site, providing no data is available indicating that a problem has existed or will be created. If requesting the 90 percent exception, the proposed separation distance from each potentially affected item or structure shall be identified on Schedule F or an attachment to the form.

   The 90 percent exception criteria does not apply to new treatment plants at a new site.

8. Self-explanatory.

9. Self-explanatory.

10. Self-explanatory.

11. Self-explanatory.

12. Self-explanatory.

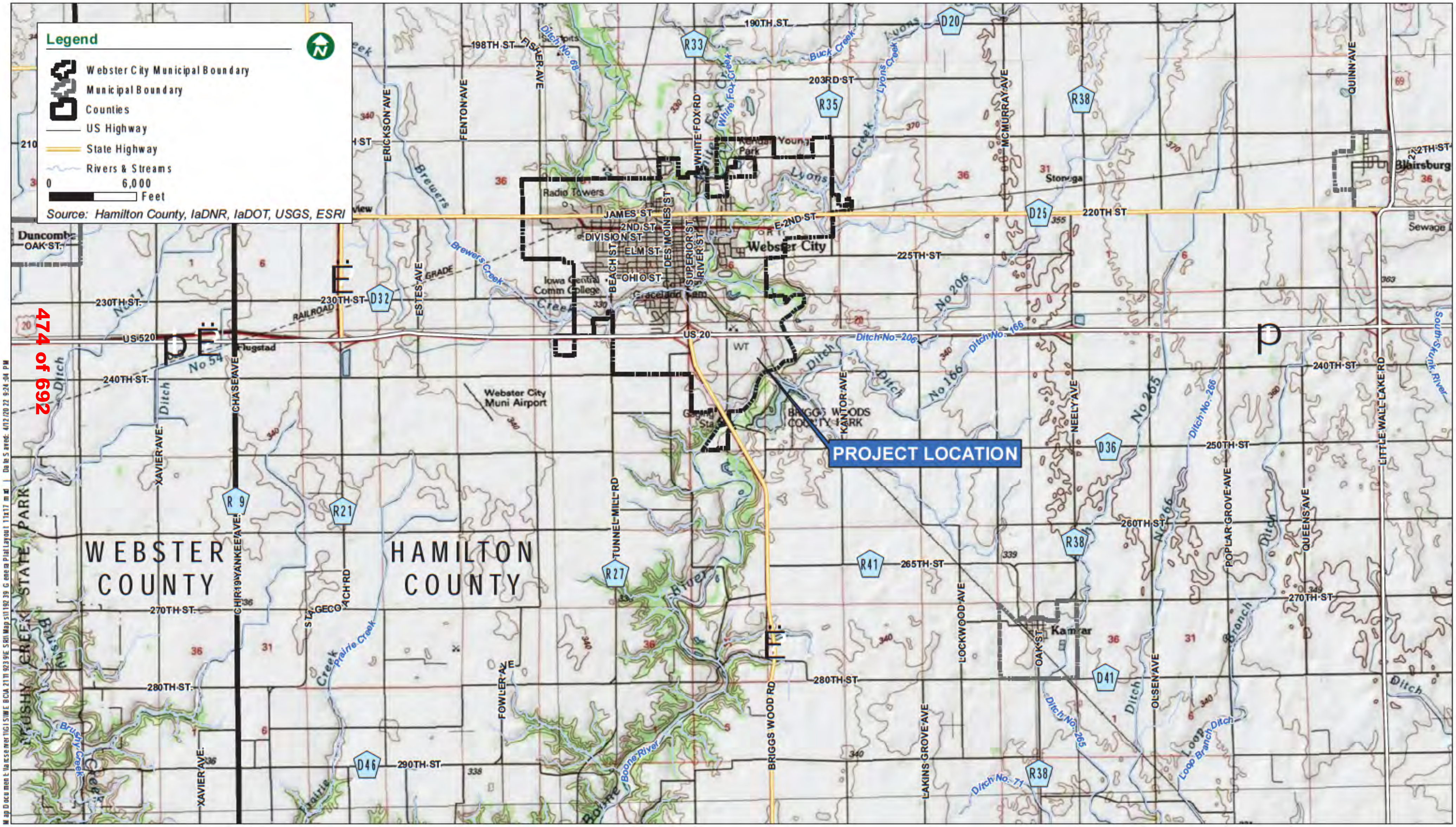
13. Self-explanatory.

14. Self-explanatory.

NOTE: Complete a separate Schedule F for each separate project site.

Figure F.1 - General Plat Layout

July 2022



Webster City, Iowa

Figure F.3 - Public Wells

July 2022

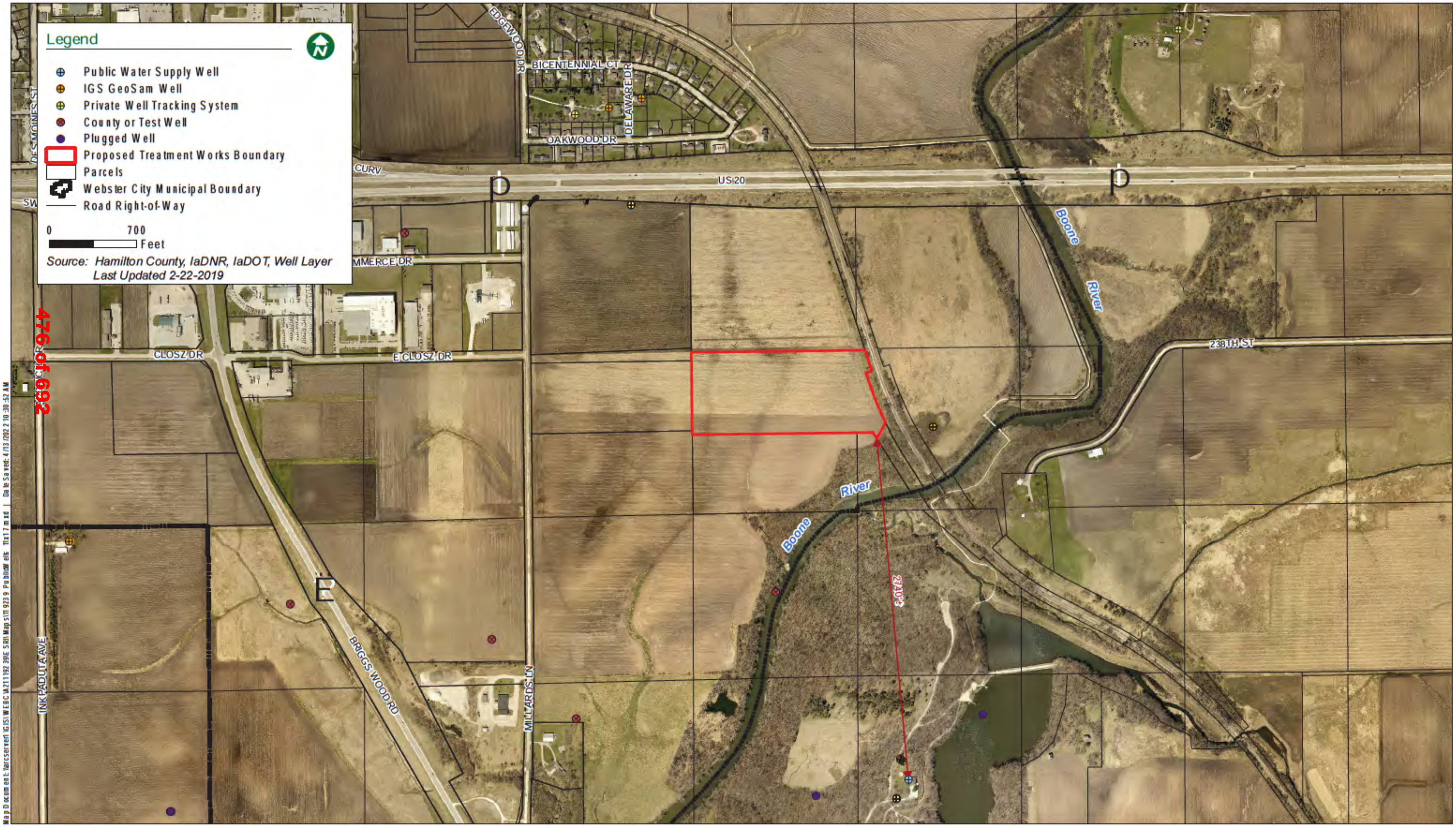
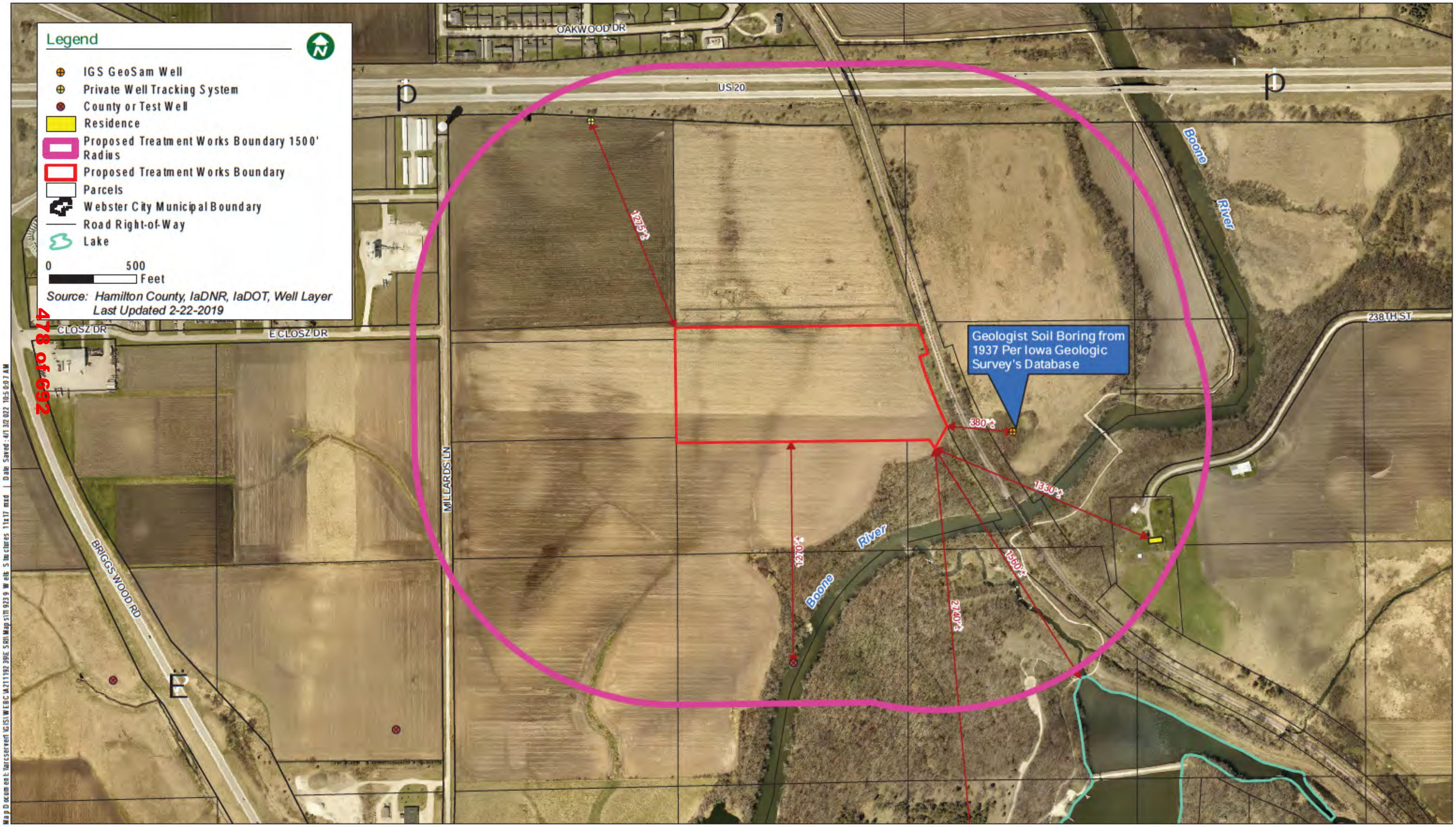


Figure F.2 - Wells & Structures

July 2022



BOLTON & MENK
Real People. Real Solutions.

1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
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Bolton-Menk.com

Via Email James.Oppelt@dnr.iowa.gov

May 24, 2022

Mr. James Oppelt
Iowa Department of Natural Resources
Wallace State Office Building
502 East 9th Street
Des Moines, IA 50319-0034

RE: Webster City Wastewater Treatment Facility
Project No.: A21.119239
NPDES Discharge Permit No. 4063001
Design Flows and Loads Submittal
Waste Load Allocation Request
Revised Design Flows and Loads
Your May 18 Email

Dear Mr. Oppelt:

The following are answers to the questions in your May 18 email (copy enclosed) regarding the revised City of Webster City design flows submitted for your review on April 15, 2022:

1. Equalization Basin Design Calculations. The equalization basin design volume is based on operating the mechanical plant at a maximum daily flow equal to the AWW flow PLUS 0.50 MGD. Historical data is used in determining the storage volume required for the flow in excess of the maximum daily flow (AWW plus 0.50 MGD) to the mechanical plant. The maximum month (or maximum AWW) flow during the 2012-2019 period of data evaluation was 3.349 MGD. Therefore, 3.439 plus 0.500 MGD (3.939 MGD) was used as the maximum day flow to the mechanical plant in the model of 2012-2019 data for sizing the flow equalization basin. This approach provides the minimum basin volume required for storage of excess I/I flows while limiting the mechanical plant flow to the AWW flow plus 0.500 MGD. We used the 0.500 MGD flow in excess of AWW to reduce the required equalization basin volume. It was a trade off between much larger equalization basin volume for the extra 0.500 MGD storage versus slightly larger mechanical plant to handle the extra 0.500 MGD.

2. Mechanical Plant Design Flow Calculations with Storm Water Flow Equalization Basin. The AWW design flow to the new mechanical treatment plant is based on the projected design year AWW flows in Table 2.4 (4.586 MGD) PLUS 0.500 MGD. The maximum day design flow rate to the mechanical plant is 5.086 MGD as per Table 2.5.

3. Schedule G Flows. The April 11, 2022 revised Schedule G includes the RATED MWW design flow AFTER storm water flow equalization (5.086 MGD). As requested per your May 18 email, the Schedule G MWW design flow is revised to the design flow rate PRIOR TO flow equalization

(9.430 MGD). See enclosed 5/23/2022 revised Schedule G. Thank you for the clarification on the Schedule G requirements regarding MWW flow data for facilities with flow equalization. The notation in line 2 of Schedule G "(with MWW wet weather flow equalization)" has been deleted. The 5.086 MGD mechanical plant maximum day design flow is included in the Facility Plan Table 2.5.

4. AWW Design Flow. The plant will be designed for the 4.586 MGD AWW flow as per Table 2.5.

5. RO Water Treatment Waste Load. There would be no BOD, TSS, TKN, or P loading from future reverse osmosis water treatment process reject water.

6. BOD Design Loads. All design loads are expressed as BOD as per DNR requirements. The Facility Plan Design Flows and Load Submittal at Page 2-2 (first paragraph) includes a statement that "DNR staff can assume for the purposes of process review and design organic loading rate that the BOD load is equivalent to the CBOD load for this facility". We used the historical CBOD raw wastewater monitoring data in the evaluation of design loads because DNR required CBOD monitoring in raw wastewater in the previous NPDES discharge permit. There is no historical raw wastewater BOD monitoring data.

Please contact me with any questions and discussion regarding this information.

Sincerely,

Bolton & Menk, Inc.

Gregory L. Sindt, P.E.
Senior Environmental Engineer

c: Daniel Ortiz-Hernandez - City Manager, City of Webster City, w/ enclosures, via email
Biridiana Bishop - Public Works Director, City of Webster City, w/ enclosures, via email
Nick Knowles - Wastewater Superintendent, City of Webster City, w/ enclosures, via email
Ryan Olive - DNR NPDES Discharge Permits Section, via email
Katie Greenstein - DNR Waste Load Allocation Section, via email
DNR Mason City Field Office, via email
Andrew Sindt, Bolton & Menk, Inc., w/ enclosures
Greg Sindt, Bolton & Menk, Inc., w/ enclosures
File, w/ enclosures

Enclosures: Schedule G, May 23, 2022 Revised
James Oppelt May 18, 2022 Email

Iowa Department of Natural Resources
Wastewater Section
Construction Permit Application
SCHEDULE G, Treatment Project Design Data
Exhibit 11C

DNR USE ONLY
Project No. ____________
Permit No. ____________

Date Prepared	Project Identity
5/23/2020	City of Webster City Wastewater Treatment Facility Improvements
Date Revised	
5/23/2022	

1. Project Description	New Wastewater Treatment Facility			
2. Design Flows	Present Year (2020)		Design Year (2040)	
Design Condition →	AWW (MGD)	MWW (MGD)	AWW (MGD)	MWW (MGD)
Domestic/Commercial Flow	0.93	1.56	1.068	1.068
Industrial				
Flow	0.63	0.74	0.704	0.883
Rated Flow			0.704	0.883
Other Flow (specify)	Future RO Reject	0	0.217	0.400
Infiltration/Inflow	0.80	1.80	2.597	7.079
Total				
Flow	3.30	6.00	4.586	9.430
Rated Flow	3.30	6.00	4.586	9.430

Average Dry Weather Flow (ADW):	Peak Hourly Wet Weather Flow (PHWW):	Demographic Data:
1.50 MGD (present year)	6.70 MGD (present year)	Population 7,900 (present year)
1.989 MGD (design year)	11.780 MGD (design year)	Population 11,609 (design year)

3. Organic Design Loadings		Present Year (2020)		Design Year (2040)	
Design Condition →		Max. 30 day (#/day)	Max. Day (#/day)	Max. 30 day (#/day)	Max. Day (#/day)
Domestic/Commercial	BOD_5	1,722	1,722	4,063	5,456
	TSS			5,340	8,358
	TKN	259	259	488	639
Industrial	BOD_5	2,428	2,428	3,383	5,209
	TSS			2,764	4,487
	TKN	141	141	357	516
Other (Specify)	BOD_5				
	TSS				
	TKN				
Total	BOD_5	4,150	4,150	7,446	10,665
	TSS			8,104	12,845
	TKN	400	400	845	1,155

4. Effluent Limitations		BOD_5		TSS		NH_3-N (most stringent month)		Other		Other	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
Operation Permit	mg/l										
Effluent Limits*	#/day										

*Date of Waste Load Allocation (WLA) determination: 4/11/22 Revised WLA Request

**Effluent Limitations entered shall be the more stringent value between the existing NPDES Permit and the WLA or an approved antidegradation analysis

5. Major Industrial/Commercial contributors or Significant Industrial User: (Max. Day Loadings)

Waste Contributors	Pre-Treat (Y/N)	Operation		Design Loadings						
				Flow						
		Hrs/ Day	Days/ Week	Ave. MGD	Max. MGD	BOD5 #/day	Susp. Solids #/day	TKN #/day	Oil & Grease #/day	#/day
Mary Ann's Foods	Y	24	6	0.100	0.140	400	300	80		
Webster City Meats	Y	24	6	0.070	0.110	1,000	250	80		

6. SCHEDULE G SUPPLEMENTAL CHECKLIST MUST ACCOMPANY THIS FORM

Gregory Sindt

From: Oppelt, James <james.oppelt@dnr.iowa.gov>
Sent: Wednesday, May 18, 2022 1:53 PM
To: Andrew Sindt; Gregory Sindt
Subject: Revised Flows and Loads for Webster City

Andrew and Greg:

I'm confused about what the proposed mechanical plant capacity is (I'm not sure we discussed in the first version). Reading one portion of the document I'm thinking that the mechanical plant capacity (after EQ) is 5.086 MGD because you say that increasing this decreases required EQ capacity. But then it goes on to describe using 3.939 MGD in the model used to size EQ.

On Sch. G the design MWW is 9.43 MGD but the "rated" flow is 5.086 MGD, which makes me think your concept of rated flow is different from that we give in the instructions in Sch. G. That is, our "rated" flow in Sch. G is a flow where we consider industrial wastewater production shifts as opposed to just the average industrial flows. Rated flows on Sch. G should always be equal to or higher than the "Flow". Yours is lower, which makes me think you are stating the rated flow for the mechanical facility which is a different concept entirely that is not explicitly listed in Sch. G. Nowadays we try to remember to note the difference between the mechanical plant rated flow and the total flow (or "rated" flow on Sch. G) in facility plan approvals and construction permits but Sch. G is only for total raw influent values prior to EQ.

Is the AWW for the plant going to be 4.586 MGD? If so, it sounds like the plan is to provide less mechanical plant capacity than the AWW flow? We don't like to see plants sized for less than AWW even if there is EQ.

Does the proposed RO waste have any loadings to be concerned with?

To be clear, the BOD5 loads on schedule G will be what we use to verify plant capacity. Not CBOD loads.

I can probably approve the flows and loads that are on your schedule G. Some of what I am asking for here can be worked out in the FP stage, but just want to be clear before I approve these.

Thanks.

JAMES C. OPPELT • Environmental Engineer, Senior
Water Quality Bureau
Iowa Department of Natural Resources
515-725-8428
502 E 9th St, Des Moines, IA 50319
www.iowadnr.gov

June 2, 2022

Daniel Ortiz-Hernandez
400 Second Street
P.O. Box 217
Webster City, IA 50595

Re: Wastewater Treatment Facility Improvements
DNR Project No. S2017-0216

Subject: Revised Flows and Loads Approval

Dear Mr. Ortiz-Hernandez:

The Iowa Department of Natural Resources has reviewed the Revised Design Flows and Loads Submittal dated May 24, 2022 for the above-referenced project. The Flows and Loads are approved.

Design Waste Loadings

Design Flows			Max 30-day Design Loadings		
ADW	1.989	MGD	BOD5	7,446	lbs./day
AWW	4.586	MGD	TSS	8,104	lbs./day
MWW	9.430*	MGD	TKN	845	lbs./day
PHWW	11.780*	MGD			

*The hydraulic capacity of the mechanical plant is 5.086 MGD after wet weather flow equalization.

Department approval does not eliminate the need for the facility to comply with all federal, state and local regulations. This department must be notified of any change in your proposal and approve the change prior to incorporation in plans and specifications.

If you have any questions or comments concerning this project, please feel free to contact me at 515/725-8428 or email james.oppelt@dnr.iowa.gov.

Sincerely,

James C. Oppelt, P.E.
Project Manager
Wastewater Engineering Section

cc: Bolton & Menk, Inc. / Greg Sindt, P.E.
DNR Field Office 2
DNR Sewage File 6-40-63-0-01

SRF Environmental Review Checklist

The following checklist outlines the information needed to start the SRF Environmental Review (ER) Services. Please provide the following to: srf-iup@dnr.iowa.gov

*Environmental Review Services will not be initiated until after all items marked **REQUIRED** are received.

Applicant Name: City of Webster City

✓ Other federal funding sources that will be used for the proposed project. (Check ALL that apply)

☐ No other federal funding sources are planned.

☒ CDBG

- What amount was requested? $ TBD
- Has the funding amount been awarded? ☐ Yes ☒ No
- Who is preparing the environmental review documents for this funding source? Please provide contact information. TBD

☒ USDA-RD

- What amount was requested? $ TBD
- Has the funding amount been awarded? ☐ Yes ☐ No
- Who is preparing the environmental review documents for this funding source? Please provide contact information. TBD

☐ Other: Please specify program ______

- What amount was requested? $ ______
- Has the funding amount been awarded? ☐ Yes ☐ No
- Who is preparing the environmental review documents for this funding source? Please provide contact information. ______

✓ The anticipated construction start date for the proposed project. (Check ALL that apply)

☒ The anticipated construction start date on the current IUP application is correct.

☐ The anticipated construction start date has changed from the date listed in the IUP application.

- What is the new anticipated construction start date for the project? ______

☐ The proposed project schedule is dependent on other funding source(s).

- Will the construction start date be delayed if other funding is not awarded? ☐ Yes ☒ No

☐ The proposed project schedule is dependent on an existing compliance schedule.

- What is the construction start date listed in the compliance schedule? ______

✓ A description of the current project scope including: what is proposed to be constructed, specific construction methods that will be used, estimated dimensions (length, width, depth) of excavated areas and the proposed construction schedule if construction will be phased **(REQUIRED)**.

Renovate east lift station. Renovate main lift station at existing treatment plant site. Construct forcemain to proposed treatment plant site by trenchless and open cut method. Construct flow equalization basin, preliminary treatment building, activated sludge process, clarifiers, sludge thickening, aerobic digesters, sludge dewatering and dewatered sludge stroage, operations building with lab and garage, outfall to Boone River.

✓ Indicate if any of the following ancillary impacts will result from the proposed project. (Check ALL that apply)
☒ Abandonment or demolition (partial or entire) of existing building/structures
☒ Borrow pits
☒ Staging areas for equipment and materials
☒ Temporary and/or permanent easement areas
☐ Pavement replacement (street, driveway, sidewalk)
☒ New access for roads/utility lines

✓ A recent aerial map with the marked boundaries of the project area. The map should also include labeled location(s) of all proposed construction boundaries (include any ancillary impacts listed above as applicable). If a specific area has yet to be defined, please mark a larger area that will include the final project area.
☒ An aerial map of the project area map is included **(REQUIRED):**
- What is the approximate size of the total project area? 40.5 acres
- How much of the total project area will be impacted by ground-disturbing (excavation, grading, tree removal, etc.) construction activity? 40.5 acres

☒ A site sketch of the project area map is included with the following **(REQUIRED):**
- All locations of ground disturbance and staging areas marked
- North arrow
- A minimum of one labeled street

☐ Shape files have been provided

✓ Photos with a descriptive caption (include location & direction) of the project area showing current land use and habitat.
☒ Photos with captions are included (digital files are preferred).

✓ Indicate which of the following impacts are anticipated as a result of the proposed project. (Check ALL that apply)
☒ Demolition, abandonment or rehabilitation of any building/structure over 50 years old. Picture(s) showing the interior and exterior façade of the building/structure should be provided. Provide the following information for each building/structure over 50 years old that will be impacted.
- What year was the building/structure originally constructed? If the exact year is unknown, provide an estimate **(REQUIRED)**. ____________
- What material(s) is the building/structure made of? ____________
- Have any additions or substantial alterations to the building/structure occurred? If so, describe what was done and when. ____________

☐ Brick sewers or street surfaces will be disturbed by construction activity.
- Has a historic context (including Iowa Site Inventory Forms) been prepared for the brick sewers/street surfaces? ☐ Yes ☐ No
- Describe any planned steps to minimize adverse effect to the brick sewers/streets.

☐ Existing prairie will be disturbed by construction activity.
- How much prairie will be disturbed? ____________ acres
- Has a floral study been conducted of the prairie area? ☐ Yes ☐ No
- Describe any planned steps to minimize adverse effect to the prairie.

☒ Trees (greater than 4" diameter breast height) will be removed.

- Will tree removal occur between October 1 and March 31 to avoid impacting federally threatened or endangered bat species during the summer maternity period? ☒ Yes ☐ No

☐ Wetlands will be disturbed by construction activity.

- How much of the wetland area will be permanently impacted? ________ acres
- Has a Joint Application been submitted to determine permit requirements? ☐ Yes ☐ No

**In the interest of keeping your project on schedule, SRF recommends submitting the Joint Application prior to or immediately following the submission of this document.

☒ Planned stream/creek crossings.

- What is the name of the stream/creek crossing? N/A - outlet from Oxbow Lake to Boone River
- What construction method(s) are planned for the crossing? Trenchless (directional drill)
- Will excavation activity take place to the bed, bank of the stream/creek? ☐ Yes ☐ No
- Has a Joint Application been submitted to determine permit requirements? ☐ Yes ☐ No

☒ Planned work within a mapped 100-year flood plain.

- What construction activity is planned within the flood plain? Installation of underground pipe
- If ground disturbance will occur, will pre-construction contours be restored after construction activity is completed? ☒ Yes ☐ No
- Has a Joint Application been submitted to determine permit requirements? ☐ Yes ☐ No

☒ Planned work within state or federal owned and/or managed land.

- What construction activity is planned within state/federal land? Installation of underground pipe crossing Hwy 20
- Has a Joint Application been submitted to determine permit requirements? ☐ Yes ☐ No

☒ Farmland will be permanently converted to non-agricultural uses.

- What is the total size of the farm unit(s) that contains the project area? 22 acres
- How much of the project area has been farmed (managed for a scheduled harvest or timber activity) more than 5 of the last 10 years? 22 acres
- How much of the project area will be permanently converted from agricultural use as a result of the proposed project? 22 acres

✓ Landowner permission is required for archaeological survey on private property, if needed. *Please note that archaeological survey will not begin until this permission is obtained.

☐ Yes, landowner permission has been obtained (documentation is provided).

- Does the landowner(s) have any specific requests or requirements for archeological work to be conducted (for example, before/after harvest)? ________ acres

☐ No, landowner permission has not been obtained at this time.

- When is landowner permission anticipated to be obtained? ________

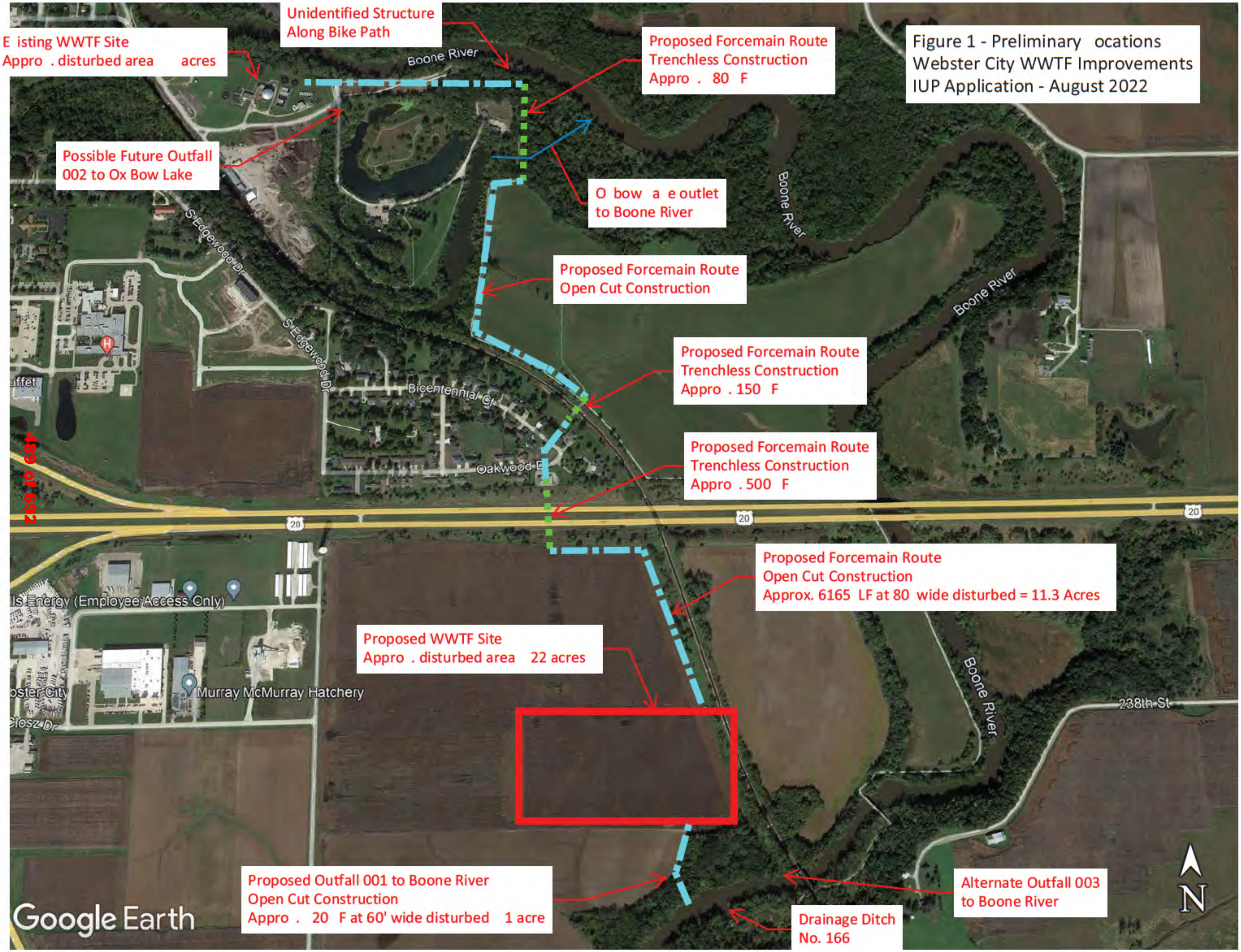
Figure 1 - Preliminary ocations
Webster City WWTF Improvements
IUP Application - August 2022
E isting WWTF Site
Appro . disturbed area acres
Unidentified Structure
Along Bike Path
Proposed Forcemain Route
Trenchless Construction
Appro . 80 F
Possible Future Outfall
002 to Ox Bow Lake
O bow a e outlet
to Boone River
Proposed Forcemain Route
Open Cut Construction
Proposed Forcemain Route
Trenchless Construction
Appro . 150 F
Proposed Forcemain Route
Trenchless Construction
Appro . 500 F
Proposed Forcemain Route
Open Cut Construction
Approx. 6165 LF at 80 wide disturbed = 11.3 Acres
Proposed WWTF Site
Appro . disturbed area 22 acres
Proposed Outfall 001 to Boone River
Open Cut Construction
Appro . 20 F at 60' wide disturbed 1 acre
Drainage Ditch
No. 166
Alternate Outfall 003
to Boone River
Boone River
S Edgewood Dr
Bicentennial Ct
Oakwood D
20
Murray McMurray Hatchery
238th St
N
Google Earth

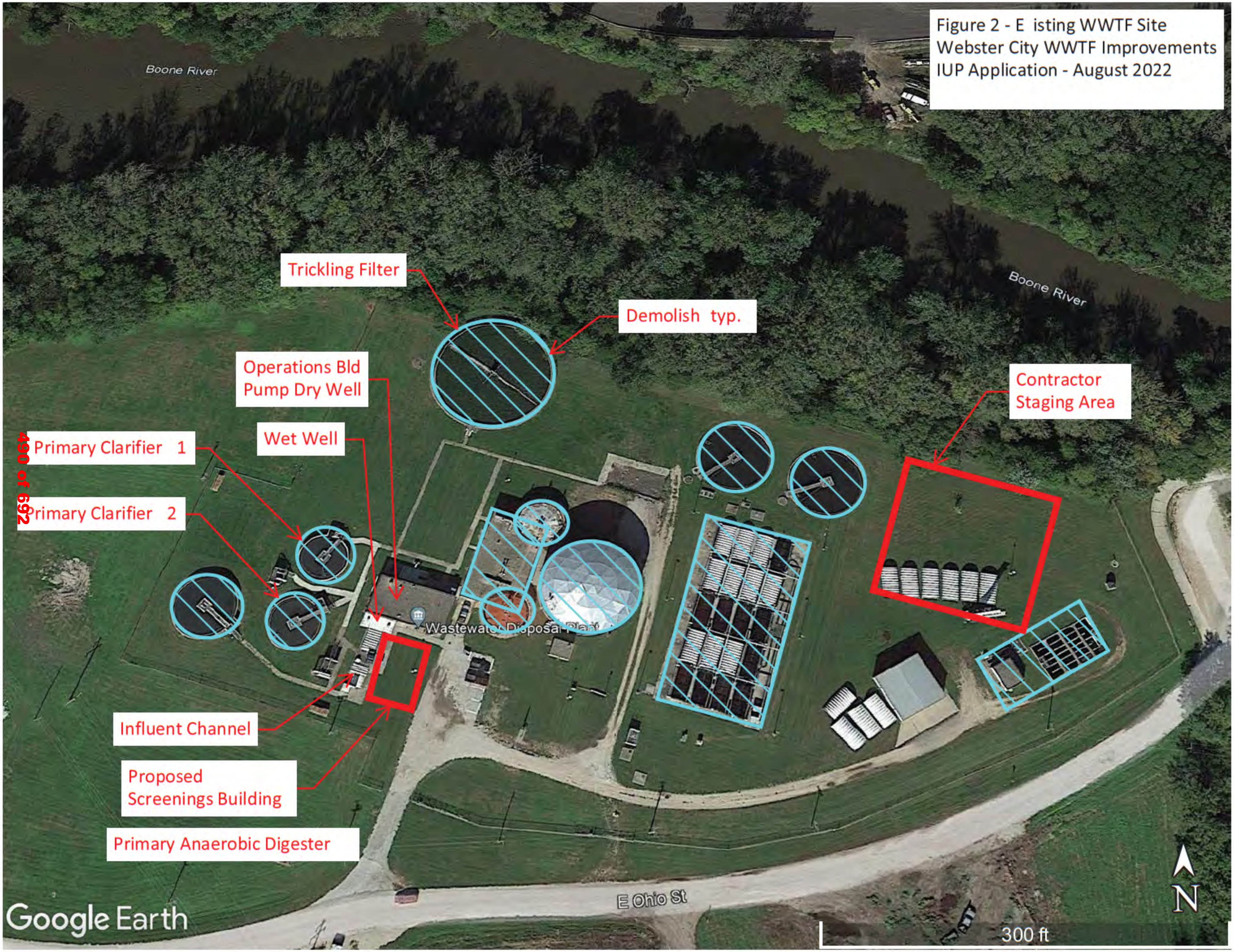
Figure 2 - E isting WWTF Site
Webster City WWTF Improvements
IUP Application - August 2022
Boone River
Boone River
Trickling Filter
Demolish typ.
Operations Bld
Pump Dry Well
Wet Well
Primary Clarifier 1
Primary Clarifier 2
Contractor
Staging Area
Influent Channel
Proposed
Screenings Building
Primary Anaerobic Digester
Wastewater Disposal Plant
E Ohio St
N
300 ft
Google Earth

Figure 3 - Proposed WWTF Site Plan

August 2022

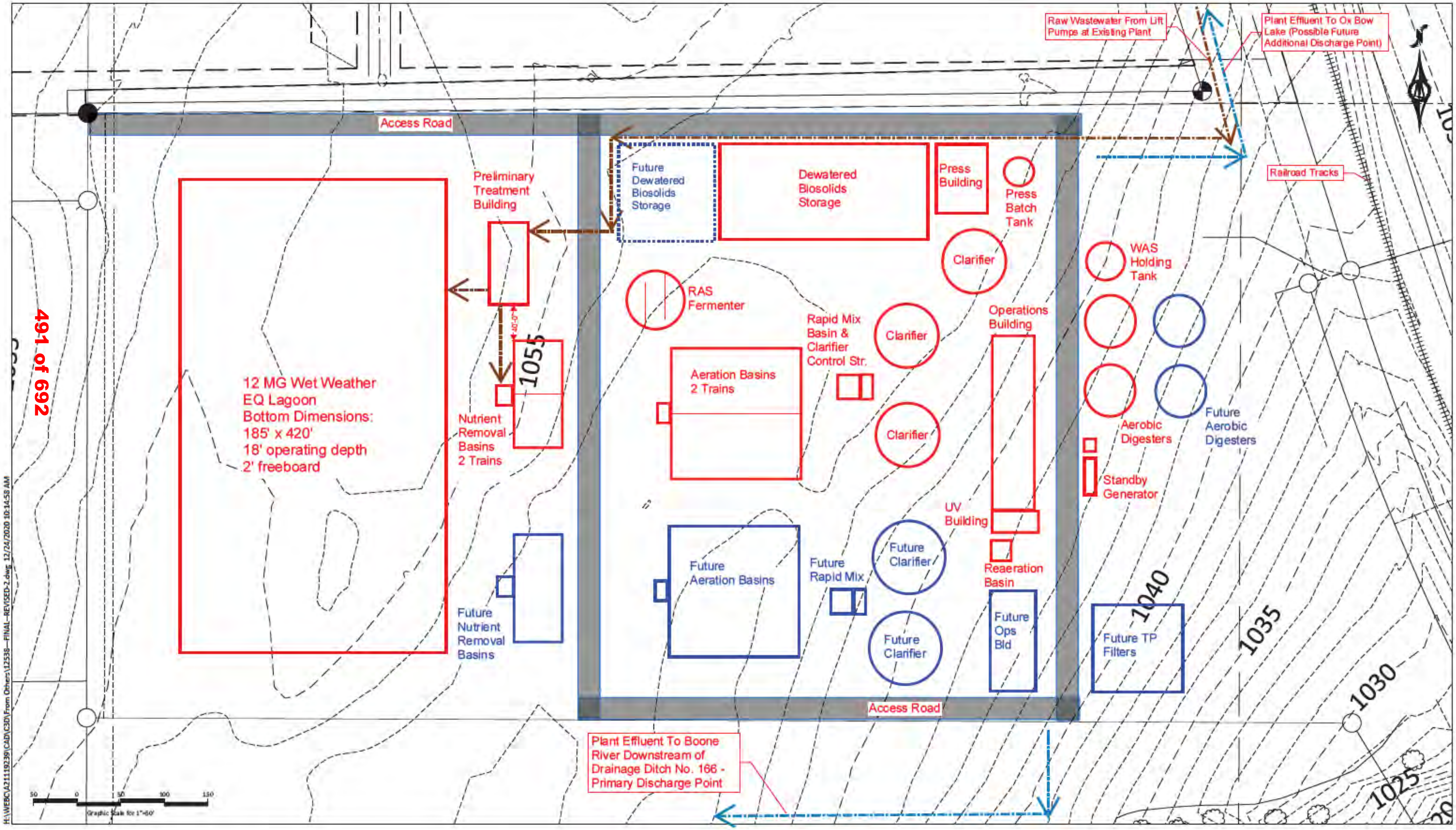

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Figure - East ift Station
Webster City WWTF Improvements
IUP Application - August 2022

Figure 4 - East Lift Station Photos
Webster City WWTF Improvements
IUP Application - August 2022

Webster City WWTF Improvements

IUP Application – August 2022

SRF Environmental Review Checklist

Demolition Summary:

Item No.	Name	Date Constructed	Date of Substantial Alteration	Materials
1.	Primary Clarifier #1 Tank (north tank)	1939	2017 – rebuilt walls	Reinforced concrete
2.	Primary Clarifier #2 Tank (south tank)	1962		Reinforced concrete
3.	Trickling Filter	1962		Reinforced concrete
4.	Primary Anaerobic Digester Tank	1939		Reinforced concrete with brick facade

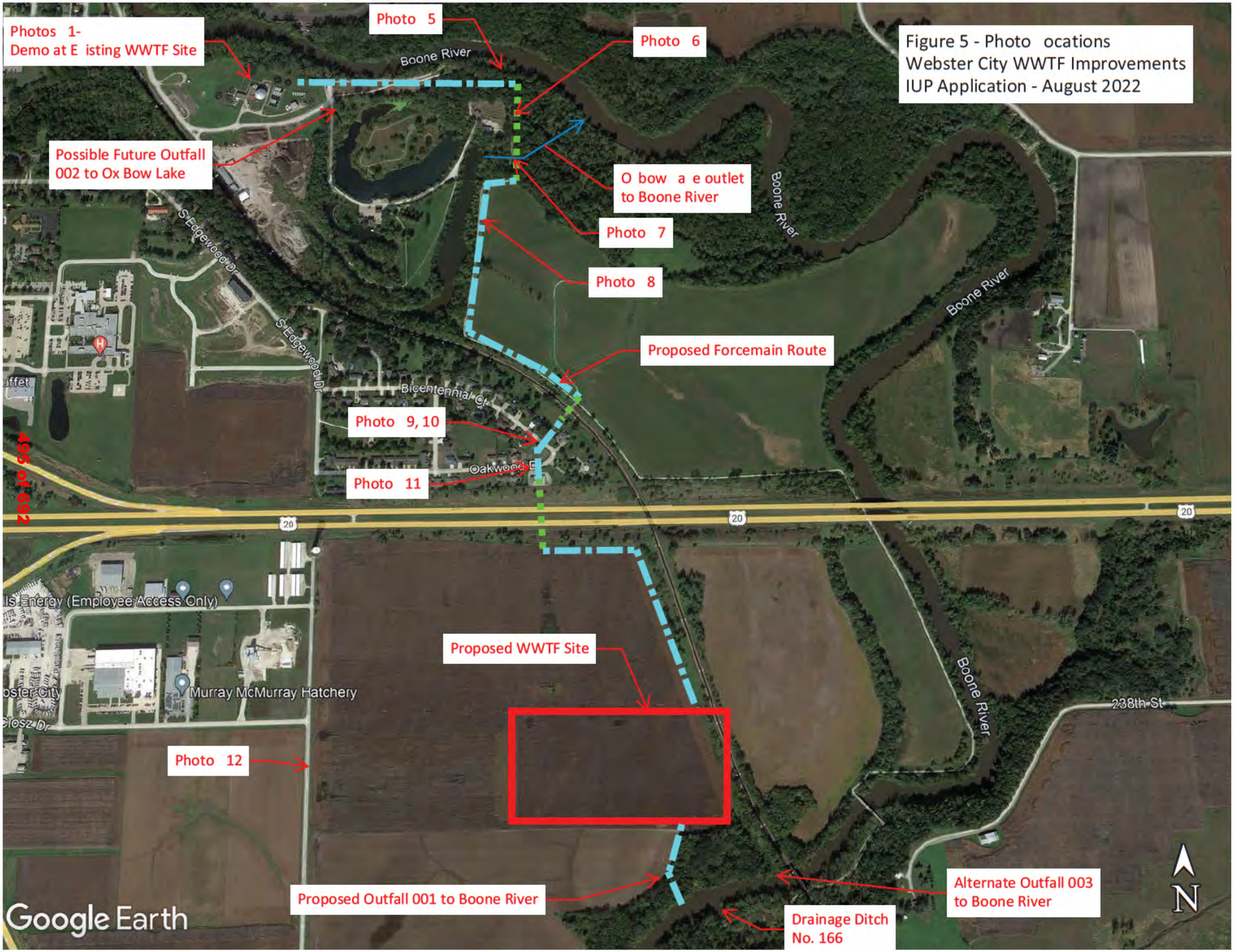
Figure 5 - Photo   ocations
Webster City WWTF Improvements
IUP Application - August 2022
Photos   1-
Demo at E isting WWTF Site
Photo   5
Photo   6
O bow   a e outlet
to Boone River
Photo   7
Photo   8
Possible Future Outfall
002 to Ox Bow Lake
Proposed Forcemain Route
Photo   9, 10
Photo   11
Proposed WWTF Site
Photo   12
Proposed Outfall 001 to Boone River
Drainage Ditch
No. 166
Alternate Outfall 003
to Boone River
Boone River
S Edgewood Dr
Bicentennial Ct
Murray McMurray Hatchery
238th St
20
N
Google Earth

Photo taken looking north.

Photo #1 - Existing WWTF Site Demo
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking southwest.

Photo #2 - Existing WWTF Site Demo
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking north.

Photo #3 - Existing WWTF Site Demo
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking northeast.

Photo #4 - Existing WWTF Site Demo
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking north. Structure is located along existing bike path that forcemain route is planned to follow. Plan for structure to be protected during construction.

Photo #5 - Existing Conditions
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking south.

Photo #6 - Existing Conditions
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking northeast.

Photo #7 - Existing Conditions
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking south.

Photo #8 - Existing Conditions
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking northeast.

Photo #9 - Existing Conditions
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking south.

Photo #10 - Existing Conditions
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking south. Utility is planning to decommission and demo existing substation.

Photo #11 - Existing Conditions
Webster City WWTF Improvements
IUP Application - August 2022

Photo taken looking east.

Photo #12 - Existing Conditions
Webster City WWTF Improvements
IUP Application - August 2022

Appendix N: Antidegradation Alternatives Analysis

Antidegradation Alternatives Analysis

City of Webster City

August 2022

DRAFT

Prepared by:
Bolton & Menk, Inc.
1519 Baltimore Drive
Ames, Iowa 50010
P: 515-233-6100
F: 515-233-4430

BOLTON & MENK
Real People. Real Solutions.

Certification

Antidegradation Alternatives Analysis

City of Webster City, Iowa
A21.119239

August 2022

	I hereby certify that this engineering document 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 Iowa. DRAFT (Signature) (Date) Printed or typed name: Andrew D. Sindt, P.E. My license renewal date is December 31, 2022 Pages or sheets covered by this seal: All

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Table of Contents

Figures

Tables

Appendix

I. E E UTIVE S MMARY

A. General

The City of Webster City is in the Facility Planning stage of a wastewater treatment facility improvements project. The e isting treatment facility has reached the end of it s useful life and requires repairs, equipment replacement and modifications for increased design year 2040 flows and loads. Additionally, the existing treatment process of primary clarification, trickling filters and RBC’s is not conducive to meeting total nitrogen (TN) and total phosphorus (TP) discharge goals set forth in the Iowa Nutrient Reduction Strategy and included in the City’s NPDES discharge permit. Webster City submitted a Nutrient Reduction Feasibility Report in February 2018 to fulfil the requirement for POTWs to evaluate and implement economically and practicably feasible nutrient removal technologies. After further evaluation and consideration for future needs, the City of Webster City has decided to build a new wastewater treatment facility south of town with provisions included to achieve TN and TP removal. This Antidegradation Alternatives Analysis is required by the Iowa water quality standards as part of the Facility Plan process.

The Antidegradation Alternatives Analysis is a summary of wastewater treatment and disposal alternatives that are considered during the Facility Planning process. The alternatives are broad categories of alternative process design concepts. The emphasis of this evaluation is the review of impacts of alternative treatment and disposal processes on degradation of receiving stream quality as a result of the increase in discharge over the current facility basis of design (IDNR Schedule G design capacity). The evaluation includes economic and technical feasibility components.

A Base Pollution Control Alternative (BPCA) is selected based on application of conventional technology. Other, less degrading alternatives are compared with the BPCA in an economic evaluation. A less degrading alternative is considered economically feasible if the net present cost of the alternative is less than 115% of the BPCA.

Three alternatives were considered in addition to the BPCA:

1. Recycle /Reuse
2. Land Application
3. Regional Treatment

The preferred alternative (BPCA) is an extended aeration activated sludge treatment facility with biological nitrogen and phosphorus removal with optional future chemical phosphorus removal. Proposed point of discharge is a new outfall to Boone River. The potentially less degrading alternatives are not selected due to failure to pass the economic feasibility criteria and reasonableness criteria.

Compared to the existing facility, the proposed BPCA alternative will decrease the current and future degradation to the Boone River. The proposed e tended aeration activated sludge treatment facility will be designed to meet 20-year projected design flows and loadings, including nitrogen and phosphorus removal as required by the Iowa Nutrient Reduction Strategy.

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II. E ISTING CONDITIONS AND DESIGN PARAME E S

A. Existing Conditions

The wastewater treatment plant has been constructed under several major projects from 1939 through 1999. Most of the process equipment and mechanical equipment was replaced during the 1995 and 1999 plant improvement projects.

The plant is a biological treatment facility with primary clarification for raw solids removal and anaerobic digestion with the following major components:

- aerated grit removal
- raw lift pumps (4)
- primary clarifiers (3)
- trickling filter
- intermediate lift pumps (3)
- rotating biological contactors (RBCs) (20)
- final clarifiers (2)
- chlorine disinfection
- sodium metabisulfite dechlorination
- anaerobic biosolids digesters (2)
- biosolids storage tank
- liquid biosolids land application

The plant was constructed and improved in several stages. The following is a summary of the existing facility construction dates:

- 1939 Original Plant Construction
  - operations building
  - Primary Clarifier No. 1 (north) tank
  - primary anaerobic biosolids digester tank
  - intermediate lift wet well
- 1962 Trickling Filter Expansion
  - trickling filter tank and media
  - Primary Clarifier No. 2 (south) tank
- 1977 Tertiary Treatment, Disinfection, and Sludge Treatment Expansion
  - aerated grit removal tanks
  - raw wet well
  - Primary Clarifier No. 3 (west) tank
  - RBC biological treatment tanks
  - final clarifier tanks

- chlorine contact basin and building
- outfall pipe to river
- secondary anaerobic biosolids digester
- electrical control panels

- 1995 Phase I Plant Improvements
  - intermediate lift pumps
  - trickling filter recirculation piping
  - RBC covers (demolish RBC building)
  - RBC equipment (12 of 20 units)
- 1999 Phase II Plant Improvements
  - raw lift pumps
  - maintenance garage
  - biosolids storage tank
  - RBC equipment (8 of 20 units)
  - RBC and final clarifier diversion structure (peak flow split)
  - primary sludge pumps and piping
  - primary clarifier equipment
  - trickling filter distributor
  - final clarifier equipment
  - primary anaerobic digester cover
  - secondary anaerobic digester cover
  - HVAC equipment – all buildings
  - biosolids treatment equipment and pumps
  - biosolids treatment piping
  - biosolids treatment control system
  - biosolids treatment boilers
  - biogas piping and waste gas burner
  - process area lighting fixtures and wiring
  - chemical feed equipment
  - roofing system – all buildings
  - masonry tuck pointing (partial) all buildings
- 2016-17 Renovation Project
  - replace primary digester cover
  - replace primary digester mixing system
  - renovate Primary Clarifier No. 1 tank

Table 2.1 is a summary of the construction dates and ages of the significant assets.

The rated plant capacity as summarized in Table 2.2. The discharge limits are summarized in Table 2.3.

Table 2.1 – Wastewater Treatment Facility – Summary of Significant Asset Ages

Component	Construction Date	Age Years
Operations Building	1939	83
Primary Clarifier No. 1 Tank	1939	83
Primary Digester Tank	1939	83
Intermediate Wet Well	1939	83
Trickling Filter Tank and Media	1962	60
Primary Clarifier No. 2 Tank	1962	60
Raw Wet Well and Grit Removal	1977	45
Primary Clarifier No. 3 Tank	1977	45
RBC Tanks	1977	45
Final Clarifier Tanks	1977	45
Chlorine Contact Tank	1977	45
Secondary Digester Tank	1977	45
Electrical Equipment	1977	45
Intermediate Lift Pumps and Piping	1995	27
RBC Covers	1995	27
RBC Equipment (12 of 20 Units)	1995	27
Raw Lift Pumps and Piping	1999	23
Biosolids Storage Tank	1999	23
RBC Equipment (8 of 20 Units)	1999	23
Primary Clarifier Equipment	1999	23
Primary Sludge Pumps and Piping	1999	23
Trickling Filter Distributor	1999	23
Final Clarifier Equipment	1999	23
Digester Covers and Equipment	1999	23
Chemical Feed Equipment	1999	23
Roofing Systems	1999	23
HVAC Equipment	1999	23
Process Area Electrical and Lighting	1999	23
Primary Digester Cover Replacement	2017	5
Primary Digester Mixing System	2017	5
Primary Clarifier No. 1 Tank Renovation	2017	5

A schematic diagram of the existing wastewater treatment process is presented in Figure 2.1.

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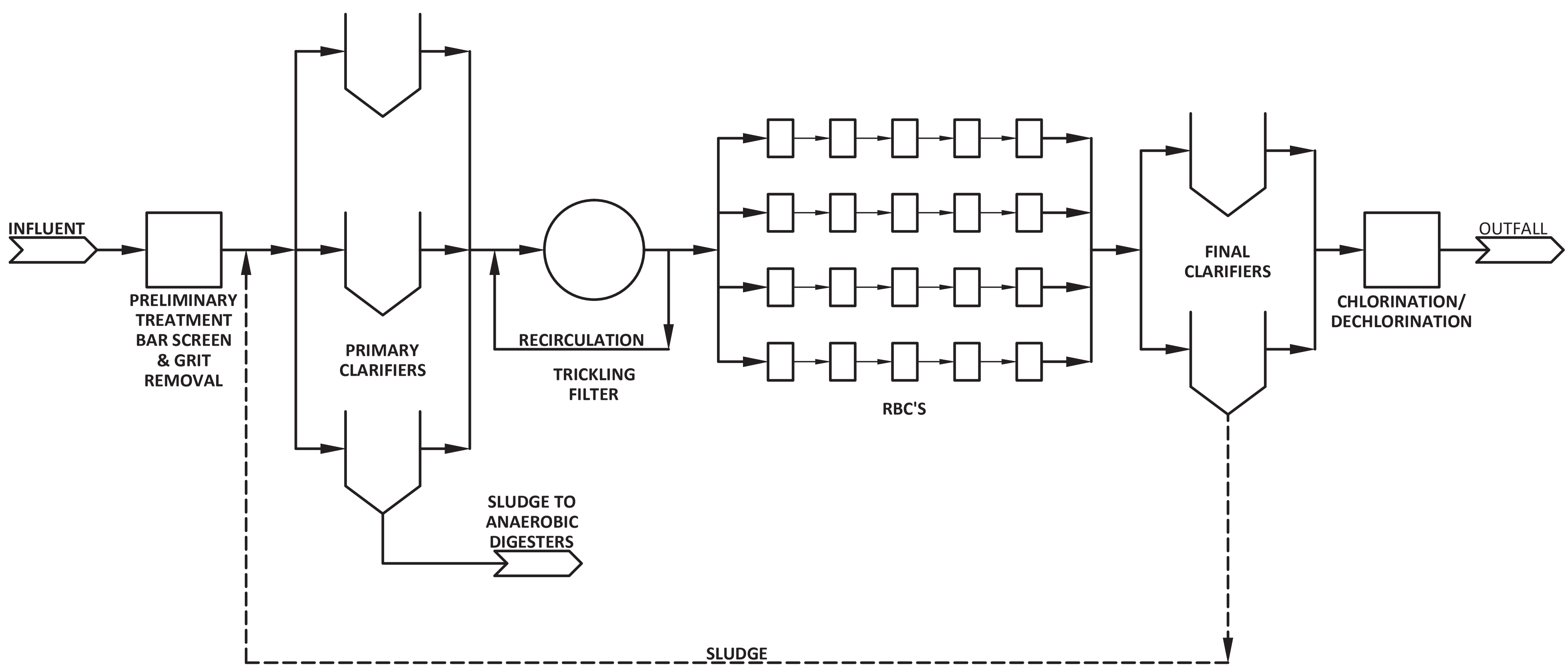

FIGURE 2.1
EXISTING PROCESS DIAGRAM

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The Webster City wastewater treatment facility currently receives wastewater from three significant industrial users (SIUs), summarized in Table 2.2. Discharges are from food processing facilities and one metals finisher. Monitoring parameters include flow, CBOD, TSS and TKN loadings for the food processors and typical metals for the metals finishing company.

Table 2.2 – Summary of SI 's			
Industry	**Description**	**Waste Load Monitorin Parameters**	**Planned Expan ion**
Mary Ann's Specialty Foods	Food Processor	CBOD, TSS, TKN, O&G, pH	Yes
Webster City Custom Meats	Food Processor	CBOD, TSS, TKN, O&G, pH	No
Mertz Engineering, Inc.	Metal Finisher	Zn, Cd, Cr, CN, Ni, Ag, TTO, Cu, Pb, pH	No

Information for two additional industries that do not cross the threshold for SIU classification but have treatment agreements in place with the City are presented in Table 2.3.

Table 2.3 – Summary of Other Ind stries with Treatment Agreements			
Industry	**Description**	**Waste Load Monitorin Parameters**	**Planned Expan ion**
Cactus Family Farms	Truck Wash Facility	CBOD, TSS, TKN	Yes
Natural Shrimp	Food Processor	CBOD, TSS, TKN	No

The City of Webster City is planning for residential population increase of 49% over the next 20 years. Future industrial growth is unknown but the City has elected to include 25% of the total plant capacity as reserve capacity for potential allocation to future industrial users.

B. Permit Violations

The Webster City WWTF incurred the following exceedances of NPDES permit limits over the review period of March 2016 through December 2020.

- August, September, October 2016 – TSS maximum concentration.
- November 2016 – TSS average and maximum concentration, Copper concentration and mass
- March 201 – pH maximum limit.
- May 2017 – Copper concentration and mass.
- October, August 2017 – E. Coli geometric mean.
- October 201 – E. Coli geometric mean, Total Residual Chlorine
- November 201 – Total Residual Chlorine
- February 2021 – Ammonia Nitrogen Average and Maximum Concentration

IDNR wastewater facility inspection reports from August 2017, July 2019, and March 2021 are located in Appendi B for reference.

Webster City Custom Meats and Mary Ann's Specialty Foods had periodic violations of treatment agreement limits over the review period. Both industries have requested increases in their discharge limits. The following is a brief summary of Treatment Agreement violations over the review period:

- Webster City Custom Meats
  - Several violations of treatment agreement limits over the review period including: Flow, BOD, TSS, TKN, O&G, and pH.
  - February 2020 – Webster City Custom Meats – Notice of Violation issued for treatment agreement limit violations.
- Mary Ann's Specialty Foods
  - Several violations of treatment agreement limits over the review period including: Flow, BOD, TSS, TKN, O&G, and pH.
  - November 2020 – Letter of Noncompliance issued for treatment agreement limit violations.

C. Design Parameters

1. Current Rated Plant Flows and Loadings

Table 2. provides a summary of the rated design capacity of the existing wastewater treatment facility as stated on Construction Permit Number 2000-2-s issued 10/05/1999.

Table 2.4 – Current Plant Rated Design Flows and Loadin s

Parameter	Design Capacity
Flow	
ADW	1.5 MGD
AWW	3.3 MGD
MWW	6.0 MGD
PHWW	--
BOD Loading	
Max. onth	4,150 lbs/d
Max. Day	4,150 lbs/d
TSS Loading	
Max. onth	--
Max. Day	--
TKN Loading	
Max. onth	400 lbs/d
Max. Day	400 lbs/d
Phosphorus	
Max. onth	--
Max. Day	--

2. Design Flows and Loadings

Table 2.5 provides a summary of the design flows and loadings that are used as the basis of the design for the proposed wastewater treatment facility improvements.

Table 2.5 – Design Year 2040 Flows and Loadings	
Parameter	**Design Capacity**
Flow	
ADW	1.989 MGD
AWW	4.586 MGD
MWW	9.430 MGD
PHWW	11.78 MGD
CBOD Loading	
Max. Month	7,446 lbs/d
Max. Day	10,665 lbs/d
TSS Loading	
Max. Month	8,104 lbs/d
Max. Day	12,845 lbs/d
TKN Loading	
Max. Month	845 lbs/d
Max. Day	1,155 lbs/d
Phosphorus	
Max. Month	145 lbs/d
Max. Day	334 lbs/d

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III. RECEIVING STREAM NETWORK

A. General

The existing treatment facility discharges treated wastewater to either the Boone River via an unnamed creek and ox bow lake (Outfall 001) or direct to the Boone River (Outfall 003). The Boone River is a tributary to the Des Moines River. The Des Moines River is a tributary to the Mississippi River.

Proposed improvements include constructing a new outfall to discharge directly to the Boone River downstream of Drainage Ditch No. 166 located approximately 1.5 miles downstream of the e isting Outfall 003. The City may also consider continued use of e isting Outfall 001. Table 3.1 presents stream designation for the Boone River. Based on the pollutants of concern, the use designations of waterbodies further downstream will not impact the resulting limits for this facility.

Table 3.1 – Stream Network Design tion

Stream	Design tion
Boone River	A1, B(WW-1), HH

The following is a summary of the designated uses as defined by the Iowa Water Quality Standards (IAC 567 Chapter 61):

- A1 – Primary contact recreational use – suitable for activities such as, but not limited to, swimming, diving, water skiing, and water contact recreational canoeing.
- B(WW-1) – Warm Water Type 1. Waters suitable to maintain warm water game fish populations along with a variety of native nongame fish and invertebrate species.
- HH – Human Health – Waters from which fish are harvested for human consumption on a routine basis or designated as a drinking water supply.

DNR developed a T DL for one segment of the Des River that addresses impairments for nitrate nitrogen. EPA approved this TMDL in 2009. The Webster City WWTF has a nitrate nitrogen load allocation from this TMDL and no other allocations.

The Boone River is listed on the 2018 impaired waters list along with the following waterbodies in the discharge route:

- Boone River – bacteria (indicator bacteria, E. coli
- Des Moines River – bacteria (indicator bacteria, E. coli), nutrients (nitrate nitrogen), fish kill (caused by other , and fish kill (due to unknown toxicity)
- Saylorville Reservoir – turbidity (Secchi disk transparency)
- Red Rock Reservoir – bacteria (indicator bacteria, E. coli and turbidity

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I . EFFLUENT LIMI ATI NS

A. General

The treatment facility is operated under NPDES Permit No. 4063001. The City's current NPDES permit was issued October 1, 2021 and last amended February 1, 2022. Current permit limits are summarized in Table 4.1 for discharge to an unnamed creek to an oxbow la e, the City's current primary discharge point. The oxbow lake discharges to the Boone River.

Table 4.1 – NPDES Discharge Limits – Webster City Current Permit Issued 10/21 – Outfall 001 (Oxbow Lake)			
Parameter	Season	Limit Type	Limit
$CBOD_5$	Yearly	7-day Ave.	40 mg/L (1,101 lbs/day)
	Yearly	30-day Ave.	25 mg/L (688 lbs/day)
TSS	Yearly	7-day Ave.	45 mg/L (1,238 lbs/day)
	Yearly	30-day Ave.	30 mg/L (826 lbs/day)
NH_3-N	Jan.	30-day Ave.	3.4 mg/L (94 lbs/day)
	Jan.	Daily Max.	15.2 mg/L (418 lbs/day)
	Feb.	30-day Ave.	4.0 mg/L (109 lbs/day)
	Feb.	Daily Max.	14.2 mg/L (391 lbs/day)
	Mar.	30-day Ave.	3.4 mg/L (94 lbs/day)
	Mar.	Daily Max.	14.7 mg/L (404 lbs/day)
	Apr.	30-day Ave.	1.5 mg/L (42 lbs/day)
	Apr.	Daily Max.	15.7 mg/L (432 lbs/day)
	May	30-day Ave.	1.7 mg/L (48 lbs/day)
	May	Daily Max.	15.2 mg/L (418 lbs/day)
	Jun.	30-day Ave.	1.3 mg/L (36 lbs/day)
	Jun.	Daily Max.	14.4 mg/L (397 lbs/day)
	Jul.	30-day Ave.	1.0 mg/L (28 lbs/day)
	Jul.	Daily Max.	17.6 mg/L (484 lbs/day)
	Aug.	30-day Ave.	1.0 mg/L (26 lbs/day)
	Aug.	Daily Max.	16.2 mg/L (447 lbs/day)
	Sep.	30-day Ave.	1.1 mg/L (29 lbs/day)
	Sep	Daily Max.	16.5 mg/L (454 lbs/day)
	Oct.	30-day Ave.	1.6 mg/L (43 lbs/day)
	Oct.	Daily Max.	15.7 mg/L (432 lbs/day)
	Nov.	30-day Ave.	2.3 mg/L (64 lbs/day)
	Nov.	Daily Max.	14.7 mg/L (404 lbs/day)
	Dec.	30-day Ave.	2.5 mg/L (68 lbs/day)
	Dec.	Daily Max.	16.0 mg/L (439 lbs/day)
Total Cadmium	Yearly	30-day Ave.	0.0004523 mg/L (0.01245 lbs/day)
	Yearly	Daily Max.	0.004316 mg/L (0.1188 lbs/day)
Total Residual Chlorine	Yearly	30-day Ave.	0.008 mg/L (0.216 lbs/day)
	Yearly	Daily Max.	0.019 mg/L (0.523 lbs/day)
Nitrate Nitrogen	Yearly	30-day Ave.	760 lbs/d
	Yearly	Daily Max.	1,244 lbs/d
Total Copper	Yearly	30-day Ave.	0.01687 mg/L (0.4642 lbs/d)
	Yearly	Daily Max.	0.02690 mg/L (0.7403 lbs/d)
Acute Toxicity, Ceriodaphnia	Yearly	Daily Max.	No Toxicity
Acute Toxicity, Pimephales	Yearly	Daily Max.	No Toxicity
pH	Yearly	Daily Max.	9.0
	Yearly	Minimum	6.5
E. Coli	Mar. – Nov.	Geo. Mean	630#/100 mL

Current permit limits are summarized in Table 4.2 for discharge to the Boone River, the City's current primary discharge point.

Table 4.2 – NPDES Discharge Limits – Webster City Current Permit Issued 10/21 – Outfall 003 (Boone River)			
Parameter	**Season**	**Limit Type**	**Limit**
$CBOD_5$	Yearly	7-day Ave.	40 mg/L (1,101 lbs/day)
	Yearly	30-day Ave.	25 mg/L (688 lbs/day)
TSS	Yearly	7-day Ave.	45 mg/L (1,238 lbs/day)
	Yearly	30-day Ave.	30 mg/L (826 lbs/day)
NH_3-N	Jan.	30-day Ave.	8.2 mg/L (214 lbs/day)
	Jan.	Daily Max.	16.1 mg/L (429 lbs/day)
	Feb.	30-day Ave.	9.4 mg/L (246 lbs/day)
	Feb.	Daily Max.	15.2 mg/L (403 lbs/day)
	Mar.	30-day Ave.	4.9 mg/L (128 lbs/day)
	Mar.	Daily Max.	15.4 mg/L (413 lbs/day)
	Apr.	30-day Ave.	3.6 mg/L (95 lbs/day)
	Apr.	Daily Max.	16.3 mg/L (439 lbs/day)
	May	30-day Ave.	3.2 mg/L (86 lbs/day)
	May	Daily Max.	15.8 mg/L (359 lbs/day)
	Jun.	30-day Ave.	2.2 mg/L (59 lbs/day)
	Jun.	Daily Max.	15.0 mg/L (234 lbs/day)
	Jul.	30-day Ave.	2.2 mg/L (58 lbs/day)
	Jul.	Daily Max.	12.2 mg/L (179 lbs/day)
	Aug.	30-day Ave.	2.0 mg/L (53 lbs/day)
	Aug.	Daily Max.	12.9 mg/L (184 lbs/day)
	Sep.	30-day Ave.	2.5 mg/L (66 lbs/day)
	Sep	Daily Max.	14.5 mg/L (215 lbs/day)
	Oct.	30-day Ave.	3.7 mg/L (97 lbs/day)
	Oct.	Daily Max.	16.4 mg/L (418 lbs/day)
	Nov.	30-day Ave.	5.6 mg/L (146 lbs/day)
	Nov.	Daily Max.	15.2 mg/L (411 lbs/day)
	Dec.	30-day Ave.	5.9 mg/L (155 lbs/day)
	Dec.	Daily Max.	16.6 mg/L (448 lbs/day)
Total Cadmium	Yearly	30-day Ave.	0.0006277 mg/L (0.01464 lbs/d)
	Yearly	Daily Max.	0.004474 mg/L (0.1208 lbs/d)
Total Residual Chlorine	Yearly	30-day Ave.	0.012 mg/L (0.274 lbs/d)
	Yearly	Daily Max.	0.020 mg/L (0.536 lbs/d)
Nitrate Nitrogen	Yearly	30-day Ave.	760 lbs/d
	Yearly	Daily Max.	1,244 lbs/d
Total Copper	Yearly	30-day Ave.	0.02177 mg/L (0.5256 lbs/d)
	Yearly	Daily Max.	0.02773 mg/L (0.7507 lbs/d)
Acute Toxicity, Ceriodaphnia	Yearly	Daily Max.	No Toxicity
Acute Toxicity, Pimephales	Yearly	Daily Max.	No Toxicity
pH	Yearly	Daily Max.	9.0 Std. Units
	Yearly	Minimum	6.5 Std. Units
E. Coli	Mar. – Nov.	Geo. Mean	126 #/100 mL

A Waste Load Allocation completed July 2022 includes the following additional effluent requirements:

- Less stringent effluent ammonia limits.
- New limits for dissolved oxygen, chloride, and sulfate.

Compliance with Iowa's Nutrient Reduction Strategy will also be required in the next NPDES discharge permit. The Web wastewater treatment facility must be upgraded to meet future effluent E. coli limits and to implement TN and TP removal to comply with the Iowa Nutrient Reduction Strategy.

Total nitrogen and phosphorus discharge limits will be established after eighteen months of new treatment process operations as per the Iowa Nutrient Reduction Strategy provisions.

Table 4.3 is a summary of projected discharge limits for the proposed outfall at the Boone River based on July 29, 2022 Waste Load Allocation calculations by IDNR staff.

Table 4.3 – WLA Limits – Webster City WLA Completed July 29, 2022			
Parameter	**Season**	**Limit Type**	**Limit**
$CBOD_5$ and TSS	Secondary Treatment Levels Will Not Violate WQs		
Total D.O.	Yearly	Minimum	4.2 mg/L
NH_3-N	Jan.	30-day Ave.	11.1 mg/L (257.7 lbs/day)
	Jan.	Daily Max.	15.9 mg/L (593.2 lbs/day)
	Feb.	30-day Ave.	12.7 mg/L (296.9 lbs/day)
	Feb.	Daily Max.	15.0 mg/L (556.3 lbs/day)
	Mar.	30-day Ave.	6.6 mg/L (154.7 lbs/day)
	Mar.	Daily Max.	15.4 mg/L (573.7 lbs/day)
	Apr.	30-day Ave.	4.9 mg/L (114.6 lbs/day)
	Apr.	Daily Max.	16.3 mg/L (611.1 lbs/day)
	May	30-day Ave.	5.6 mg/L (130.9 lbs/day)
	May	Daily Max.	15.8 mg/L (592.4 lbs/day)
	Jun.	30-day Ave.	4.2 mg/L (98.7 lbs/day)
	Jun.	Daily Max.	15.1 mg/L (563.6 lbs/day)
	Jul.	30-day Ave.	3.2 mg/L (75.6 lbs/day)
	Jul.	Daily Max.	18.3 mg/L (686.0 lbs/day)
	Aug.	30-day Ave.	3.1 mg/L (71.8 lbs/day)
	Aug.	Daily Max.	16.9 mg/L (633.2 lbs/day)
	Sep.	30-day Ave.	3.4 mg/L (79.5 lbs/day)
	Sep	Daily Max.	17.1 mg/L (642.4 lbs/day)
	Oct.	30-day Ave.	5.0 mg/L (117.4 lbs/day)
	Oct.	Daily Max.	16.3 mg/L (611.4 lbs/day)
	Nov.	30-day Ave.	7.5 mg/L (175.4 lbs/day)
	Nov.	Daily Max.	15.3 mg/L (571.8 lbs/day)
	Dec.	30-day Ave.	8.0 mg/L (186.7 lbs/day)
	Dec.	Daily Max.	16.6 mg/L (621.1 lbs/day)
Total Cadmium	Yearly	30-day Ave.	0.003237 mg/L (0.1015 lbs/d)
	Yearly	Daily Max.	0.01059 mg/L (0.3952 lbs/d)
Total Residual Chlorine*	Yearly	30-day Ave.	0.013 mg/L (0.403 lbs/d)
	Yearly	Daily Max.	0.022 mg/L (0.827 lbs/d)
Nitrate Nitrogen	Yearly	30-day Ave.	760 lbs/d
	Yearly	Daily Max.	1,244 lbs/d
Total Copper	Yearly	30-day Ave.	0.04111 mg/L (1.289 lbs/d)
	Yearly	Daily Max.	0.04773 mg/L (1.782 lbs/d)
Acute Toxicity, Ceriodaphnia	Yearly	Daily Max.	No Toxicity
Acute Toxicity, Pimephales	Yearly	Daily Max.	No Toxicity
pH	Yearly	Daily Max.	9.0 Std. Units
	Yearly	Minimum	6.5 Std. Units
E. Coli	Mar. – Nov.	Geo. Mean	126 #/100 mL
Chloride	Yearly	30-day Ave.	629 mg/L (19,940 lbs/day)
	Yearly	Daily Max.	735 mg/L (27,489 lbs/day)
Sufate	Yearly	30-day Ave.	2,142 mg/L (80,028 lbs/day)
	Yearly	Daily Max.	2,142 mg/L (80,028 lbs/day)

*TRC limits included because the current facility uses chlorine disinfection. Proposed improvements include UV disinfection in lieu of chlorine disinfection.

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V. POLLUTANTS OF CONCE N AND TIER PROTECTION LEVEL

A. General

Table 5.1 provides a summary of the pollutants of concern for the proposed wastewater treatment facility improvements.

Table 5.1 – Pollutants of Concern

Pollutant o Concern	Second ry Std. or WQBEL[1]	Bene icial Use Affected	Tier	Notes
Organic Matter (CBOD)	Secondary Std.	Aquatic life	2	See Table 6.2 for discharge alternative determinations of degradation
Suspended Solids (TSS)	Secondary Std.	General uses	2	See Table 6.2 for discharge alternative determinations of degradation
Ammonia-N	WQBE	Aquatic life	2	Compliance with WQBEL will not cause degradation.
Bacteria (E. coli	WQBE	Contact recreation	1	Boone River currently impaired – treat to standard.
Total Residual Chlorine (TRC)	WQBE	Aquatic life	2	Treat to standard (if chlorine disinfection utilized)
Chloride	WQBE	Aquatic life	2	No effluent limits based on reasonable potential to exceed standards.
Sulfate	WQBE	Aquatic life	2	No effluent limits based on reasonable potential to exceed standards.
Nitrate Nitrogen	WQBE	Aquatic lift (indirect) General uses (nuisance aquatic life)	1	T DL for one segment of Des Moines River
Total Nitrogen	--	Aquatic life (indirect) General uses (nuisance aquatic life)	2	No numeric standard. Pending effluent limits per Iowa Nutrient Reduction Strategy
Phosphorus	--	Aquatic life (indirect) General uses (nuisance aquatic life)	2	No numeric standard. Pending effluent limits per Iowa Nutrient Reduction Strategy
Organic Priority Pollutants	WQBE	Aquatic life	2	No effluent limits based on reasonable potential to exceed standards.
Cyanide	WQBE	Aquatic life	2	No effluent limits based on reasonable potential to exceed standards.
Metals	WQBE	Aquatic life Human health (indirect)	2	No effluent limits based on reasonable potential to exceed standards.

Notes: 1.WQBEL refers to water quality (standards based effluent limit.

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VI. IDE TIFCATION AND DISCUSSION OF ALTE NATIVES

A. General

The existing trickling filter and RBC treatment process is not suitable to meet all proposed discharge limits. The existing process includes primary clarifiers that remove approximately 40% of influent CBOD which results in insufficient carbon for denitrification. A new activated sludge treatment process (without primary treatment) is proposed to treat for TN and TP to meet Iowa Nutrient Reduction Strategy Criteria.

The Iowa Department of Natural Resources (IDNR) and the Iowa Department of Agriculture and Land Stewardship (IDALS) finalized the State of Iowa Nutrient Reduction Strategy in May 2013. The plan aims to reduce nitrogen and phosphorus discharge into Iowa waters and, ultimately, the Mississippi River and Gulf of Mexico. Increasingly stringent discharge limits for total nitrogen and phosphorus are anticipated. As numeric total nitrogen and phosphorus water quality standards are developed in order to accommodate more stringent future TP and TN discharge limits, the wastewater treatment facility improvements will be designed with provisions for future facility and process control modifications for more e tensive nitrogen and phosphorus removal.

Figure 6.1 is a process flow diagram for the proposed wastewater facility improvements – the Base Pollution Control Alternative (BPCA). The BPCA is the construction of a new extended aeration activated sludge facility with biological nitrogen and phosphorus removal. Specific facility improvements include construction of the following:

- Renovate e isting main lift station and aerated grit removal.
- Wastewater forcemain from existing plant site to proposed plant site.
- Preliminary treatment building with screenings and grit removal.
- Wet weather flow equalization basin.
- Anaerobic and Anoxic nutrient removal basins for University of Capetown (UCT) biological TN and TP removal process.
- Rapid mix basin for chemical phosphorus removal (backup process).
- Metal salt chemical feed for phosphorus removal (back-up process)
- Three (3) final clarifiers.
- UV disinfection
- New outfall to the Boone River
- Sludge thickening.
- Aerobic sludge digestion.
- Sludge dewatering and dewatered sludge storage bunker.
- Operations building including lab, offices and garage

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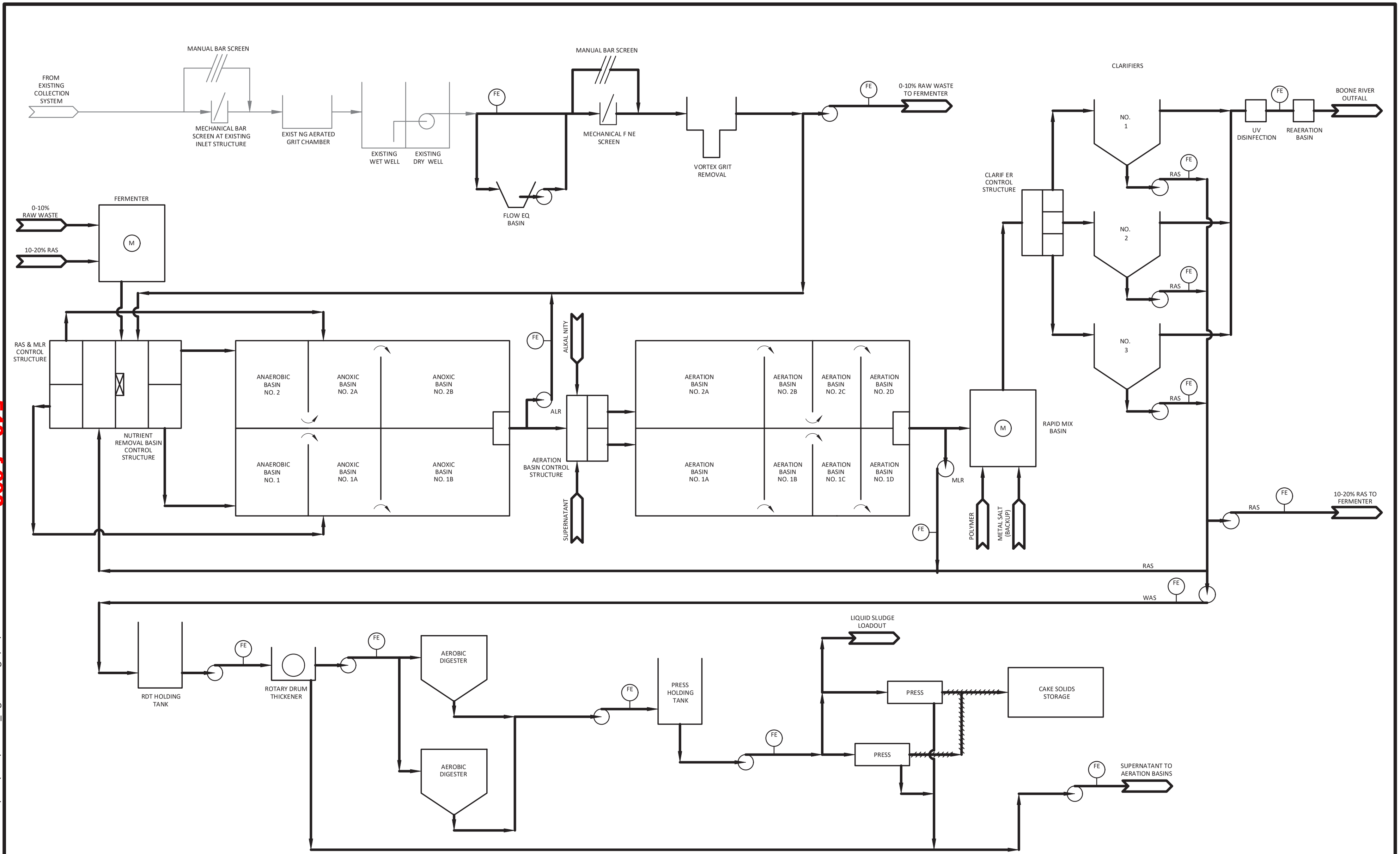

Webster City, Iowa
Antidegradation Alternatives Analysis
BPCA - UCT Process

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B. Alternative No. 1 – Recycle and Reuse

1. Industrial Applications

In industrial applications, the primary use of wastewater treated by secondary technologies is for non-contact applications such as cooling water. Both demand and practicality are important when evaluating the potential for this type of reuse.

The City of Webster City does not have any significant industrial users (SIUs) in town that could reuse effluent from the WWTF in their process.

From a practicality standpoint, wastewater is not the ideal source for cooling water applications. The cooling process typically generates an evaporative load that results in the concentration of minerals contained within the reused wastewater. This can lead to scaling issues in the cooling process equipment at the industry and also creates issues with the eventual discharge of the concentrated waste stream.

Due to low demand and potential issues with using treated wastewater as cooling water, industrial reuse is not considered feasible.

2. Non-Potable Domestic Applications

Non-potable domestic applications may include lawn and golf course irrigation, toilet flushing, car washing, and miscellaneous domestic outdoor uses. The primary downfall of these applications is the need for a separate non-potable distribution system and associated high infrastructure costs. Additionally, the demand for major outdoor reuse applications (i.e. irrigation) is highly seasonal and inconsistent on a day-to-day basis. Indoor uses such as toilet flushing are more consistent, but come with high costs to retrofit indoor plumbing systems.

Overall, the demand for reclaimed wastewater in non-potable domestic applications is a small percentage of the annual facility output. Coupled with high infrastructure costs related to constructing a non-potable water distribution and storage system, this type of reuse is not considered feasible.

3. Aquifer Injection

Under Iowa Administrative Code 567 IAC 62.9, disposal of pollutants into wells is prohibited within Iowa. This is interpreted to include the injection of treated wastewater effluent.

C. Alternative No. 2 – Land Application

Alternative No. 2 Land Application involves constructing a lagoon storage and a transmission system for land application of all wastewater produced in Webster City. Because the e isting treatment system cannot achieve future WQBELs for ammonia and nutrient reduction, all wastewater must be land applied in order for this alternative to be considered Less-Degrading compared to the BPCA. It is assumed all wastewater is land applied so this alternative can be considered Non-Degrading.

The existing RBC facility would be renovated and modified with the addition of lift stations and storage lagoons for land application. The proposed system includes construction of the following items:

- Renovate existing main lift station.
- Renovate existing trickling filter and RBC plant.
- Effluent lift station and forcemain to storage lagoons

- 7 storage lagoons
- Land application lift station
- Forcemain to application sites
- Spray irrigation equipment
- Purchase 320 acres for lagoons
- Acquire use of 5,950 acres for land application sites

The wastewater would be distributed by City-owned center pivot irrigation equipment and distributed onto City-owned agricultural land at agronomic nitrogen application rates based on 15 mg/L total nitrogen concentration. For this report, the application rate is assumed to be hydraulically limited at 10-inches/acre/year.

This alternative requires significant land purchases (320 acres) for storage lagoons as summarized in Table 6.1. A significant quantity of land (5,240 acres) must also be secured for land application. Obtaining permission for land application of wastewater to this amount of land near the storage lagoon facility is likely not feasible. If wastewater needs to be pumped long distances for land application, costs will be even further prohibitive. These factors generate significant uncertainty towards the reasonableness of this alternative, therefore this alternative was determined to be not practicable.

Table 6.1 – Alternative No. 2 – Land Application Lagoon Summary

	Number	Volume, Each (MG)	Total Volume (MG)	Retention Time (Days)	Total Area Required (Acres)
Storage Cells*	7	123	861	220	320

*Based on 85% AWW

D. Alternative No. 3 – Regional Treatment

1. Pump Wastewater to Neighboring Community

Alternative No. 3 Regional Treatment is only considered a non-degrading alternative (NDA) if the authority receiving Webster City's raw wastewater has adequate surplus capacity to treat the additional flows and loadings within their permitted design capacity. In this case, a separate anti-degradation review is not required.

Webster City is located near the northern boundary of Hamilton County. Cities located within 10 miles of Webster City include:

- Kamrar, 8.9 miles, controlled discharge three cell lagoon system.
- Blairsburg, 9.5 miles, controlled discharge two cell lagoon system.
- Duncombe, 9.2 miles, controlled discharge three cell lagoon system.
- Woolstock, 7.8 miles, controlled discharge three cell lagoon system.

None of the nearby towns have adequate treatment capacity to treat wastewater from the City of Webster City. Therefore, this alternative cannot be considered a non-degrading alternative because degradation will increase somewhere within or surrounding the watershed.

Regional treatment can potentially be considered a less degrading alternative (LDA) if

Webster City's wastewater is treated elsewhere in the watershed i.e. larger segment of the river . However, this would require the construction of a new facility. Due to their high proportion of total flows and loadings, the City of Webster City would have to pay a majority of the construction costs, as well as costs to build a pumping station, equalization basin, and force main in order to convey the wastewater to the new facility. This alternative has no economic advantages for the City; therefore, this alternative is not considered to be feasible.

E. Selection of Preferred Alternative

Table 6.2 presents a summary of the capital and operating cost opinions for the proposed new treatment facility concept BPCA) and the three less-degrading alternatives. Table 6.3 presents a summary of the BPCA and alternatives regarding degree of water quality degradation, economic efficiency, and practicality. The present worth cost analysis indicates that the less degrading alternatives did not pass the 115 percent of BPCA cost for consideration in lieu of the BPCA.

Table 6.2 – Alternatives and Present Worth Costs

Alt. No.	Description	Present Worth Cost[1]
BPCA	Activated Sludge Extended Aeration)	$11 ,309.00
1	Recycle/Reuse	Not Practicable
2	Land Application	Not Practicable
3	Regional Treatment	Not Practicable

1. Present Worth Cost is based on 2.25% discount rate and 20 years of service life. Discount rate is based on 18 CFR 704.39 as published at http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/econ/costs/ cid=nrcs143_009685

Table 6.3 – Impact of Reason ble Altern tives on Pollutants

Alt. No.	De ree of Degrad tion[1]	Reason ble Test			
		Practicable	Econo ic Efficienc [2]	Co t % o BPCA	Reason ble
BPCA	BPCA	Yes	Yes	--	Yes
1	NDA	No	N/A	N/A	N/A
2	NDA	Yes	No	N/A	No
3	NDA	No	N/A	N/A	N/A

1. BPCA refers to Base Pollution Alternative, NDA refers to Non Degrading Alternative, LDA refers to Less Degrading Alternative
2. Affordability of Less Degrading Alternatives is based on present worth costs of less than or equal to 115% of BPCA.

The BPCA – Extended Aeration Activated Sludge – is the only practicable alternative; thus, it is the most reasonable selection. Therefore, even though there may be some environmental benefits associated with the alternatives, the economic values of the potential environmental benefits are not greater than the increased capital costs of the alternatives.

Table 6.4 is a summary of the review of the BPCA on a pollutant-by-pollutant basis.

Table 6.4 – Summary of the Review of the BPCA on a Pollutant -by-Pollutant Basis		
Pollutant of Concern	**Degradation Potential BPCA**	**Comments**
CBOD	Yes	Effluent limits based on Secondary Standards. Removal efficiencies for CBOD are expected to increase when comparing the existing system to the BPCA. However, due to significant increase in design flow rate (+39% AWW), it is not certain that mass loading to the stream will decrease.
TSS	Yes	Effluent limits based on Secondary Standards. Removal efficiencies for TSS are expected to remain consistent with the existing system. However, due to design flow increase, it is likely that mass loading to the Boone River will increase.
Ammonia-N	No	Effluent limits for ammonia nitrogen are less stringent than the current limits due to increased background flow at the proposed outfall location but the actual ammonia N discharge may be reduced from current discharge quantities due to the improved performance of the proposed treatment process. The BPCA is designed with sufficient solids retention time to achieve nitrification. Ammonia removal efficiency for the BPCA will increase compared to the existing system, particularly at lower ambient temperatures. Enhanced ammonia removal is required to meet Total Nitrogen removal goals.
E. coli	No	Chlorine disinfection is currently provided and has shown to be slightly unreliable with a few E. Coli and TRC violations in the past. The BPCA includes a new UV disinfection system.
Chloride	Yes	Neither the existing treatment system nor the BPCA are designed to remove chloride or sulfate. The mass of these pollutants discharged to the Boone River will increase proportionally with flow over the design period.
Sulfate	Yes	
Total Nitrogen	No	The proposed extended aeration activated sludge alternative incorporates biological nitrogen and phosphorus removal – greatly increasing removal efficiencies compared to the existing system. Overall, there should be no degradation despite an increase in flow over the design period.
Total Phosphorus	No	
Priority Pollutants	Yes	The IAC includes numeric standards for 88 priority pollutants. The existing plant is required to test for cadmium (Cd) and copper (Cu). Proposed effluent limits for these two parameters are less stringent than current limits due to increased background flow at the proposed outfall location.

VII. JUSTIFICA ION OF DEGRADA ION

A. General

The proposed BPCA alternative will reduce the current and future degradation to the Boone River compared to the existing system through lower ammonia, total nitrogen, and total phosphorous loadings and improved disinfection. The extended aeration activated sludge treatment facility will be designed to meet 20-year projected design flows and loadings, including nutrient removal of nitrogen and phosphorus as required by the Iowa Nutrient Reduction Strategy. The facility will be designed to be readily expandable in order to accommodate additional flow and loadings as Webster City expands in the future.

The proposed increase in the design flowrate will result in an increase in the permitted discharge of the following pollutants: CBOD, TSS, Ammonia-Nitrogen, copper and mass coadmium.

The impacts of these increases in permitted pollutant discharges will have an insignificant impact on the receiving streams. The actual discharges of the some of these pollutants will be less than current discharge rates due to the improved treatment facility performance. The increases in design flowrate and subsequent minor degradation in receiving stream quality are justified by the City of Webster City economic viability and growth than results in increased wastewater generation by expanding population and industrial activity.

Since there is a potential for water quality degradation attributed to some pollutants of concern (due to increase in mass discharge limits for some regulated pollutants attributed to increases in the design flowrate for all pollutants), the social and economic impacts of the proposed plant expansion must be evaluated.

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VIII. PROJECT SOCIAL A D ECONOMIC IMPORTA CE

A. General

The City of Webster City anticipates an increase in population over the next 20 years of 3,795 people (increase of 49%) which will require additional treatment capacity beyond what is presently needed. It is more efficient to design and construct the additional capacity at this time, however, it is critical this project is economically feasible to provide reasonable rates for the current users so that the City's major industrial and commercial users may remain viable and provide employment opportunities to the residents of Webster City. There is significant competition for residential, commercial and industrial investment in rural Iowa and providing affordable and effective wastewater treatment is key to attracting future employment and residents to the community.

The project has social benefits to the City as it will decrease degradation to the Boone River, which has recreational and economic value. The project allows the City to meet NPDES permit requirements and provides critical infrastructure for future compliance. A summary of important social and economic parameters for the City of Webster City is provided in Table 8.1.

Table 8.1 – Social and Econo ic Factors for City o Webster City

Factor	Status	Notes	So rce	St te A erage
Rate of Unemployment	2.7%	Population 16 years and over in civilian labor force Hamilton County June, 2022	U.S. Bureau of Labor Statistics	2.6
Median Household Income	$54,531	2020	U.S. Census Bureau	$61,836
Poverty Level	6.15%	2020	U.S. Census Bureau	10.2%
Population Trends	-0.6	From 2010 to 2020	US Census Bureau	+4.7%
Sewer Revenue	Current $2,100,000 Projected $3,020,000	Projected monthly user bill with improvements: $150	City Financial Report (2022-23	Unknown

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Appendix A: Pubic Notice, Distribution List and Letters

Public Notice

Antidegradation Alternatives Analysis for the City of Webster City, Iowa

Notice Date: August 12, 2022

Notice is hereby given that the City of Webster City, Iowa has completed a draft antidegradation alternatives analysis for discharge of treated wastewater to the Boone River. The action being considered is construction of an extended aeration activated sludge wastewater treatment facility with biological nutrient removal. The Boone River is protected for Class A1 primary contact recreational, B(WW-1) warm water beneficial uses, HH human health.

Anyone wishing to comment on the proposed treatment alternative must do so in writing within 30 days of the date shown at the top of this notice. Comments may be submitted to the City Manager by mail: City of Webster City, Attn: Daniel Ortiz-Hernandez, 400 Second Street, PO Box 217, Webster City, IA 50595.

Copies of this notice, the draft antidegradation alternatives analysis and supporting information are on file and available for public inspection from 8:00 AM to 4:30 PM Monday through Friday at the above address. Copies of this information may be requested by contacting the City Administrator at (515) 832-9151 or at the address above. The City will submit a summary of comments received and the City's responses to the Iowa Department of Natural Resources with the final alternatives analysis subject to IDNR review and approval.

Distribution Sheet Addresses (May 2022)

Agency/Interested Party	Contact	Address	City/State/ZIP	Email	Notes
Notify all of these (see notes)					
US EPA Region VII	Tanya Nix	11201 Renner Blvd.	Lenexa, KS 66219	nix.tanya@epa gov	
US Fish and Wildlife Service	US Fish and Wildlife Service			rockisland@fws.gov	
Iowa Environmental Council	Ingrid Gronstal Anderson Michael Schmidt	505 5th Avenue, Suite 850	Des Moines, IA 50309	iecmail@iaenvironment.org gronstal@iaenvironment.org schmidt@iaenvironment.org	Notify by email with electronic copy of draft analysis if possible.
Environmental Law & Policy Center	Joshua T. Mandelbaum	505 5th Avenue, Suite 333	Des Moines, IA 50309	jmandelbaum@elpc.org	Notify by email with electronic copy of draft analysis if possible.
Iowa League of Cities	Alan Kemp	500 SW 7th Street, Suite 101	Des Moines, IA 50309-4111	alankemp@iowaleague.org	Municipal projects only
Notify the Field Office in which the facility is/will be located					
Iowa DNR Field Office 1	Shane Dodge, Supervisor	1101 Commercial Ct, Suite 10	Manchester, IA 52057		
Iowa DNR Field Office 2	Trent Lambert, Supervisor	2300 15th Street SW	Mason City, IA 50401		
Iowa DNR Field Office 3	Scott Wilson, Supervisor	1900 North Grand Ave., Suite E17	Spencer, IA 51301		
Iowa DNR Field Office 4	Jessica Montana, Supervisor	1401 Sunnyside Lane	Atlantic, IA 50022		
Iowa DNR Field Office 5	Ted Petersen, Supervisor	502 E. 9th Street	Des Moines, IA 50319-0034		
Iowa DNR Field Office 6	Kurt Levetzow, Supervisor	1023 West Madison Street	Washington, IA 52353		
Notify the County in which the facility is/will be located					
https://docs.google.com/spreadsheets/d/e/2PACX-1vSN9_vM3stj69X3-4qojMfxrkIGuP4dkCfZYo1DI9g8FSyJrs4SbfRYuDRPulMxStPClHPxdB1io1GR/pubhtml					
If the discharge impacts/will impact waters of another state, notify that state					
State of Illinois	Illinois Environmental Protection Agency, Water Pollution Control, Permit Section No. 15	1021 North Grand Ave. East, PO Box 19276	Springfield, IL 62794-9276		
State of Missouri	John Rustige, Department of Natural Resources, Division of Environmental Quality	1101 Riverside Drive	Jefferson City, MO 65101		
State of South Dakota	South Dakota Department of Environment & Natural Resources, Surface Water Quality Program	Joe Foss Building, 523 East Capitol Avenue	Pierre, SD 57501		
State of Nebraska	Department of Environmental Quality	1200 N Street, PO Box 98922	Lincoln, NE 68509-8922		
State of Minnesota	Minnesota Pollution Control Agency, Dave Sahli, P.E.	520 Lafayette Road North	St. Paul, MN 55155		
State of Wisconsin	Department of Natural Resources	Box 7921	Madison, WI 50307		

BOLTON & MENK
Real People. Real Solutions.

1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

August 12, 2022

Iowa DNR Field Office 2
Trent Lambert, Supervisor
2300 15th Street SW
Mason City, IA 50401

RE: City of Webster City Wastewater Facility Plan
Project No. A21.119239
Antidegradation Review – Public Notice

Dear Potentially Interested Party:

The Public Notice for the availability of a draft antidegradation alternatives analysis for discharge of treated water from the City of Webster City wastewater treatment facility to the Boone River is enclosed.

Please contact me with any questions regarding this Public Notice.

Sincerely,

Bolton & Menk, Inc.

Andrew D. Sindt, P.E.
Environmental Engineer

c: Daniel Ortiz-Hernandez – City of Webster City, w/enclosure
Biridiana Bishop – City of Webster City, w/enclosure
File

Enclosure

1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

Real People. Real Solutions.

Via email: rockisland@fws.gov

August 12, 2022

US Fish and Wildlife Service
1511 47th Avenue
Moline, IL 61265

RE: City of Webster City Wastewater Facility Plan
Project No. A21.119239
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1519 Baltimore Drive
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Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

Via email: iecmail@iaenvironment.org; gronstal@iaenvironment.org; schmidt@iaenvironment.org

August 12, 2022

Iowa Environmental Council
Attn: Ingrid Gronstal Anderson
521 E Locust Street, Ste 220
Des Moines, IA 50309

RE: City of Webster City Wastewater Facility Plan
Project No. A21.119239
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1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

Via email: james.oppelt@dnr.iowa.gov

August 12, 2022

Iowa Department of Natural Resources
James Oppelt
Wallace State Office Building
502 East 9th Street
Des Moines, IA 50319-003

RE: City of Webster City Wastewater Facility Plan
Project No. A21.119239
Antidegradation Review – Public Notice

Dear Mr. Oppelt:

The Public Notice for the availability of a draft antidegradation alternatives analysis for discharge of treated water from the City of Webster City wastewater treatment facility to the Boone River is enclosed.

Please contact me with any questions regarding this Public Notice.

Sincerely,

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Andrew D. Sindt, P.E.
Environmental Engineer

c: Daniel Ortiz-Hernandez – City of Webster City, w/enclosure
Biridiana Bishop – City of Webster City, w/enclosure
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1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

Via email: nix.tanya@epa.gov

August 12, 2022

US EPA Region VII
Attn: Tanya Nix
11201 Renner Blvd.
Lene a, KS 66219

RE: City of Webster City Wastewater Facility Plan
Project No. A21.119239
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Environmental Engineer

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Biridiana Bishop – City of Webster City, w/enclosure
File

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1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

Via email: jmandelbaum@elpc.org

August 12, 2022

Environmental Law & Policy Center
Attn: Joshua T. Mandelbaum
505 5th Ave, Ste. 333
Des Moines, IA 50309

RE: City of Webster City Wastewater Facility Plan
Project No. A21.119239
Antidegradation Review – Public Notice

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File

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1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

Via email: Alankemp@iowaleague.org

August 12, 2022

Iowa League of Cities
Attn: Alan Kemp
500 SW 7th Street, Ste 101
Des Moines, IA 50309-4111

RE: City of Webster City Wastewater Facility Plan
Project No. A21.119239
Antidegradation Review – Public Notice

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Real People. Real Solutions.

1519 Baltimore Drive
Ames, IA 50010-8783

Ph: (515) 233-6100
Fax: (515) 233-4430
Bolton-Menk.com

Via email: bradb@hamiltoncountypublichealth.com

August 12, 2022

Hamilton County Public Health
Attn: Brad Berg
1610 Collins Street, Suite 1
Webster City, IA 50595

RE: City of Webster City Wastewater Facility Plan
Project No. A21.119239
Antidegradation Review – Public Notice

Dear Potentially Interested Party:

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Andrew D. Sindt, P.E.
Environmental Engineer

c: Daniel Ortiz-Hernandez – City of Webster City, w/enclosure
Biridiana Bishop – City of Webster City, w/enclosure
File

Enclosure

The Daily Freeman-Journal

Affidavit of Publication

STATE OF IOWA, Hamilton County, ss.

I, Leanne Darr being duly sworn, do depose and say that I am clerk of The Daily Freeman-Journal, a Daily Newspaper of general circulation published at Webster City, Iowa, in said county of Hamilton, that the notice hereto attached was published in said newspaper on 8-18-22

and that the charge for the same was $ 23.81 Twenty three dollars 81/100 Dollars

Sworn and subscribed to by Leanne Darr before me this 18 day of August, 2022.

Annette Mackay

Notary Public for Hamilton County, Iowa.

NOTARIAL SEAL IOWA
ANNETTE MACKAY
Commission Number 830781
My Commission Expires
3-17-2024

LEGAL PUBLICATION

Public Notice
Antidegradation Alternatives Analysis for the City of Webster City, Iowa

Notice Date: August 12, 2022

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City of Webster City, Attn: Daniel Ortiz-Hernandez, 400 Second Street, PO Box 217, Webster City, IA 50595.

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L8415 8/18/22

Appendix B: DNR Inspection Reports

DEPARTMENT OF NATURAL RESOURCES

GOVERNOR KIM REYNOLDS
LT. GOVERNOR ADAM GREGG

DIRECTOR CHUCK GIPP

August 18, 2017

Ed Sadler, City Manager
City of Webster City
PO Box 217
Webster City, IA 50595

Subject: Wastewater Treatment Facility Inspection
Permit No. 4063001
Letter of Noncompliance – Sludge Recordkeeping

ATTENTION: Honorable Mayor and Council Members

Enclosed is a report of an inspection of your facility, which was conducted by Mr. Jeremy Klatt, Environmental Specialist of this office on August 9, 2017. I concur with the content of the report.

At the end of his report, Mr. Klatt has summarized his recommendations for facility operation improvements and stated required actions that must be completed in order to comply with the Iowa Administrative Code.

Please submit the monitoring report for the month of February 2017 no later than September 1.

If you have any questions concerning the report, please contact Mr. Klatt.

Sincerely,

FIELD SERVICES & COMPLIANCE BUREAU

Jeffrey B. Vansteenburg
Field Office Supervisor

JBV/jk

c: DNR Records Center

IOWA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL SERVICES DIVISION
WASTEWATER TREATMENT FACILITY INSPECTION

FACILITY NO. 4063001
PAGE 1

FACILITY	Name: Wastewater Treatment Plant	Owner: City of Webster City	
	Address: 400 2nd St. PO Box 217	City: Webster City, Iowa 50595	Phone: 515-832-3141
PLANT GRADE	☐ IL ☐ I ☐ IIL ☐ II ☒ III ☐ IV		
RESPONSIBLE OPERATOR	Name: Tim Danielson	Grade: III	Certification No. 9349
TREATMENT PROCESS	☒ Trickling Filter ☐ Lagoon ☒ Disinfection ☐ Activated Sludge => Modification: ☒ Other /Supplementary: RBC		
	Process Waste Description: Domestic and Industrial		
DESIGN CAPACITY	MGD: 3.3	Pounds BOD: 4150	PE (BOD): 24,412
NOW TREATING	MGD (Ave. Daily): 1.79 (3/16-6/17)	Pounds BOD: 2847 (3/16-6/17)	PE (BOD): 17,048
	Population Served: 8070 (2010 census)	Significant Industrial Contributors: ☒ Yes ☐ No Treatment Agreement(s) Adequate ☒ Yes ☐ No ☐ N/A	
RECEIVING STREAM	Stream Name: Oxbow Lakes Tributary to Boone River		
INSPECTION INFORMATION	Date of This Inspection: 08/09/2017	Time of This Inspection: 10 AM	Date of Previous Inspection: 09/21/2015 (EPA)
	Purpose of Inspection: Compliance Evaluation Inspection		
PERSONS INTERVIEWED	Name: Tim Danielson	Title: Public Works Director	
	Name:	Title:	
	Name:	Title:	
SIGNATURES	Inspector's Signature: [signature] Jeremy Klatt	Date: 8/18/17	Reviewer's Signature: [signature] David Miller — Date: 18AUG17

PERMIT COMPLIANCE SUMMARY

SELF-MONITORING	Operation Reports Submitted: ☒ Sat. ☐ Marg* ☐ Unsat.* ☐ N/A	Required Data Entered on Reports: ☒ Sat. ☐ Marg* ☐ Unsat.* ☐ N/A	Testing Adequacy: ☒ Sat. ☐ Marg* ☐ Unsat.* ☐ N/A
EFFLUENT LIMITATIONS	Self-Monitoring Results: ☒ Sat. ☐ Marg. ☐ Unsat.* ☐ N/A		
SAMPLES THIS INSPECTION	Type: None	Lab Data Attached: ☐ Yes ☒ No	
	Results: ☐ Sat. ☐ Marg. ☐ Unsat.* ☒ N/A		
	Visual Appearance of Effluent: Clear	Visual Appearance of Receiving Stream: Clear	
COMPLIANCE SCHEDULE	Compliance with Schedule: ☒ Sat ☐ Marg* ☐ Unsat.* ☐ N/A	Next Item Due: Progress Report	Date Due: 9/1/2017

Revised 01/09/13

IOWA DEPARTMENT OF NATURAL RESOURCES

WASTEWATER TREATMENT FACILITY INSPECTION

FACILITY NO. 4063001
PAGE 2

FACILITY EVALUATION

Were deficiencies noted or significant observations made during the inspection?
Yes = See Comments Section for details
No = No deficiencies or significant observations were noted.
Lack of entry = Item not applicable or not observed.

ITEM	YES	NO		YES	NO
1. COLLECTION SYSTEM			9. SLUDGE HANDLING AND DISPOSAL		
a. Operation and Maintenance	☐	☒	a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒	b. Physical Condition	☒	☐
c. Dry Weather Capacity	☐	☒	c. Capacity	☐	☒
d. Infiltration/Inflow	☐	☒	d. Effectiveness	☐	☒
e. By-pass	☒	☒	e. Final Disposal, Solids	☒	☐
			f. Final Disposal, Liquids	☒	☐
2. LIFT STATION(S) (COLLECTION SYSTEM)					
a. Operation & Maintenance	☐	☒	10. LAGOON STRUCTURES ( )		
b. Physical Condition	☐	☒	a. Maintenance	☐	☒
c. Capacity	☐	☒	b. Physical Condition	☐	☒
d. Reliability/Emergency Operation	☐	☒	c. Capacity	☐	☒
3. INDUSTRIAL WASTE PRE-TREATMENT			d. Cell Configuration	☐	☒
a. Waste Toxicity/Compatibility	☒	☐	e. Storage/Drawdown Management	☐	☒
b. Strength Reduction	☐	☒	11. FLOW MEASUREMENT		
c. Affect on Treatment Plant	☐	☒	a. Operation & Maintenance	☐	☒
4. PRE-TREATMENT UNITS (this facility)			b. Capacity	☐	☒
a. Operation & Maintenance	☒	☐	c. Continuity	☐	☒
b. Physical Condition	☐	☒	d. Location/Method/Effectiveness	☐	☒
c. Capacity	☐	☒	12. PUMPING		
d. Effectiveness	☐	☒	a. Operation & Maintenance	☐	☒
5. PRIMARY TREATMENT			b. Physical Condition	☐	☒
a. Operation & Maintenance	☒	☐	c. Capacity	☐	☒
b. Physical Condition	☐	☒	d. Reliability/Emergency Operation	☐	☒
c. Capacity	☐	☒	13. MISCELLANEOUS		
d. Sludge/Scum Removal	☐	☒	a. Location	☐	☒
e. Effectiveness	☐	☒	b. Odors	☐	☒
6. SECONDARY TREATMENT			c. Emergency Operation	☐	☒
a. Operation & Maintenance	☒	☐	d. By-pass(es)	☐	☒
b. Physical Condition	☒	☐	e. Equipment	☐	☒
c. Capacity	☐	☒	f. Buildings & Grounds	☐	☒
d. Recirculation	☐	☒	g. Other **(Lab Certification)**	☒	☐
e. Freezing	☐	☒	14. STAFFING, OPERATOR CERTIFICATION		
f. Effectiveness	☐	☒	a. Operator, Direct Responsibility	☐	☒
7. FINAL SETTLING			b. Shift Operator(s)	☐	☒
a. Operation & Maintenance	☐	☒	c. General Staffing	☒	☐
b. Physical Condition	☐	☒	15. SUPPLEMENTARY		
c. Capacity	☐	☒	a. Permit Availability	☐	☒
d. Effectiveness	☐	☒	b. Operation Reports Availability	☐	☒
8. SUPPLEMENTARY TREATMENT			c. Equipment Records Maintenance	☐	☒
a. Operation & Maintenance	☐	☒	d. Previously Noted Deficiencies	☐	☒
b. Physical Condition	☐	☒	e. Improvements	☒	☐
c. Capacity	☐	☒	f. Domestic/Industrial Growth	☐	☒
d. Effectiveness	☐	☒	g. Recommendations	☒	☐
			h. Required Actions	☒	☐

FACILITY DESCRIPTION

The wastewater treatment facility consists of 2 barscreens, comminutor (Muffin Monster), 2 aerated grit chambers, 2 pumping stations, 3 primary clarifiers, 1 trickling filter, 20 RBC units, 2 final clarifiers, chlorine detention tank (2 chlorinators), dechlorination with sodium bisulfite, 1 fixed-cover primary anaerobic digester (heated), 1 floating cover secondary digester, gas recirculation, heat exchanger, 2 sludge drying beds and a 1.2 million gallon sludge storage tank. Specifications for process equipment are on file at the treatment plant and at the DNR Field Office in Mason City.

PERMIT COMPLIANCE SUMMARY

Discharge from this facility is authorized by NPDES Permit No. 40-63-0-01, which was issued March 1, 2016, and will expire on February 28, 2021. The City has the ability to discharge at two separate locations; this is reflected in the new permit. Outfall 001 is the discharge to the Oxbow Lakes, which flow to the Boone River while Outfall 003 is a direct discharge to the Boone River. Limits for some parameters change based on the location of discharge.

The monthly operation reports (MOR's) were reviewed for compliance since the issuance of the new permit (March 2016-June 2017). During this period, the City discharged exclusively to Outfall 001. The following permit effluent violations were reported during the reviewed period:

Copper – Concentration and mass violations occurred in November of 2016 and May of 2017.

E. coli – The geomean limit was exceeded in August of 2016.

pH – The maximum pH limit was exceeded in March of 2017.

Total Suspended Solids – The average and maximum concentration limits were exceeded in November of 2016. Additionally, the maximum TSS concentration limit was exceeded in August, September and October 2016. Lastly, the maximum mass limit was exceeded in September of 2016.

Annual toxicity testing was completed in July of 2016; the effluent passed both toxicity tests. The 2017 toxicity was recently taken and results have not been received.

The City inadvertently sent a blank monitoring report for February of 2017. Please update and resubmit the February 2017 monitoring report.

Compliance Schedule

The new permit has a compliance schedule for meeting limits for cadmium, copper, silver, zinc, and total residual chlorine. The facility was required to submit a compliance strategy by September of 2016. This report was submitted in February of 2017 and indicated that the existing equipment will be evaluated to determine if the TRC limit can be met without upgrades. For metals, a site-specific study will be conducted in hopes of revising the limits. However, the City is currently contemplating a plant upgrade to an activated sludge treatment system (see item 15e).

Nutrient Reduction Strategy

The City of Webster City is also subject to the State's Nutrient Reduction Strategy. The permit requires that the City submit a report that evaluates the feasibility and reasonableness of reducing the amounts of nitrogen and phosphorus discharged into surface water. The report is due by March 1, 2018.

FACILITY EVALUATION

1-e Bypassing

Bypassing occurred on March 7, 2017, due to a power outage at the plant. The power was out for about 60 minutes and sewage flowed out of a manhole near the plant. Once power was restored the bypass subsided.

3-a Industrial Pretreatment

The City has TAs with Mary Ann's Specialty Foods (Mary Ann's) and Webster City Custom Meats (Custom Meats). The monitoring data for both industries was reviewed for the period of March 2016 to June 2017. Custom Meats exceeded BOD loading limits in two months, flow limits in two months, pH limits during seven months and TKN during one month. Mary Ann's exceeded BOD limits during two months, flow limits during four months, pH limits during eight months, TKN limits during two months and TSS limit during one month.

VeroBlue, a fish grower/processor has purchased a portion of the old Electrolux facilities in Webster City and is currently growing fish. The City has a treatment agreement with the industry, though the industry is not a 'Significant Industrial User' and therefore, the agreement was not incorporated into the permit. VeroBlue does plan to begin processing fish in the facility. If the processing results in being designated as a Significant Industrial User, the treatment agreement must be submitted to the DNR wastewater section for review and inclusion in the permit

Mr. Danielson indicated that he anticipates reworking the agreements for Mary Ann's and Custom Meats in the near future as plans to expand the facility progress.

4a Pre-treatment

Grit is placed in a drying bed for dewatering and then is mixed with woodchips and stockpiled across the street and the City's compost operation. There was a significant accumulation of grit in the drying beds at the time of inspection. Grit must be ultimately disposed either by land application in accordance with Chapter 567 IAC 121, after meeting pathogen reduction and vector reduction requirements, or by disposal at the landfill. If the City decides to land apply the grit, contact the DNR field office for land application requirements.

5a Primary Clarifier

One of the City's three primary clarifiers is being rebuilt with new concrete walls, weirs, and troughs and is currently out of service. Mr. Danielson indicated that the construction crew is waiting on baffles and weirs to finish the project. Construction Permit No. 2016-0356-S was obtained for the project.

6-a,b Secondary Treatment

Four of the 20 RBC units are currently not operational. As of now, the City is not intending to make repairs to these units as they prepare to upgrade secondary treatment to activated sludge. Should the City decide against the plant upgrade, these units will need to be repaired.

9-b,e Biosolids Disposal

The primary digester is also under repair and is currently not being used; this work was also authorized by Construction Permit No. 2016-0356-S. Past sludge report records have indicated that the pathogen reduction is met by achieving the required detention time in the anaerobic digester; however, Mr. Danielson reported that he has never seen the calculation to document that the detention time is adequate.

With the primary digester out of commission, it is unlikely that the required detention time is being achieved. The City must either demonstrate that the required detention time is achieved or meet the pathogen reduction requirement by other means.

The 5-year application was completed by V & K Engineering in May of 2016 and the report recommends that the City demonstrate pathogen reduction by calculating the geometric mean of fecal coliform of seven samples of the sewage sludge and showing a concentration of less than 2,000,000 MPN/gram. I recommend that that the City begin using this method annually, as the City has not calculated the detention time in the digester.

Sludge was hauled in the fall of 2016 and the sludge application records were reviewed. The sludge was sampled for pollutants required in Chapter 67 and all pollutants were below ceiling concentrations. Vector reduction was met by injecting the sludge below the soil surface. The report indicated that pathogen reduction was met by detention time in the anaerobic digester.

Mr. Danielson was not able to locate the 2015 sludge application records, although the results of the sludge sampling were located in the May 2016, 5-year sludge plan. All pollutants were below ceiling limits in the samples taken both in March and October of 2015. The City must ensure that all sludge application records are maintained on-site for five years (the required recordkeeping items are attached to this report).

9f Sludge Drying Beds

The previous inspection report noted that the City also disposes of grit, etc. from sewer cleaning in the sludge drying beds. In March of 2013, the City asked the Department about disposal of this material in their dead animal (road kill) compost pile. At that time the Department notified the City that this material must be handled in accordance with the sewage sludge regulations. See Item 4a above regarding disposal options.

13-g Laboratory Certification

There has been no change in the laboratories used for the various analyses required by this facility. The City's lab, AgSource Labs, and SHL, are all being used and remain certified.

14-c General Staffing

Tim Danielson was named Public Works Director in July 2011 and is the responsible operator for the facility. Mr. Danielson currently is certified as a Grade III wastewater operator.

15e Improvements

The City is making plans to expand their wastewater treatment facility. A project initiation meeting between the City and the DNR occurred in December of 2016 (DNR Project # 2017-0216A). Mr. Danielson reported that the City currently is hoping to construct new secondary treatment facilities at a new location, south of Highway 20. Preliminary treatment and primary clarification would occur at the current facilities.

RECOMMENDATION

1. To meet pathogen reduction requirements, take seven fecal coliform samples during sludge hauling and calculate a geomean.

2. Contact the DNR Field Office if grit from the drying beds will be land applied.

REQUIRED ACTIONS

1. Comply with all effluent limitations in the permit per Subrule 567 IAC 64.3(1).

2. Submit the monitoring report for February 2017 per Subrule 567 IAC 64.3(1).

3. Continue to enforce the treatment agreement with industrial contributors per Subrules 567 IAC 64.3(1) and 567 IAC 62.1(6).

4. Ensure the pathogen reduction requirement is being met for application of sewage sludge per Subrule 567 IAC 67.8(1).

5. Maintain sludge application records for five years per Subrule 567 IAC 67.8(4).

6. Properly dispose of grit accumulations in the drying bed by either land application or at the landfill per Rule 567 IAC 100.4 (455B).

IOWA DEPARTMENT OF NATURAL RESOURCES

GOVERNOR KIM REYNOLDS
LT. GOVERNOR ADAM GREGG
DIRECTOR KAYLA LYON

October 14, 2019

City of Webster City
City Hall, P.O. Box 217
Webster City, IA 50595

Subject: Wastewater Treatment Facility Inspection, Permit No. 4063001
Notice of Violation – Compliance Schedule, Effluent Limits

ATTENTION: Honorable Mayor and Council Members

Sheila Kenny, Environmental Specialist with this office, conducted an inspection of your facility on July 16, 2019. A field inspection report was completed and is enclosed for your file. I concur with the content of the report.

At the end of this report, Ms. Kenny has summarized her recommendations for facility operation improvements and stated required actions that must be completed in order to comply with the Iowa Administrative Code. Failure to comply can result in referral to the Department's Legal Services Section for consideration of enforcement action.

Please submit a written response to this office within **30 days of receipt** of this letter, stating the measures you have taken, or will take, to comply with the required actions.

If you have any questions concerning the report, please contact Ms. Kenny at 641-424-4073.

Sincerely,

FIELD SERVICES & COMPLIANCE BUREAU

Trent Lambert
Field Office Supervisor

TL/sk

Enclosure: Effluent Limits Violations Reports
Section 13.11 of the Iowa Wastewater Facilities Design Standards

c: DNR Records Center

FIELD OFFICE 2, 2300 15TH ST SW, MASON CITY IA 50401
Phone: 641-424-4073 www.iowadnr.gov Fax: 641-424-9342

Iowa Department of Natural Resources
Wastewater Treatment Facility Inspection Form

NPDES Permit #: 4063001 **Page 1**

FACILITY INFORMATION

Facility:
Name: **Webster City Wastewater Treatment Facility** Plant Grade: **WW-III**
Responsible Authority/Owner: **City of Webster City**
Address: **City Hall, P.O. Box 217** Phone: **515-832-9185**
City: **Webster City** State: **IA** Zip: **50595**

Responsible Operator:
Name: **Tim Danielson** Grade: **WW-III** Certification Number: **9349**

General Description:
This facility consists of a collection system with 3 lift stations and a treatment plant comprised of the following units or processes: a comminutor, a bypass channel with a bar screen, an aerated grit chamber, cyclone grit removal and grit washer, 3 primary clarifiers, 1 uncovered trickling filter, 20 rotating biological contactors (RBCs) arranged in 5 trains of 4 with aeration, 2 final clarifiers, a chlorine contact chamber with gas chlorination, and sodium bisulfite feed for dechlorination. Sludge is stabilized in a primary anaerobic digester with a fixed cover and a secondary digester with a floating cover. Sludge may be dried in the sludge drying bed or stored in a 1.2 million gallon storage tank prior to disposal by land application.

Design Capacity:
Average MGD: **3.300** Maximum MGD: **6.00**
Pounds BOD/Day: **4150** PE (BOD): **24,850**

Now Treating:
Average MGD: **1.910** Maximum MGD: **7.887**
Pounds BOD/Day: **3714** PE (BOD): **22,237**
Period Reviewed: **August 2017-June 2019** Population Served: **8070 (2010 Census)**

Receiving Stream:
Outfall 001 - Unnamed tributary to Oxbow Lake, Tributary to the Boone River
Outfall 003 – Boone River

INSPECTION INFORMATION

Inspection:
Date and Time of Inspection: **07/16/19 – 1pm** Purpose: **Compliance Evaluation**
Date of Last Inspection: **08/09/17**

Persons Interviewed:
Name: **Tim Danielson** Title: **Wastewater Superintendent**

NPDES PERMIT COMPLIANCE SUMMARY

Self-Monitoring:
Operation Reports Submitted: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Required Data on Reports: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Testing Adequacy: ☒ Sat. ☐ Marg.* ☐ Unsat.*

Effluent Limitations:
Self-Monitoring Results:
☐ Compliance ☒ Infrequent Non-Compliance* ☐ Significant Non Compliance*

Samples this Inspection:
Type: **None** Lab Data Attached? ☐ Yes ☒ No Results: ☐ Sat. ☐ Marg.* ☐ Unsat.*

Visual Appearance of Effluent: **Clear**
Visual Appearance of Receiving Stream: **Clear**

Compliance Schedule:
Compliance w/Schedule:
☐ Sat. ☐ Marg.* ☒ Unsat.* ☐ NA Next Items Due: **Submit Progress Report for Nutrient Reduction Schedule by 03/01/2020. Progress reports for the metals schedule were due 06/01/18 and 06/01/19.**

* Additional details in the narrative report

AUTHENTICATION

Inspector: Sheila Kenny *Sheila Kenny* Date: **10/14/19**
Reviewer: David Miller *[signature]* Date: 17 OCT 19

Updated 10/22/2015 cmc

DNR Form 542-3158

NPDES Permit #: 4063001

FACILITY EVALUATION

Were deficiencies noted or significant observations made during the inspection?

Yes = See Comments Section for details
No = No deficiencies or significant observations were noted
Lack of Entry = Item not applicable or not observed.

Item	Yes	No
1. Collection System		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Dry Weather Capacity	☐	☒
d. Infiltration/Inflow	☒	☐
e. Bypass(es)	☒	☐
2. Lift Station(s) (Collection System)		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/Emergency Operation	☒	☐
3. Industrial Waste Pre-Treatment		
a. Significant Industrial Users	☒	☐
b. Waste Toxicity/ Compatibility	☐	☒
c. Strength Reduction	☐	☒
d. Effect on Treatment Plant	☐	☒
4. Preliminary Treatment		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
5. Primary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Sludge/Scum Removal	☐	☒
e. Effectiveness	☐	☒
6. Secondary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Recirculation	☐	☒
e. Freezing	☐	☒
f. Effectiveness	☐	☒
7. Final Settling		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
8. Supplementary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒

Item	Yes	No
9. Sludge Handling and Disposal		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
e. Final Disposal, Solids	☐	☒
f. Final Disposal, Liquids	☐	☒
10. Lagoon Structures		
a. Maintenance	☐	☐
b. Physical Condition	☐	☐
c. Capacity	☐	☐
d. Cell Configuration	☐	☐
e. Storage/Drawdown Management	☐	☐
11. Flow Measurement		
a. Operation and Maintenance	☒	☐
b. Capacity	☐	☒
c. Continuity	☐	☒
d. Location. Method/ Effectiveness	☐	☒
12. Pumping		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/ Emergency Operation	☐	☒
13. Miscellaneous		
a. Location	☐	☒
b. Odors	☐	☒
c. Emergency Operation	☒	☐
d. Bypass(es)	☐	☒
e. Equipment	☐	☒
f. Buildings & Grounds	☐	☒
g. Lab Certification	☐	☒
h. Other	☐	☐
14. Staffing, Operator Certification		
a. Operator, Direct Responsibility	☐	☒
b. Shift Operator(s)	☐	☒
c. General Staffing	☐	☒
15. Supplementary		
a. Permit Availability	☐	☒
b. Operation Reports Availability	☐	☒
c. Equipment Records Maintenance	☐	☒
d. Previously Noted Deficiencies	☐	☒
e. Improvements	☐	☒
f. Domestic/Industrial Growth	☐	☒
g. Recommendations	☒	☐
h. Required Actions	☒	☐

INTRODUCTION

A compliance inspection was conducted at the Webster City WWTP on July 16, 2019. The inspection involved a review of City records, discussions with the operator identified above, and a walk through of the treatment plant. The purpose of the inspection was to determine the compliance status of the facility.

NPDES PERMIT COMPLIANCE SUMMARY

Discharge from this facility is authorized by NPDES permit #4063001. The NPDES permit was issued on March 1, 2016, and has an expiration date of February 28, 2021.

Self-Monitoring Results
Refrigerated composite samplers are used to collect 24-hour composite samples of the influent and effluent flow at this facility. There are effluent samplers pre- and post-disinfection, but Mr. Danielson reported that the post-disinfection sampler was down for a few weeks while they awaited the necessary parts to repair it. In the interim, they have been reporting result from the pre-disinfection sampler. The City should work to repair the sampler and return it to service as soon as possible. The tubing in the composite samplers should be watched closely for bacterial growth as dirty lines may lead to higher sample results that are not representative of the typical wastewater at this facility. Mr. Danielson stated that they clean the tubing on both samplers as needed.

Operational monitoring and compliance sample analysis for BOD_5, $CBOD_5$, TSS, SS, NH_3-N, TRC, pH, DO, and temperature is conducted at the certified in-house laboratory (Iowa Lab #314). Samples for NO_3-N, TKN, Total N, Total P, metals, toxicity, and *E. coli* are taken to the State Hygienic Laboratory in Ankeny (Iowa Lab #397) for analysis. Samples are hand-delivered to comply with the 6-hour maximum hold time for *E. coli*.

To ensure accurate readings, Mr. Danielson reported that they perform a three-point (4.0, 7.0, and 10.0) calibration of the pH meter and measure a known TRC standard five days per week. They also have a certified thermometer in the lab. Proper calibration logs are being maintained to document these calibration activities in accordance with Subrule 567 IAC 63.2(1).

The operation reports submitted for this facility since August 2017 indicate that there were two minor violations of the effluent TRC limits and three significant violations of the effluent *E. coli* limit. See the enclosed Effluent Limit Violations report for details. The discharge of untreated or partially treated wastes which exceed permit effluent limits is a violation of Subrule 567 IAC 64.3(1), and is prohibited by Section 455B.186 of the Code of Iowa. Action should be taken to ensure that further violations do not occur. Mr. Danielson reported that they made some physical changes to the chlorine room in April 2019 as the piping layout and equipment failures were the primary causes of these violations. **As a reminder, Rules 567 IAC 63.12(455B) and 63.15(455B) require that all permittees report instances of non-compliance, including violations of effluent limitations, to the Department.** See permit conditions 13 and 14 for additional information.

Operation Reports Submitted; Required Data Entered on Reports
The operation reports were submitted on time and all required data was reported. All operation records, including Monthly Operation Reports (MORs), lab results, and chain-of-custody documents must be maintained for a minimum of three years. The City is maintaining both paper and electronic records for this facility. The MORs have been signed in accordance with the rules, but Mr. Danielson was encouraged to also date the MORs so that an accurate timeline can be established in the records.

Compliance Schedules
The current NPDES permit for Webster City contains a compliance schedule to meet more stringent effluent limits for metals and a construction schedule for nutrient reduction. Mr. Danielson reported that they have been working with Greg ...dt, P.E. from Bolton & Menk, on designing a new activated sludge plant.

The metals compliance schedule requires annual progress reports on June 1 of each year; however, to date, the Department has not received the progress reports for 2018 or 2019. The implementation schedule and the first progress report were both submitted more than 90 days after the due date as well. **Therefore, the City is current in significant non-compliance for failure to follow the compliance schedule and must submit a progress report immediately.** Mr. Danielson indicated that the City is in the process of collecting stream sampling data in order to request site-specific limits for metals. The City should ensure that they are moving forward with this project in order to meet the final compliance deadline of February 1, 2021.

The construction schedule for nutrient reduction requires annual progress reports on March 1 of each year. The 2019 report indicates that the City is working with industrial users to determine appropriate design flows and loading rates. The City must complete construction of the necessary upgrades by March 1, 2024. The City will then have a six-month optimization period followed by a one-year monitoring period before final nutrient limits are established.

FACILITY EVALUATION

1d. COLLECTION SYSTEM – Infiltration/Inflow

Infiltration is the entrance of extraneous clear water into the collection system via loose joints, cracked or broken pipes, poorly constructed manholes, etc. Inflow is the entrance of extraneous clear water into the collection system via improper connections such as storm sewers, foundation drains, roof drains, etc. Infiltration and inflow (I/I) increase the cost of operation and maintenance of the lift stations and treatment facility. Influent flows exceeding the facility's design capacity shorten the detention time and may make compliance with your permit's effluent limits more difficult. Mr. Danielson indicated that they do see increased flows after rainfall events and the data provided since the previous inspection indicates flows of up to 7.519 MGD, which exceeds the maximum wet weather design flow for this facility. Therefore, it is recommended that the City continue to identify and eliminate sources of infiltration/inflow to the collection system. City ordinances that prohibit sump pumps and roof drains from being discharged into the sanitary sewer are also recommended and should be enforced. Mr. Danielson reported that the City conducted sump pump inspections about 4-5 years ago and disconnected any illegal connections they discovered. He also stated that the City has money budgeted each year for televising and repairs to the collection system.

1e. COLLECTION SYSTEM – Bypasses

A wastewater bypass occurred in April 2018 due to a power outage. As a reminder, bypassing is prohibited under Rule 567 IAC 63.6(455B); therefore, the City should work to prevent all future bypasses. Written bypass reports are now required to be submitted within five days following a bypass event. An electronic report form is now available for use upon request.

2a. and 2d.LIFT STATION

There are three lift stations in town to pump all wastewater to the treatment plant. Mr. Danielson reported that each lift station is equipped with two pumps that are automatically alternated to distribute the wear between the pumps and ensure that both pumps are working properly. The lift stations are equipped with autodialer alarm systems which will call the operator should a problem arise, but Mr. Danielson reported that they do not have emergency generators at the lift stations. **Section 13.11 of the Iowa Wastewater Facilities Design Standards requires that all lift stations have an emergency means of operation such as a generator or redundant power supply, which can be in place within 30 minutes following a power outage.** The City must submit information detailing how they will comply with this requirement.

3a. SIGNIFICANT INDUSTRIAL USERS (SIUs)

The City currently has treatment agreements for two significant industrial users – Mary Ann's Specialty Foods and Webster City Custom Meats, Inc. Review of the data submitted for these industries since August 2017 shows that both industries have frequent violations of the established treatment agreement limits. See the enclosed Effluent Limits Violations reports for details. The discharge of wastewater into a publicly owned treatment works in volumes or quantities in excess of those to which a major contributing industry is committed in a treatment agreement is a violation of Subrule 567 IAC 62.1(6). The discharge limits established in the treatment agreement have also been incorporated into the NPDES permit issued to the City. Failure to enforce treatment agreement limits constitutes a violation of Subrule 567 IAC 64.3(1). The City must either enforce the limits in the treatment agreements, or negotiate new treatment agreements with limits the industries can meet.

Mr. Danielson indicated that the City signed a new treatment agreement with Mary Ann's Specialty Foods this spring. If you have not already done so, the City must submit this new agreement to Ben Hucka, IDNR Pretreatment Coordinator in Des Moines, and to IDNR Field Office 2 in Mason City. Once the agreement has been approved, the new limits will be incorporated into the City's NPDES permit. Mr. Danielson also stated that the City issues monetary penalties for exceedances of the treatment agreement limits; however, additional action may be needed to ensure industrial compliance is maintained.

It is recommended that periodic industrial surveys be completed to ensure that all SIUs are identified and properly regulated. See page 31 of the NPDES permit for more information on SIUs.

5a. PRIMARY TREATMENT and 7a. FINAL SETTLING – Operation and Maintenance

Even flow of wastewater was noted over the weirs in each of the primary and final clarifiers. Heat lamps are present on the scum boxes in all clarifiers to help prevent freezing in the winter. The skimmer arms appeared to adequately remove scum. Mr. Danielson reported that the clarifiers are cleaned monthly in the winter and every 1-2 weeks in the summer to remove any solids or filamentous growth.

6a. SECONDARY TREATMENT – Operation and Maintenance

The trickling filter distributor arms are hydraulically driven to distribute wastewater over the rock media. Mr. Danielson reported that the recirculation pump was recently repaired. No mud balls were observed and no pooling or ponding of water was evident in the trickling filter during this inspection. Mr. Danielson stated that the openings in the distributor arms are cleaned about once every two weeks in the summer and about monthly in the winter to prevent plugging.

8a. SUPPLEMENTARY TREATMENT – Operation and Maintenance

Only one half of the chlorine contact chamber is in use. The chlorine and sodium bisulfite are fed automatically. Mr. Danielson reported that a new chlorinator and injector were installed the month prior to this inspection.

9a. SLUDGE HANDLING AND DISPOSAL

Sludge is automatically pulled from the primary clarifiers. Mr. John West reported that they pump about 1400-1800 gallons per day from each of the clarifiers and maintain sludge blankets of about 18-24". Sludge from the final clarifiers is automatically pulled and flows by gravity back to the headworks of the plant. The sludge blanket in the final clarifiers is approximately 3-6" deep. They pull supernatant from the digesters every Friday and return a total of about 100,000 gallons per month to the head of the plant.

Mr. Danielson reported that the south sludge drying bed was removed and filled in. The remaining drying bed is used primarily for grit. The City also utilizes the services of HydroKleen to clean out sections of the sanitary sewer. Any waste from this process is also placed in the drying bed.

All municipalities disposing of sewage sludge by land application must comply with the requirements of Chapter 67 of the Iowa Administrative Code (IAC) and the National Sewage Sludge Program contained in Title 40 Code of Federal Regulations Part 503. The City's biosolids management plan and application records were reviewed during this inspection. Overall, it appears that proper sludge records are being maintained; however, records indicate that this facility land applied about 50 dry tons of sludge in 2018, but the biosolids plan, which was developed in 2016, indicates production levels of about 220 dry tons. **As a reminder, Rule 567 IAC 67.4(455B) requires that the City's biosolids management plan be reviewed and updated annually.**

11a. FLOW MEASUREMENT

The influent and effluent flows at this facility are measured by Parshall Flumes with ultrasonic flow meters. The meters should be calibrated in accordance with the manufacturer's recommendations. Mr. Danielson stated that an outside company calibrates the meters each year. Documentation of such calibration activities must be kept in the facility records for a minimum of three years.

. MISCELLANEOUS – Emergency Operation

ere is no emergency generator at the treatment plant, but Mr. Danielson stated that they have a redundant power supply.

Facility Name: Webster City Wastewater Treatment Facility **Page 6**

NPDES Permit #: 4063001 **Inspection Date:** 07/16/19

SUMMARY

Overall, the facility appears to be properly operated and maintained, but it is nearing its design capacity. The City is in the process of planning facility upgrades to an activated sludge plant to meet more stringent effluent metals limits and the nutrient reduction construction schedule. The City is in significant non-compliance for failure to submit annual progress reports for the metals compliance schedule. Infrequent effluent violations and numerous treatment agreement violations from both industrial users were noted since the last inspection.

REQUIREMENTS

1. Comply with all permit effluent limits per Subrule 567 IAC 64.3(1) and provide proper notification of any non-compliance issues per Subrules 567 IAC 63.12(455B) and 63.15(455B).
2. Submit the delinquent progress reports regarding the metals compliance schedule and comply with all other deadlines in the schedule per the permit and Subrule 567 IAC 64.3(1).
3. Submit information detailing how the City will comply with the emergency operation requirements for all lift stations pursuant to Section 13.11 of the Iowa Wastewater Facilities Design Standards.
4. Review and update the biosolids management plan annually in accordance with Rule 567 IAC 67.4(455B).

RECOMMENDATIONS

1. Budget funds annually for I/I work as the collection system will deteriorate with age.
2. Work to eliminate all wastewater bypasses.
3. Work with existing industrial users to ensure compliance with all treatment agreement limits. Conduct periodic industrial surveys to ensure that all SIUs are identified and properly regulated.

13.11 EMERGENCY OPERATION

Pumping stations and collection systems shall be designed to prevent or minimize bypassing of wastewater. For use during possible periods of extensive power outages, mandatory power reductions, or uncontrolled storm events, an emergency means of operation shall be provided, such as a second, independent power source connected to the station, an engine-driven generator, engine-driven standby pumps or portable pumps or portable generator. The standby facilities must be capable of being placed in operation at the site within 30 minutes of the onset of the emergency condition (preferably before the liquid level in the wet well rises to the overflow level).

Engine-driven pumps must meet all applicable requirements in Section 13.4 of these standards. Provisions for backup power sources must comply with the requirements of Section 14.5.3 of these standards.

In addition to the required emergency means of operation, where overflows affect public water supplies, a high level wet well overflow and a storage/detention basin, or tank, shall be provided having 2-hour detention capacity at the anticipated overflow rate. Storage/detention tanks, or basins, shall be designed to drain by gravity or pumping to the station wet well.

Consideration should be given to providing a high level wet well overflow to suppplement alarm systems and required standby facilities in order to prevent backup of wastewater into basements, or other discharges which may cause severe adverse impacts on public interests, including public health and property damage.

Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		DAILY MAXIMUM - MG/L		AVERAGE - GEOMEAN	
		Limit	DMR	Limit	DMR
Outfall: 001					
10/2017	E. COLI			630	1343.89
8/2018	E. COLI			630	4829.23
10/2018	E. COLI			630	11,093.33
	TRC	0.336	0.34		
11/2018	TRC	0.336	0.34		

Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		DAILY MAXIMUM - MG/L		AVERAGE - GEOMEAN	
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Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY
EPA #:IA0036625

MARY ANN'S SPECIALTY FOODS
Outfall: 001

		AVERAGE - LBS/DAY		DAILY MAXIMUM - LBS/DAY		AVERAGE - MGD		DAILY MAXIMUM - MGD		DAILY MAXIMUM - STD UNITS		DAILY MINIMUM - STD UNITS	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
8/2017	BOD5			400	457.2977457								
	PH									11	11.56		
9/2017	BOD5	300	362.5544575	400	629.0850991								
	FLOW							0.04	0.043602				
10/2017	BOD5	300	879.9033057	400	3027.290146								
	FLOW					0.03	0.0382463	0.04	0.34669				
	TKN	30	86.9418082	40	303.596433								
	O&G			125	144.56973								
	PH									11	11.93	6	5.33
	TSS	150	214.503232	250	809.590488								
11/2017	PH											6	5.52
2/2018	PH											6	5.52
5/2018	PH									11	11.78		
7/2018	FLOW							0.04	0.040706				
8/2018	TKN			40	42.5470104								
9/2018	PH											6	5.98
10/2018	BOD5	300	376.026414	400	430.674264								
11/2018	BOD5	300	476.7657744	400	748.86111								
	TKN	30	41.0213908	40	53.144982								
	O&G			125	346.8917916								
	PH											6	5.79
12/2018	BOD5			400	444.0216								
	FLOW					0.03	0.030767	0.04	0.042268				
	TKN			40	41.627025								
1/2019	FLOW							0.04	0.19652				
6/2019	FLOW							0.04	0.054489				

Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		AVERAGE - LBS/DAY		DAILY MAXIMUM - LBS/DAY		AVERAGE - MGD		DAILY MAXIMUM - MGD		DAILY MAXIMUM - STD UNITS		DAILY MINIMUM - STD UNITS	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
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Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		AVERAGE - LBS/DAY		DAILY MAXIMUM - LBS/DAY		AVERAGE - MGD		DAILY MAXIMUM - MGD		DAILY MAXIMUM - STD UNITS		DAILY MINIMUM - STD UNITS	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
WEBSTER CITY CUSTOM MEATS													
Outfall: 001													
9/2017	O&G			125	317.9013427								
11/2017	FLOW					0.08	0.0800903	0.11	0.12312				
	TSS			300	349.5318936								
12/2017	BOD5	600	853.4107703	900	1397.184254								
	FLOW							0.11	0.124317				
	TKN			80	91.4823023								
	PH											6	5.1
6/2018	PH									11	12.99		
7/2018	BOD5			900	1085.48019								
8/2018	BOD5	600	645.512764	900	1967.492736								
	FLOW							0.11	0.42224				
	PH											6	4.63
10/2018	FLOW							0.11	0.128551				
11/2018	FLOW							0.11	0.121475				
	PH									11	12.63		
12/2018	FLOW							0.11	0.12989				
1/2019	PH									11	11.29		
3/2019	[illegible]									11	12.1		
4/2019	BOD5			900	1004.489616								
	PH											6	4.72

Effluent Limit Violations 8/1/2017 - 6/30/2019

WEBSTER CITY, CITY OF STP - 4063001

WEBSTER CITY EPA #:IA0036625		AVERAGE - LBS/DAY		DAILY MAXIMUM - LBS/DAY		AVERAGE - MGD		DAILY MAXIMUM - MGD		DAILY MAXIMUM - STD UNITS		DAILY MINIMUM - STD UNITS	
		Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR	Limit	DMR
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	PH											6	5.1
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	PH											6	4.72

April 12, 2021

City of Webster City
City Hall, P.O. Box 217
Webster City, IA 50595

Subject: Wastewater Treatment Facility Inspection, Permit No. 4063001
Letter of Noncompliance – Compliance Schedule Reporting

ATTENTION: Honorable Mayor and Council Members

Jeremy Klatt, Environmental Specialist with this office, conducted an inspection of your facility on March 10, 2021. A field inspection report was completed and is enclosed for your file. I concur with the content of the report.

At the end of this report, Mr. Klatt has summarized his recommendations for facility operation improvements and stated required actions that must be completed in order to comply with the Iowa Administrative Code.

If you have any questions concerning the report, please contact Mr. Klatt at 641-424-4073.

Sincerely,

FIELD SERVICES & COMPLIANCE BUREAU

Trent Lambert
Field Office Supervisor

TL/jk

c: DNR Records Center

Iowa Department of Natural Resources
Wastewater Treatment Facility Inspection Form

NPDES Permit #: 4063001

FACILITY INFORMATION

Facility:
Name: **Webster City Wastewater Treatment Facility** Plant Grade: **WW-III**
Responsible Authority/Owner: **City of Webster City**
Address: **City Hall, P.O. Box 217** Phone: **515-832-9185**
City: **Webster City** State: **IA** Zip: **50595**

Responsible Operator:
Name: **Tim Danielson** Grade: **WW-III** Certification Number: **9349**

General Description:
This facility consists of a collection system with 3 lift stations and a treatment plant comprised of the following units or processes: a comminutor, a bypass channel with a bar screen, an aerated grit chamber, cyclone grit removal and grit washer, 3 primary clarifiers, 1 uncovered trickling filter, 20 rotating biological contactors (RBCs) arranged in 5 trains of 4 with aeration, 2 final clarifiers, a chlorine contact chamber with gas chlorination, and sodium bisulfite feed for dechlorination. Sludge is stabilized in a primary anaerobic digester with a fixed cover and a secondary digester with a floating cover. Sludge may be dried in the sludge drying bed or stored in a 1.2 million gallon storage tank prior to disposal by land application.

Design Capacity:
Average MGD: **3.300** Maximum MGD: **6.00**
Pounds BOD/Day: **4150** PE (BOD): **24,850**

Now Treating:
Average MGD: **1.45** Maximum MGD: **7.27**
Pounds BOD/Day: **3629** PE (BOD): **21,730**
Period Reviewed: **Jul. 2019 – Dec. 2020** Population Served: **8070 (2010 Census)**

Receiving Stream:
Outfall 001 - Unnamed tributary to Oxbow Lake, Tributary to the Boone River
Outfall 003 – Boone River

INSPECTION INFORMATION

Inspection:
Date and Time of Inspection: **03/10/21** Purpose: **Compliance Evaluation**
Date of Last Inspection: **07/16/19**

Persons Interviewed:
Name: **Tim Danielson** Title: **Wastewater Superintendent**

NPDES PERMIT COMPLIANCE SUMMARY

Self-Monitoring:
Operation Reports Submitted: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Required Data on Reports: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Testing Adequacy: ☒ Sat. ☐ Marg.* ☐ Unsat.*

Effluent Limitations:
Self-Monitoring Results: ☒ Compliance ☐ Infrequent Non-Compliance* ☐ Significant Non Compliance*

Samples this Inspection:
Type: **Influent & Effluent** Lab Data Attached? ☒ Yes ☐ No Results: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Visual Appearance of Effluent: **Clear**
Visual Appearance of Receiving Stream: **Clear**

Compliance Schedule:
Compliance w/Schedule: ☐ Sat. ☐ Marg.* ☒ Unsat.* ☐ NA Next Items Due: **Delinquent progress report.**
* Additional details in the narrative report **Compliance schedule completed.**

AUTHENTICATION

Inspector: Jeremy Klatt [signature] Date: 4/12/21
Reviewer: David Miller [signature] Date: 14 APRIL 21

NPDES Permit #: 4063001

FACILITY EVALUATION

Were deficiencies noted or significant observations made during the inspection?

Yes = See Comments Section for details
No = No deficiencies or significant observations were noted
Lack of Entry = Item not applicable or not observed.

Item	Yes	No
1. Collection System		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Dry Weather Capacity	☐	☒
d. Infiltration/Inflow	☒	☐
e. Bypass(es)	☒	☐
2. Lift Station(s) (Collection System)		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/Emergency Operation	☐	☒
3. Industrial Waste Pre-Treatment		
a. Significant Industrial Users	☒	☐
b. Waste Toxicity/ Compatibility	☐	☒
c. Strength Reduction	☐	☒
d. Effect on Treatment Plant	☐	☒
4. Preliminary Treatment		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
5. Primary Treatment		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Sludge/Scum Removal	☐	☒
e. Effectiveness	☐	☒
6. Secondary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Recirculation	☐	☒
e. Freezing	☐	☒
f. Effectiveness	☐	☒
7. Final Settling		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
8. Supplementary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒

Item	Yes	No
9. Sludge Handling and Disposal		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
e. Final Disposal, Solids	☐	☒
f. Final Disposal, Liquids	☒	☐
10. Lagoon Structures		
a. Maintenance	☐	☐
b. Physical Condition	☐	☐
c. Capacity	☐	☐
d. Cell Configuration	☐	☐
e. Storage/Drawdown Management	☐	☐
11. Flow Measurement		
a. Operation and Maintenance	☒	☐
b. Capacity	☐	☒
c. Continuity	☐	☒
d. Location. Method/ Effectiveness	☐	☒
12. Pumping		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/ Emergency Operation	☐	☒
13. Miscellaneous		
a. Location	☐	☒
b. Odors	☐	☒
c. Emergency Operation	☐	☒
d. Bypass(es)	☐	☒
e. Equipment	☐	☒
f. Buildings & Grounds	☐	☒
g. Lab Certification	☒	☐
h. Other	☐	☐
14. Staffing, Operator Certification		
a. Operator, Direct Responsibility	☐	☒
b. Shift Operator(s)	☐	☒
c. General Staffing	☐	☒
15. Supplementary		
a. Permit Availability	☐	☒
b. Operation Reports Availability	☐	☒
c. Equipment Records Maintenance	☐	☒
d. Previously Noted Deficiencies	☐	☒
e. Improvements	☐	☒
f. Domestic/Industrial Growth	☐	☒
g. Recommendations	☒	☐
h. Required Actions	☒	☐

Facility Name: Webster City Wastewater Treatment Facility

NPDES Permit #: 4063001 **Inspection Date:** 07/16/19

INTRODUCTION

A compliance inspection was conducted at the Webster City WWTP on March 10, 2021. The inspection involved a review of City records, discussions with the operator identified above, and a walk through of the treatment plant. The purpose of the inspection was to determine the compliance status of the facility.

NPDES PERMIT COMPLIANCE SUMMARY

Discharge from this facility is authorized by NPDES permit #4063001. The NPDES permit was issued on March 1, 2016, and expired on February 28, 2021. An application for permit renewal was received on August 27, 2020, therefore, the City should continue to operate under the conditions of the expired permit until the new permit is issued.

Self-Monitoring Results

Monitoring reports for the period of July 2019 to December 2020 were reviewed for compliance with the permit. Effluent violations on the report in August 2019 (E. coli), October 2019 (ammonia) and November 2020 (pH and CBOD) were found to be data entry errors. Mr. Danielson resubmitted the reports to correct errors. After correcting for the reporting errors, no effluent violations occurred during the reviewed period.

Standard Conditions #13 & #14

Please note that permit conditions 13 and 14 require that effluent violations be reported either verbally (condition #13) or in writing at the time of MOR submittal (condition #14). The four effluent violations above were not reported at the time of the report submittal as required

Toxicity Testing

Toxicity testing was completed in October of 2019 and October of 2020; the effluent passed the test in both years. Please note that your permit requires submittal of the toxicity test results (DNR Form 542-1381) with the monthly operation report.

Compliance Sample

Influent and effluent samples were taken by Travis Morarend with the State Hygienic Laboratory during the inspection and the results are summarized below:

Table 1. Sampling Results from Inspection

	Influent		Effluent	
	mg/L	lbs/day	mg/L	lbs/day
BOD	310	3152	-	-
CBOD	-	-	17	192
TSS	140	1423	15	170
TKN	34	346	11	124
Ammonia	-	-	6.8	77
Nitrate	0.57	5.8	7.5	85
Total Nitrogen	34.6	351	18.9	213
Zinc	-	-	0.03	0.34
Cadmium	-	-	<0.00025	<0.0028
Silver	-	-	<0.001	<0.011
Copper	-	-	0.009	0.0102
Total P	9.9	101	9.4	106
DO	-	-	7.3	-

- Not sampled

Compliance Schedule

The NPDES permit for Webster City contains a compliance schedule to meet more stringent effluent limits for cadmium, copper, silver, zinc and total residual chlorine. This schedule called for submittal of a progress report on June 1, 2020, and compliance with final limits on February 1, 2021. This progress report had not been received at the time of the inspection, but was received following the inspection on March 16, 2021. The progress report indicates that City is currently meeting the more stringent metals limits. Review of the compliance data submitted for the reviewed period confirmed that the City is meeting the new, more stringent metal limits.

The report also indicated that the City does not have the capability to measure TRC concentrations low enough to demonstrate compliance with the new TRC limit. During the inspection Mr. Danielson confirmed that the City has not yet purchased the new equipment. The City was not disinfecting on the day of the inspection but would need to begin disinfection on March 15. Without the ability to demonstrate compliance with the new limit, the City will be in violation of the permit limit.

Nutrient Reduction Strategy Construction Schedule

The construction schedule for nutrient reduction requires annual progress reports on March 1 of each year. The 2021 report had not been received at the time of the inspection, but was received following the inspection on March 16, 2021. The report indicates the City is in the planning process for construction of a new facility that will be designed with biological nutrient removal with supplemental chemical phosphorus removal. During the inspection, Mr. Danielson indicated that construction of the new plant will likely begin in two years.

FACILITY EVALUATION

Items 1d & e. COLLECTION SYSTEM – Infiltration/Inflow & Bypassing

No bypassing was reported during the reviewed period. However, the City should continue to budget funds for infiltration and inflow (I/I) as the collection system will continue to deteriorate over time.

Item 2a. LIFT STATION

There are three lift stations in town to pump all wastewater to the treatment plant. Mr. Danielson reported that the two primary lift stations (East & North) had their pumps rebuilt during the reviewed period. Furthermore, Mr. Danielson reported that the East lift station may be replaced as part of the facility upgrade project.

3a. SIGNIFICANT INDUSTRIAL USERS (SIUs)

The City's permit currently includes three significant industrial users; Mary Ann's Specialty Foods, Webster City Custom Meats, and Mertz Engineering. Mary Ann's Specialty Foods was inspected in November of 2020 and received a Letter of Noncompliance due to violations of their treatment agreement following the inspection. Webster City Custom Foods was last inspected in February of 2020 and received a Notice of Violation for treatment agreement violations. Review of the Webster City Custom Foods monitoring since February 2020 show that the facility has substantially complied with it's pretreatment limits since that time, though BOD violations occurred in October and December of 2020.

Mertz Engineering, was added to the City's permit as a significant industrial user in July of 2020. Mr. Danielson reported that Mertz Engineering has been submitting monitoring data and a review of their data shows no pretreatment violations, though there have been instances of non-reporting.

Mr. Danielson reported that the City recently signed a treatment agreement with an industry that plans to raise shrimp and will discharge to the City sewer. This treatment agreement should be sent to the DNR Des Moines office for review and inclusion in the new permit.

Item 3a. SIGNIFICANT INDUSTRIAL USERS (SIUs)

the Webster City Custom Foods monitoring since February 2020 shows that the facility has substantially complied with its pretreatment limits since that time, though BOD violations occurred in October and December of 2020.

Mertz Engineering, was added to the City's permit as a significant industrial user in July of 2020. Mr. Danielson reported that Mertz Engineering has been submitting monitoring data and a review of their data shows no pretreatment violations, though there have been instances of non-reporting for some parameters.

Mr. Danielson reported that the City recently signed a treatment agreement with an industry that plans to raise shrimp and will discharge to the City sewer. This treatment agreement should be sent to the DNR Des Moines office for review and inclusion in the new permit.

Mr. Danielson reported that the City is also working to allow an egg breaking facility to discharge to the City. Discussions have been begun with DNR to see if the City has the available capacity needed to allow the discharge.

6a. SECONDARY TREATMENT – Operation and Maintenance

Mr. Danielson reported that the trickling filter had recently become frozen during cold weather in February. The arm was operational at the time of inspection but sustained damage to the center well which was allowing some water to discharge to the filter prior to entering the arm. Mr. Danielson said plans are being made to repair the damage.

8a. SUPPLEMENTARY TREATMENT – Operation and Maintenance

Disinfection was not occurring at the time of inspection; Mr. Danielson indicated that the City planned to begin on March 15, as required by the permit.

9f. SLUDGE HANDLING AND DISPOSAL

Sludge was land applied in December of 2019 and November of 2020. The required pollutant testing was completed in both years and results in both years were below both the pollutant concentrations and ceiling concentrations in Tables 1 and 3 of Iowa Administrative Code. According to the sludge records, vector reduction requirement is met by incorporation and the pathogen reduction requirements was met by fecal coliform testing in 2020 and by detention time in the anaerobic digester in 2019. It is not clear if the City's sludge handling procedures meet the anaerobic digestion standard as it is not the mean cell residence time of the digester is not known. Mr. Danielson reported that pathogen reduction will be met with fecal coliform testing going forward.

11a. FLOW MEASUREMENT

The influent and effluent flows at this facility are measured by Parshall Flumes with ultrasonic flow meters. The meters should be calibrated in accordance with the manufacturer's recommendations. Mr. Danielson stated that an outside company calibrates the meters each year. Documentation of such calibration activities must be kept in the facility records for a minimum of three years.

13g. LAB CERTIFICATION

Operational monitoring and compliance sample analysis for BOD_5, $CBOD_5$, TSS, SS, NH_3-N, TRC, pH, DO, and temperature is conducted at the certified in-house laboratory (Iowa Lab #314). Samples for NO_3-N, TKN, Total N, Total P, metals, toxicity, and *E. coli* are taken to the State Hygienic Laboratory in Ankeny (Iowa Lab #397) for analysis. Samples are hand-delivered to comply with the 6-hour maximum hold time for *E. coli*.

Facility Name: Webster City Wastewater Treatment Facility

NPDES Permit #: 4063001 **Inspection Date:** 07/16/19

SUMMARY

Overall, the facility appears to be properly operated and maintained and no effluent violations were reported during the reviewed period. The City is in the process of planning facility upgrades.

REQUIREMENTS

1. Provide proper notification of any non-compliance issues per Rules 567 IAC 63.12(455B) and 63.15(455B).

2. Ensure that all future compliance schedule items are submitted in accordance with the specified schedules per Subrule 567 IAC 64.3(1).

3. Submit toxicity testing results with the monthly operation reports per Subrule 567 IAC 64.3(1).

RECOMMENDATIONS

- Budget funds annually for I/I work as the collection system will deteriorate with age.

THE UNIVERSITY OF IOWA | STATE HYGIENIC LABORATORY

ANALYTICAL REPORT

1-800-421-IOWA (4692)

Collection Location	Collector and Phone	Client Reference	Accession #
wwtp influent grab sample	morarend uhl0023 515/72-516.38	webster city csi	1620276
WEBSTER CITY, IA	Collected 2021-03-10 10:35	Received 2021-03-10 14:21	Project 03wqcsi

Report To

JEREMY KLATT
IDNR-FO 2

2300 15TH ST SW
MASON CITY, IA 50401-5630

Sample Description	wastewater
Sample Type	Non-Drinking Water
Sample Source	
Sample Note(s)	1

RESULTS OF ANALYSIS - FINAL REPORT

TEST	RESULT (No Units)	ANALYSIS NOTE(S)
Field pH, SM 4500 H+ B		
pH	**7.7**	

TEST	RESULT (degrees C)	ANALYSIS NOTE(S)
Field Temperature, SM 2550 B		
Field Temperature	**12.0**	

SAMPLE AND ANALYSIS NOTES

1. Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

ANALYSIS INFORMATION

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
1. Field pH, SM 4500 H+ B	2021-03-10 10:35 EJO	3201	2021-03-12 07:25 TM	
2. Field Temperature, SM 2550 B	2021-03-10 10:35 EJO	3201	2021-03-12 07:25 TM	

DESCRIPTION OF UNITS

No Units = No Units
degrees C = Degrees Celsius

SITE(S) PERFORMING TESTING

3201 STATE HYGIENIC LABORATORY ANKENY, IOWA LABORATORIES COMPLEX, 2220 S ANKENY BLVD, ANKENY, IA 50023; Phone 515/725-1600; Fax 515/725-1642; Michael D. Schueller, M.S., Associate Director; Wade K. Aldous, Ph.D. (D)ABMM, Associate Director; IOWA ENVIRONMENTAL LAB ID #397

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THE UNIVERSITY OF IOWA | STATE HYGIENIC LABORATORY

ANALYTICAL REPORT

1-800-421-IOWA (4692)

Collection Location	Collector and Phone	Client Reference	Accession #
wwtp effluent grab sample	morarend uhl0023 515/72-516.38	webster city csi	1620277
WEBSTER CITY, IA	Collected 2021-03-10 11:20	Received 2021-03-10 14:21	Project 03wqcsi

Report To

JEREMY KLATT
IDNR-FO 2

2300 15TH ST SW
MASON CITY, IA 50401-5630

Sample Description	wastewater
Sample Type	Non-Drinking Water
Sample Source	
Sample Note(s)	1

RESULTS OF ANALYSIS - FINAL REPORT

TEST	RESULT (mg/L)	QUANT LIMIT	ANALYSIS NOTE(S)
Field Dissolved Oxygen, ASTM D 888-09 C			
Dissolved Oxygen	**7.3**	**0.1**	

TEST	RESULT (No Units)	ANALYSIS NOTE(S)
Field pH, SM 4500 H+ B		
pH	**7.6**	

TEST	RESULT (degrees C)	ANALYSIS NOTE(S)
Field Temperature, SM 2550 B		
Field Temperature	**12.8**	

SAMPLE AND ANALYSIS NOTES

1. Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

ANALYSIS INFORMATION

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
1. Field Dissolved Oxygen, ASTM D 888-09 C	2021-03-10 11:20 EJO	3201	2021-03-12 07:26 TM	
2. Field pH, SM 4500 H+ B	2021-03-10 11:20 EJO	3201	2021-03-12 07:26 TM	
3. Field Temperature, SM 2550 B	2021-03-10 11:20 EJO	3201	2021-03-12 07:26 TM	

DESCRIPTION OF UNITS

mg/L = Milligrams per Liter
No Units = No Units
degrees C = Degrees Celsius

SITE(S) PERFORMING TESTING

3201 STATE HYGIENIC LABORATORY ANKENY, IOWA LABORATORIES COMPLEX, 2220 S ANKENY BLVD, ANKENY, IA 50023; Phone 515/725-1600; Fax 515/725-1642; Michael D. Schueller, M.S., Associate Director; Wade K. Aldous, Ph.D. (D)ABMM, Associate Director; IOWA ENVIRONMENTAL LAB ID #397

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THE UNIVERSITY OF IOWA | STATE HYGIENIC LABORATORY

ANALYTICAL REPORT

1-800-421-IOWA (4692)

Collection Location	Collector and Phone	Client Reference	Accession #
wwtp influent 24 hour composite	morarend uhl0023 515/72-516.38	webster city csi	1622155
WEBSTER CITY,	Collected 2021-03-11 10:40	Received 2021-03-11 13:39	Project 03wqcsi

Report To

JEREMY KLATT
IDNR-FO 2

2300 15TH ST SW
MASON CITY, IA 50401-5630

Sample Description	wastewater
Sample Type	Non-Drinking Water
Sample Source	
Sample Note(s)	1

RESULTS OF ANALYSIS - FINAL REPORT

TEST	RESULT ([MGD])	QUANT LIMIT	ANALYSIS NOTE(S)
Field Flow Rate, ISCO 1989			
Flow Rate	1.219	0.001	

TEST	RESULT (mg/L)	QUANT LIMIT	MCL	ANALYSIS NOTE(S)
Nitrate as N, EPA 300.0				2
Nitrate nitrogen as N	0.57	0.1	10	
Nitrite as N, EPA 300.0				2
Nitrite nitrogen as N	<0.125	0.125	1.0	

TEST	RESULT (mg/L)	QUANT LIMIT	ANALYSIS NOTE(S)
Total Phosphorus as P, LAC 10-115-01-2B			
Total Phosphorus as P	9.9	0.1	
Total Kjeldahl Nitrogen as N, LAC 10-107-06-2M			
Total Kjeldahl Nitrogen as N	34	0.1	
BOD, 5 Day, SM 5210 B			
BOD, 5 Day	310	2	
Total Suspended Solids, USGS I-3765-85			
Total Suspended Solids	140	1	

SAMPLE AND ANALYSIS NOTES

1. Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

   Webster City WWTP Raw Influent 24 hour Time Composite. ISCO sampler was set to collect 150 mL every 20 minutes. ISCO sampler was iced and locked overnight. All samples collected equal in volume, and similar in appearance. All samples were composited.

2. The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

ANALYSIS INFORMATION

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
1. Field Flow Rate, ISCO 1989	2021-03-11 10:40 EJO	3201	2021-03-12 07:32 TM	
2. Nitrate as N, EPA 300.0	2021-03-11 18:24 MGB	3201	2021-03-12 15:12 DLS	
3. Nitrite as N, EPA 300.0	2021-03-11 18:24 MGB	3201	2021-03-12 15:12 DLS	
4. Total Phosphorus as P, LAC 10-115-01-2B	2021-03-23 10:39 SLS	3201	2021-03-24 11:28 MLS	

Collection Location	Collector	Client Reference	Accession #
wwtp influent 24 hour composite	morarend uhl0023	webster city csi	1622155

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
5. Total Kjeldahl Nitrogen as N, LAC 10-107-06-2M	2021-03-23 10:39 SLS	3201	2021-03-24 11:28 MLS	
6. BOD, 5 Day, SM 5210 B	2021-03-11 14:00 AMG	3201	2021-03-17 13:51 JAE	
7. Total Suspended Solids, USGS I-3765-85	2021-03-11 09:05 KAR	3201	2021-03-12 14:57 MLS	

DESCRIPTION OF UNITS

[MGD] = Million Gallons per Day
mg/L = Milligrams per Liter

SITE(S) PERFORMING TESTING

3201 STATE HYGIENIC LABORATORY ANKENY, IOWA LABORATORIES COMPLEX, 2220 S ANKENY BLVD, ANKENY, IA 50023; Phone 515/725-1600; Fax 515/725-1642; Michael D. Schueller, M.S., Associate Director; Wade K. Aldous, Ph.D. (D)ABMM, Associate Director; IOWA ENVIRONMENTAL LAB ID #397

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THE UNIVERSITY OF IOWA | STATE HYGIENIC LABORATORY

ANALYTICAL REPORT

1-800-421-IOWA (4692)

Collection Location	Collector and Phone	Client Reference	Accession #
wwtp effluent 24 hour composite	morarend uhl0023 515-725-1638	webster city csi	1622156
WEBSTER CITY,	Collected: 2021-03-11 11:12	Received: 2021-03-11 13:39	Project: 03wqcsi

Report To

JEREMY KLATT
IDNR-FO 2

2300 15TH ST SW
MASON CITY, IA 50401-5630

Sample Description	wastewater
Sample Type	Non-Drinking Water
Sample Source	
Sample Note(s)	1

RESULTS OF ANALYSIS - FINAL REPORT

TEST	RESULT ([MGD])	QUANT LIMIT	ANALYSIS NOTE(S)
Field Flow Rate, ISCO 1989			
Flow Rate	1.355	0.001	

TEST	RESULT (mg/L)	QUANT LIMIT	ANALYSIS NOTE(S)
Ammonia as N, LAC 10-107-06-1J			
Ammonia nitrogen as N	6.8	0.05	

TEST	RESULT (mg/L)	QUANT LIMIT	MCL	ANALYSIS NOTE(S)
Nitrate as N, EPA 300.0				2
Nitrate nitrogen as N	7.5	0.1	10	
Nitrite as N, EPA 300.0				2
Nitrite nitrogen as N	0.38	0.025	1.0	

TEST	RESULT (mg/L)	QUANT LIMIT	ANALYSIS NOTE(S)
Total Phosphorus as P, LAC 10-115-01-2B			
Total Phosphorus as P	9.4	0.1	
Total Kjeldahl Nitrogen as N, LAC 10-107-06-2M			
Total Kjeldahl Nitrogen as N	11	0.1	
BOD, Carbonaceous 5 Day, SM 5210 B			
CBOD, 5 Day	17	2	
Total Suspended Solids, USGS I-3765-85			
Total Suspended Solids	15	1	
Metals, EPA 200.8			
Cadmium	<0.00025	0.00025	
Copper	0.009	0.005	
Silver	<0.001	0.001	
Zinc	0.03	0.02	

SAMPLE AND ANALYSIS NOTES

1. Upon arrival, sample met container and preservation requirements for the analysis requested. Please review carefully your sample results for additional analyte comments or method exceptions.

   Webster City WWTP Final Effluent 24 hour Time Composite. ISCO sampler was set to collect 150 mL every 20 minutes for 24 hours. ISCO sampler was iced, and locked overnight. All samples were collected equal in volume and similar in appearance. All samples were composited.

Collection Location	Collector	Client Reference	Accession #
wwtp effluent 24 hour composite	morarend uhl0023	webster city csi	1622156

2. The MCL (maximum contaminant level) is only applicable to compliance monitoring samples under the Safe Drinking Water Act (SDWA).

ANALYSIS INFORMATION

TEST	ANALYZED	SITE	RELEASED	ANALYSIS PREP
1. Field Flow Rate, ISCO 1989	2021-03-11 11:12 EJO	3201	2021-03-12 07:35 TM	
2. Ammonia as N, LAC 10-107-06-1J	2021-03-26 12:10 MLS	3201	2021-03-26 14:12 JAE	
3. Nitrate as N, EPA 300.0	2021-03-11 19:56 MGB	3201	2021-03-12 15:12 DLS	
4. Nitrite as N, EPA 300.0	2021-03-11 19:33 MGB	3201	2021-03-12 15:12 DLS	
5. Total Phosphorus as P, LAC 10-115-01-2B	2021-03-23 10:39 SLS	3201	2021-03-24 11:28 MLS	
6. Total Kjeldahl Nitrogen as N, LAC 10-107-06-2M	2021-03-25 09:07 SLS	3201	2021-03-25 15:11 JAE	
7. BOD, Carbonaceous 5 Day, SM 5210 B	2021-03-11 14:00 AMG	3201	2021-03-17 13:51 JAE	
8. Total Suspended Solids, USGS I-3765-85	2021-03-11 09:05 KAR	3201	2021-03-12 14:57 MLS	
9. Metals, EPA 200.8	2021-03-23 13:37 SGB	3201	2021-03-24 14:25 MRC	

DESCRIPTION OF UNITS

[MGD] = Million Gallons per Day
mg/L = Milligrams per Liter

SITE(S) PERFORMING TESTING

3201 STATE HYGIENIC LABORATORY ANKENY, IOWA LABORATORIES COMPLEX, 2220 S ANKENY BLVD, ANKENY, IA 50023; Phone 515/725-1600; Fax 515/725-1642; Michael D. Schueller, M.S., Associate Director; Wade K. Aldous, Ph.D. (D)ABMM, Associate Director; IOWA ENVIRONMENTAL LAB ID #397

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Appendix O: Council Resolution to Approve Facility Plan

RESOLUTION NO. 2022 – xxx

DRAFT

RESOLUTION OF THE CITY COUNCIL OF WEBSTER CITY ACCEPTING AND ADOPTING THE AUGUST 2022 WASTEWATER TREATMENT FACILITY IMPROVEMENTS FACILITY PLAN PREPARED BY BOLTON & MENK, LLC AND AUTHORIZING THE SUBMITTAL OF THE FACILITY PLAN TO THE IOWA DEPARTMENT OF NATURAL RESOURCES

WHEREAS, the City of Webster City owns and operates a publicly owned treatment works (POTW); and

WHEREAS, the City of Webster City is in the planning and design phase of the Wastewater Treatment Facility Improvements project and seeks to proceed into the construction phase of the project; and

WHEREAS, the Iowa Department of Natural Resources (IDNR) requires the City obtain a construction permit to construct the Wastewater Treatment Facility Improvements Project; and

WHEREAS, the City must submit a Facility Plan for the project as part of the IDNR construction permit review process; and

WHEREAS, the City wishes to formally accept and adopt the August 2022 Wastewater Treatment Facility Improvements - Facility Plan prepared by consulting engineer, Bolton & Menk, LLC; and

WHEREAS, the City of Webster City wishes to designate the City Manager as the signing authority for permit applications; and

NOW THEREFORE BE IT RESOLVED, by the City Council of the City of Webster City, Iowa as follows:

SECTION 1: Designates Daniel Ortiz-Hernandez, the City of Webster City's City Manager, as the signing authority for construction permit and related applications to the Iowa Department of Natural Resources.

SECTION 2: Accepts and Adopts the recommendations noted in the August 2022 Wastewater Treatment Facility Improvements Facility Plan prepared by Bolton & Menk, Inc.

SECTION 3: Authorizes the submittal of the August 2022 Wastewater Treatment Facility Improvements Facility Plan prepared by Bolton & Menk, Inc. to the Iowa Department of Natural Resources.

Passed and adopted this 6th of September, 2022.

____

John Hawkins, Mayor

ATTEST:

____

Karyl K. Bonjour, City Clerk

Value Engineering Analysis for the City of Webster City's Wastewater Treatment Facility Expansion

by

Brandon Cheney

A creative component submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Civil Engineering with Environmental Emphasis

Program of Study Committee:

Timothy Ellis, Major Professor

Say Kee Ong

Jon Rouse

Iowa State University

Ames, Iowa

2023

Table of Contents

Introduction and Background

This project began when an industrial user in the City of Webster City, Iowa, reached out to Iowa State University regarding a proposed wastewater treatment facility expansion project. The industrial user was concerned about the impact of the rate increases resulting from this project. Therefore, it was requested that the currently selected design be reviewed to identify any potential cost savings measures. This report aims to do a comprehensive review of the selected design alternative and identify methods for the City of Webster City to reduce the financial impact of this project.

Management of point source pollution is crucial to maintaining environmental quality in rivers and streams. As science and technology continually improve, our society gains the ability to treat water to higher standards. Recently, the Iowa nutrient reduction strategy was enforced by the Iowa Department of Natural Resources (IDNR). The Iowa nutrient reduction strategy focused on the removal of nitrogen and phosphorus from wastewater. The first major step of this program required point source dischargers to submit a facility plan outlining the feasibility of reducing pollutants of concern. The facility plan includes the development of flows, loadings, and design alternatives then concludes by providing price information and selecting the most viable alternative.

Based on the Iowa Nutrient Reduction Strategy, the City of Webster City, Iowa was given new, more stringent nitrogen limits and phosphorus monitoring requirements. Nitrogen limits were applied as limits on ammonia nitrogen and nitrate nitrogen. Webster City is in north central Iowa and has a population of approximately 7,814. As urban populations continue to rise and industrial development occurs, there will be a large impact on many wastewater treatment facility loadings across all cities. The City of Webster City is expected to see this trend occur. This will increase the quantity of wastewater that must be treated by the city. The rise in industrial development has the potential to greatly increase the loading strength as well. Based on these factors, the City of Webster City was given a compliance schedule by the IDNR outlining what needs to be completed to meet these limits.

A facility plan was recently completed for Webster City, Iowa as part of their compliance schedule. This facility plan provides details of how the City of Webster City could meet the new effluent limits. This facility plan was completed for Webster City by a local consulting engineering firm. It was determined that the City's existing facility cannot be upgraded or modified to meet the new limits provided by the IDNR. Therefore, Webster City would need to build a full new facility to achieve its treatment requirements. Complete facility reconstruction would provide many benefits to Webster City but also would be very expensive.

Iowa State University was asked to review the alternatives proposed by the main industrial users in Webster City. These users are concerned that the large increase in rates proposed will have unintended negative impacts on the Webster City community. The goals of this review are to 1) Review the currently proposed alternative and rate increases, 2) Identify potential design modifications that provide cost savings, and 3) Model alternate processes that were not originally included for design consideration. The study objectives are intended to provide value to the City of Webster City and help make this project as economically feasible as possible.

Facility Plan Design Solution

The existing facility includes primary clarifiers, rotating biological contactors, trickling filters, secondary clarifiers, chlorination and dichlorination, anaerobic digesters, and liquid sludge storage. The existing facility site is shown below in Figure 1. Overall, the existing infrastructure is in good condition, but the trickling filter and rotating biological contractor processes struggle to achieve nutrient removal. This is a primary reason that a new process must be constructed for Webster City. The new limits given to the city are far stricter than the previous effluent limitations. In the facility plan, the overall design schematic for the new treatment facility improvements was developed and maintained throughout the facility plan. Each treatment alternative proposed in the facility plan would require a new site for construction.

The facility plan calls for the influent bar screen, aerated grit chamber, and lift station at the existing site to be modified and updated for use in the new design. The existing lift station will be expanded and be used to pump wastewater to the new facility site. This lift station currently

Figure 1 - Existing facility site.

only provides the pumping capacity required to carry wastewater to an elevation where it can flow to the facility by gravity. This requires much smaller pumps and wet well sizes since the head conditions are more favorable than the condition that will be seen from pumping the wastewater to a new site through 1.5 miles of influent force main. This is the primary reason that new pumps and wet well modifications are required to reuse this lift station.

The facility plan calls for a new facility to be constructed that includes bar screening, grit removal, flow equalization, biological treatment process, solids separation, disinfection, and solids handling. These processes are typical of activated sludge wastewater treatment facilities and will provide a good alternative for the City of Webster City. The new facility can be designed and constructed in a modular manner. This allows for the facility to be relatively easily expanded as flows and loadings increase in the future.

Bar screening and grit removal are provided to remove debris and dense solids that would damage downstream equipment. This process is essential to the life span of a treatment facility. Flow equalization is provided to mitigate the impacts of inflow and infiltration (I&I) by ensuring that large peak flows are dissipated and not carried through the whole treatment facility. I&I is common in wastewater collection systems. Large volumes of I&I increase the peak flows seen at the treatment facility due to wet weather, this is evident in the operating data for the city. Carrying peak flows through each of the processes in the treatment facility would require increasing the size of every process included.

Biological treatment is the next step in the flow through this facility after screening and grit removal. Three design alternatives for biological treatment were fully developed in the facility plan for consideration by Webster City. Each design alternative is a version of activated sludge modified for biological nutrient removal. The proposed alternatives are the University of Cape

Town (UCT) Activated Sludge (Figure 2), Modified Ludzack-Ettinger (MLE) Activated Sludge (Figure 3), and Sanitaire Bioloop® processes. The MLE Activated Sludge and Sanitaire Bioloop® processes both are designed to facilitate nitrification and denitrification. Nitrification occurs in aerobic environments. This environment is provided in the aeration basin where ammonia nitrogen is converted to nitrate in addition to CBOD begin removed from wastewater. Denitrification occurs in anoxic environments, which are provided in the dedicated anoxic zone. These anoxic zones are provided before the aerobic zone since the bacteria that facilitate the denitrification reactions require a greater amount of substrate. This requirement is met by introducing the return-activated sludge (RAS) at the influent end of these basins. Many different design components were considered when selecting which alternative is the best fit. The UCT process will have the capability to provide enhanced biological phosphorus removal in addition to nitrification and denitrification. Phosphorus removal is achieved through enhanced biological phosphorus removal (EBPR). EBPR occurs when phosphorus-accumulating organisms (PAO) are cycled between anaerobic and aerobic conditions. The Sanitaire Bioloop® process requires larger oxidations ditches than the other alternatives, increasing its land requirement. Each of

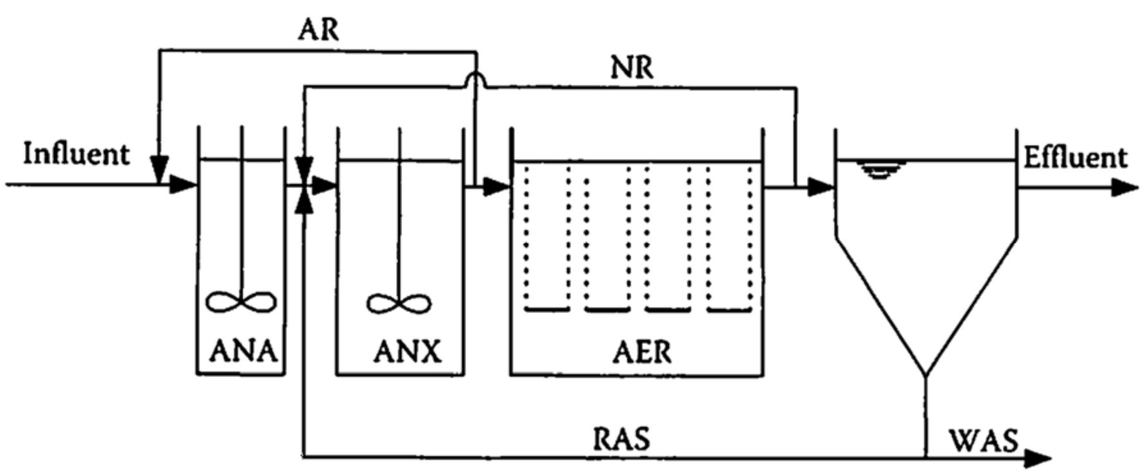

Figure 2 - Schematic of the University of Cape Town (UCT) biological nutrient removal process Figure 1.16, Grady et al., Biological Wastewater Treatment

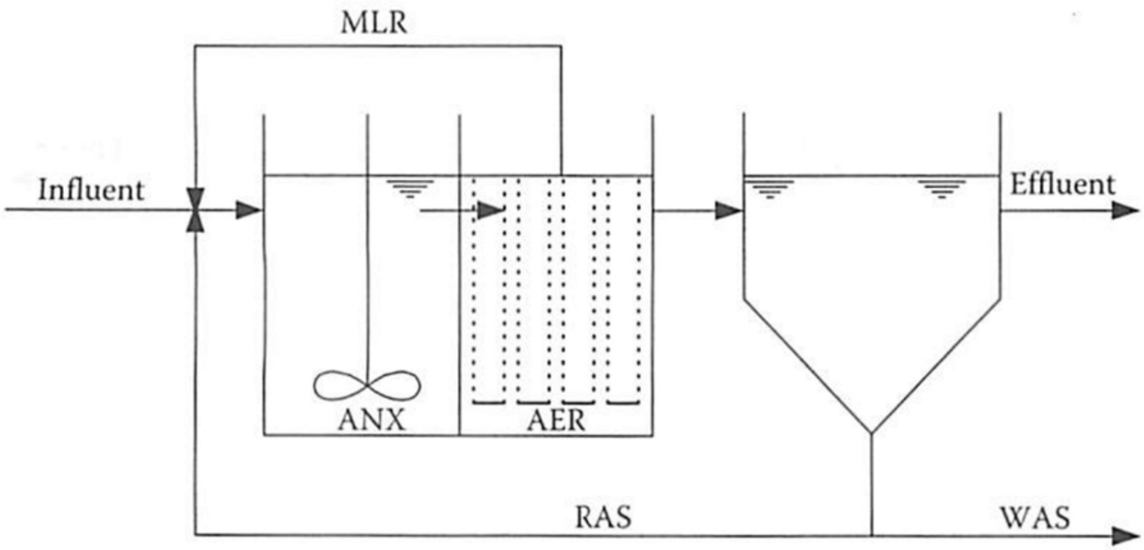

Figure 3 - Schematic of the Modified Ludzack-Ettinger (MLE) biological nutrient removal process; Figure 1.13, Grady et al., Biological Wastewater Treatment

these processes can meet the total nitrogen reduction and carbonaceous biochemical oxygen demand (CBOD) requirements.

Following biological treatment, the facility plan calls for solids separation to be completed by three clarifiers. Each clarifiers design includes a building for chemical feed and storage. The chemicals provided are coagulants to improve settleability as needed and to improve phosphorus removal. Phosphorus removal must be achieved by the addition of chemicals for the MLE Activated Sludge and Sanitaire Bioloop® processes. Chemical phosphorus removal is not required for the UCT Activated Sludge process, but the chemical feed infrastructure will still be provided with the alternative for use during any time when the biological process is not meeting discharge limits. Sludge waste and return systems are also provided as part of the clarifier systems. Return-activated sludge is conveyed back to the biological treatment process. Waste-activated sludge is sent to the biosolids handling infrastructure.

While phosphorus removal is an important design consideration when selecting a biological process, Webster City currently does not have any proposed or existing phosphorus limits. Each design alternative for the treatment facility can remove phosphorus. This capability will be important for future limitations as they are provided and enforced by the IDNR. If a process where considered does not remove phosphorus, the facility could be modified and upgraded in the future to include this capability. An example method that could be used for this would be adding tertiary filters to provide polishing and phosphorus removal as a final step in the treatment process.

The final steps of the treatment process outlined in the facility plan are disinfection and reaeration. Ultraviolet (UV) disinfection is proposed for the new facility. UV disinfection is commonly used in wastewater facilities since it can meet the treatment requirements without leaving a disinfectant residual. The current process used in Webster City is chlorination, which in turn requires dichlorination, making this process more cumbersome and inefficient. Reaeration is provided to ensure that water flowing to the stream meets the dissolved oxygen (DO) requirements. This ensures that there will not be adverse effects seen on wildlife due to oxygen-lacking water being discharged from the facility.

Biosolids that are removed during clarification must be stabilized before final disposal. The biosolids process outlined in the facility plan includes rotary drum thickeners, aerobic digesters, dewatering presses, and cake sludge storage. Waste sludge from the clarifiers is sent to a holding tank for the rotary drum thickeners. The holding tank is provided to ensure stable feed to this equipment. These thickeners will increase the percentage of solids to 4.5%. The thickened sludge will then be sent to the aerobic digesters. The digesters are included to stabilize organics in the sludge by degrading them to more stable forms of nitrogen, phosphorus, and carbon. Dewatering presses will thicken sludge from the aerobic digesters to 20% solids. This thickened sludge will be sent to cake storage until it is used for final disposal. Webster City currently land applies liquid sludge. Cake sludge requires less storage area for a longer period of sludge production due to its decreased water content but requires more labor and is more costly.

The facility plan selected UCT Activated Sludge as the biological treatment process. This process was selected due to its increased EBPR capabilities, which reduces the cost associated with chemicals for the chemical precipitation of phosphorus. This biological process, in conjunction with the other proposed improvements, will allow Webster City to meet all its new and increased treatment limits. Each process proposed for use is typical of a wastewater treatment facility.

Rates for Webster City users are expected to increase largely from the construction of the facility selected in the facility plan. Figure 4 shows a comparison of the current sewer rates for communities that are similar in size to Webster City. Webster City's current rates are shown in green, and Webster City's proposed rates is shown in red. This figure provides a visual comparison of the impact that this project will have on the community's sewer rates relative to others. The facility plan estimates that the sewer bill for 5,000 gallons of use will increase from

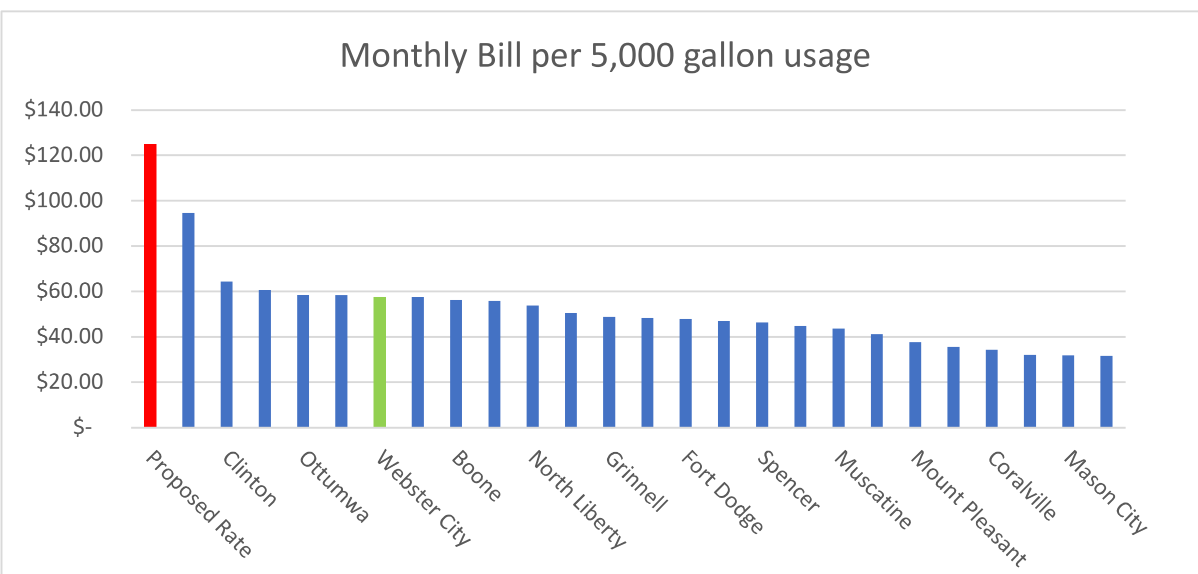

Figure 4 - Sewer rate comparison for similar sized communities.

$58 to $125. This marks a 237% increase in sewer rates for this project. Industrial rates will increase by a similar percentage, 218%. Large rate increases can deter people from moving to Webster City or cause financial hardships for the current residents. These large rates would be much higher than the rates in surrounding cities. Finding methods to reduce the overall cost of the facility is very important to the success of this project.

Value Engineering Measures

While the process as laid out in the facility plan will allow Webster City to meet all its treatment limits, there are areas where value engineering measures can be used to help reduce the overall cost of the new treatment facility. Reusing existing infrastructure, reusing current land, and optimizing excess capacity provided is important to designing the most efficient and economically friendly facility. Six specific value engineering measures were identified and are described in the following paragraphs.

For each value engineering measure outlined, estimated cost savings were also developed. These cost savings were estimated based on the pricing provided in the facility plan. The cost savings were estimated by removing or reducing the quantity of cast in place concrete, precast concrete, and equipment that is associated with the alternatives that are modified. This was the most practical method for estimating the cost savings since it follows the breakdown for each component of the proposed facility that is currently provided in the facility plan. There is also consideration for cost savings associated with simplifying the work that is proposed to be completed. These values are approximate but provide good insight into how savings could be achieved by using the value engineering measures outlined. General conditions, mechanical, electrical, and instrumentation and controls cost were not considered in these cost reductions.

The cost information provided is intended to reflect construction and equipment saving only directly related to the value engineering measure equipment and materials.

Bar Screen and Grit Removal

The first value engineering measure is related to the bar screen and grit removal system proposed. Currently, the City's facility operates an aerated grit removal chamber. The proposed improvements show bar screens at both the existing and new sites. The proposed improvements also call for this grit removal system to be modified and updated, while also adding a new grit removal system at the new facility site. This method provides excess redundancy in the grit removal systems.

To be cost-effective, only one bar screen and a grit removal system could be provided. This system would ideally be provided before the influent lift station to reduce wear on the pumps and prevent clogging. Bar screening could be provided before the influent lift station with either location of the grit removal system. Since the lift station is the only way for flow to be conveyed to the new facility site, it is unlikely that large debris, rags, and other potentially damaging items will be present at the new facility. Updating the grit system at the existing site will make the most use of the infrastructure that is already in place. The water being conveyed will have the grit and large solids removed, reducing the wear on lift station equipment. If it is determined to be necessary to provide a grit removal system at the new site, a bar screen would not be necessary at the new site. This measure will reduce the overall cost by eliminating the non-required redundant treatment components.

There are two possible ways for cost saving with the bar screen and grit removal value engineering measures. The first is to renovate the existing bar screen and grit system, and not construct a new system at the new facility site. This method provides cost savings of $580,000.

The second option is to not renovate the existing system, then build a new bar screen and grit system at the new site. This method provides cost savings of $480,000. Based on these estimated values, it is more practical to only renovate the existing bar screen and grit removal system. Either method does provide effective cost savings. This alternative can lead to some residual grit in the influent to the new facility that enters the system while in the force main. Any grit deposited in the force main during low flow period could be entrained and conveyed to the new system during high flow periods.

Flow Equalization Lagoon

The second value engineering measure identified is related to the flow equalization lagoon. Webster City currently does not have any infrastructure in place for flow equalization. The addition of flow equalization is important because it reduces facility size by limiting the treatment process flow to only the average wet weather flow rather than the peak hour wet weather flow. A 12-million-gallon equalization lagoon is proposed to be constructed. This lagoon has dimensions of 305’ by 540’ and is 20’ deep with 2’ of freeboard. This lagoon is currently proposed to be located at the new facility site.

To save cost and efficiently utilize the land currently owned by Webster City, the flow equalization lagoon could be constructed at the existing facility site after the demolition of the existing facility. The construction of the flow equalization lagoon at the existing site provides many benefits that will save on cost. The land requirement at the new site will be greatly reduced, allowing the city to purchase less land or leave more space available for future improvements. Excavation for the demolition of existing equipment will greatly reduce the amount of earthwork required for lagoon construction. This generates a dual purpose for demolishing the existing facility. Having the flow equalization lagoon at the old site also allows for the new pumps and wet well modifications to only be sized for the average wet weather flow. The pump and wet well size can both be reduced since the flow will be reduced from 11.780 MGD to 5.086 MGD. This will reduce the force main size that is required as well since the flow conveyed will be lower. This will lead to considerable cost savings since the length of the force main is approximately 1.5 miles. This also could reduce the need for a redundant force main since the range over which flows can vary is greatly reduced. Figure 4 below shows a possible flow equalization lagoon layout at the existing facility site. This flow equalization lagoon has the same surface area as the currently proposed flow equalization lagoon at the new facility site and will provide the same amount of storage. This flow equalization lagoon would have to be constructed later in the project though since it will require the new site to be operational before the old site can be taken offline and demolished. With the lift station capacity provided of 5.086

Figure 5 - Potential flow equalization lagoon layout at the existing facility site.

MGD, it would be possible to construct this facility. The 99th percentile flow from 2012 – 2019 is 5.108 MGD, this implies that it is very unlikely to see a peak flow that greatly exceeds the capacity provided.

Construction of the flow equalization lagoon at the existing facility site and reducing the maximum flow that must be pumped is very favorable. The cost savings associated with this value engineering measure is $1,870,000. This cost reduction is achieved by reducing the raw material quantities by half since there will only be one force main required, this includes piping, values, and jacking requirements. With the proper staging of construction, this value engineering measure can be very beneficial to Webster City. This measure will mean that a period will be provided when the new facility is online with no flow equalization. During this period a large storm may cause an overflow in the sewer system. It will be important to pay close attention to potential storms and make sure that infrastructure is operated to handle them efficiently.

Design Loadings

The third value engineering measured identified is related to the loading that was determined for design. The current design loads are based on a 49% increase in population and a 218% increase in the industrial loading capacity. This was mainly contributed by 25% of the total load added as reserve industrial capacity. The population increase was included in the new loads using 0.35 pounds per day (ppd) of CBOD per capita loading. This value was determined in the facility plan from the 2012 – 2019 daily monitoring report data. The industrial loading was removed from this data prior to determination of the per capita loading. This per capita loading is much larger than the standard IDNR design value of 0.17 ppd CBOD per capita. The reasoning for this high load was not determined. The industrial load was added to accomodate future development.

Providing extra capacity to include growth is an important practice when designing wastewater treatment facilities but it is important to avoid overdesign. In this instance, the additional population could be added at the 0.17 ppd CBOD per capita loading that is typically used by the IDNR. This may be closer to what is seen by the facility since new developments will be complete with new infrastructure and likely will resemble the general design value. This would reduce the residential/commercial design loading from 4,063 ppd CBOD to 3,380 ppd CBOD. Providing 25% extra capacity for industrial loads may also be overly conservative. Since the City's rate structure is designed such that industrial users pay as they use capacity, this increase generates a large burden on the current ratepayers. If only 25% of the proposed industrial capacity were added, the total industrial loading would be reduced from 3,383 ppd CBOD to 1,903 ppd CBOD. The average CBOD loading is then reduced from 7,446 ppd CBOD to 5,283 ppd CBOD. This number is still much larger than the 2017-2019 average CBOD loading of 3,586 ppd. The total suspended solids (TSS) and total Kjeldahl nitrogen (TKN) loadings were reduced by only adding 25% of the industrial capacity as extra capacity. The phosphorus (P) load was decreased by 20% which is comparable to the reduction seen from the other methods for reducing loading. The value for all of the reduced loadings are summarized in Table 1.

Table 1 - Reduced Loading versus Facility Plan Loadings

	Current Design	Proposed Reduced Load	Percent Reduction
AWW Flow (MGD)	4.586	4.586	0%
CBOD (ppd)	7,446	5,283	29%
TSS (ppd)	8,104	6,263	23%
TKN (ppd)	845	671	21%
P (ppd)	145	116	20%

This reduction in capacity provides extra capacity without overdesigning. This provides the best value and ensures the smooth operation of the new facility. If the facility is designed for a large load that does not occur, there can be issues with sludge bulking and foaming due to filamentous bacteria's advantages at low substrate concentrations. This also reduced the burden on current ratepayers while allowing for future growth. Additional units of reach processes can be added without complete reconstruction. These processes can be added by only modifying flow-splitting components or including additional flow paths in the original design. The current site proposed is large enough to double the capacity of the plant if needed. Expansion later allows for the burden of increased rate to be shared by a larger number of users once the population increases. Future industrial users will have the option to add a pretreatment process or aid Webster City in expanding their plant to accommodate the capacity required.

Since loading parameters are very crucial to determining the size of process components, the cost saving associated with reducing the design loading to them is directly proportional to the amount they were decreased. The average percentage decrease in the facility loadings is 23.25%. Therefore, by reducing the concrete and equipment cost by 23.25%, the cost savings associated with this value engineering measure is $2,360,000. This shows that there is considerable benefit toward project cost by reducing the design loadings and providing a modular system that can be upgraded in the future.

When reducing the design loading, it is also important to not under design that facility. The proposed design loads are greater than the average historical load that occurs at Webster City's facility. This reduced design loads are intended to accurately portray the future design loadings. Accomplishing this goal allows Webster City to avoid effluent discharge limit violations and provides some room for growth. Reducing these loads does decrease the growth capacity of the current facility and will require additions sooner as the city's population increases.

Increased Pretreatment Requirements

The fourth value engineering measure identified is to enact stricter pretreatment agreements for the significant industrial users, current and future. Webster City currently has agreements with four significant industrial users for CBOD, TSS, and TKN limits. Those industries are Mary Ann's Specialty Foods, Cactus Family Farms, Webster City Custom Meats Inc., and NaturalShrimp, Inc. Mertz Engineering, Inc. metal finishing company that is an additional industrial user. Mertz Engineering, Inc, does not contribute any CBOD, TSS, or TKN loading to the facility and are only monitored for heavy metal concentrations. Overall, these industrial users plan to provide increased loads that have been included in the design consideration.

Industries are very important for the local economy. Determining the best alternative for their treatment is important for their financial stability. These industries and Webster City may mutually benefit from having the industries provide increased pretreatment. This pretreatment could be done using a simple, flow-through anaerobic lagoon system. An approximately 150' by 275' and 10' deep lagoon could provide the 30-day storage of the monthly average flow of 0.08 MGD that is included in the significant industrial user's pretreatment agreement. Adding an anaerobic lagoon system for each significant industrial user would provide multiple benefits in terms of treatment. They would provide peak flows and loading attenuation as well as reducing the CBOD loading. This means that the waste streams leaving these facilities would be more consistent and less concentrated. This provides the industries with more control over their process and decreases the burden on the City's facility. The city has currently noted some pretreatment agreement violations from the current industries, and these lagoons would aid in reducing those violations as well.

To determine the effectiveness of installing anaerobic lagoon systems, modeling software was used. The selected modeling software is BioWin from EnviroSim. BioWin uses the Anaerobic Digestion Model #1 (ADM1) as the basis for the calculations completed based the 19 biochemical processes and 3 gas/liquid mas transfer processes that are included in this model. This provides an accurate and efficient method to determine the treatment benefits that would be provided by the addition of anaerobic lagoons are each of the significant industrial users.

Figure 6 shows the layout that was used. This layout includes influent, an anaerobic lagoon, and effluent. The parameters used for this model were based on the loadings from Mary Ann's specialty foods, which currently has the strongest loading. The lagoon was sized to have a 30-day hydraulic retention time. Based on the model, the industrial user effluent loading for CBOD that is sent to the Webster City wastewater treatment facility was reduced by 474 ppd, TKN was reduced by 11 ppd, and TSS was increased by 55 ppd. At the new sewer surcharge rates that will go into effect on January 1 of 2028, the cost savings associate with the decreased loadings were calculated. There will also be approximately $1,000 in monthly operational costs for the lagoon, this cost is mainly associated with the cost of mixing. These values are summarized and displayed in Table 2. Based on the cost for similar sized lagoon projects in Iowa, this lagoon would cost around $1,500,000. At an interest rate of 6% for a 84-month term, the payment for

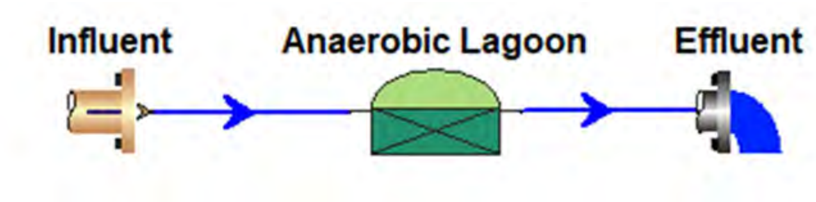

Figure 6 - Anaerobic Lagoon BioWin Configuration

the loan would not exceed monthly savings from the lagoons treatment. Once the loan term is up, the industry will see a continuous benefit from the cost savings associated with this lagoon. This will also free up capacity at the city's facility and reduce the fluctuation of loading that is current seen in the industrial effluent.

There are cost savings associated with increased pretreatment agreements in current and future conditions. The cost savings were calculated by the same method that was used for the design loading cost savings. If the industrial loads can be pretreated to half of their current capacity, and the municipal loading remains the same, the facility capacity would be decreased by

Table 2 - Industrial anaerobic lagoon cost savings

Constituent	Lagoon Influent Load (ppd)	Lagoon Effluent Load (ppd)	Cost Savings
CBOD	600	126	$21,843
TSS	200	255	($1,526)
TKN	50	39	$4,171
Increased Maintenance Requirements			($1,000)
Total Cost Savings			$23,488

approximately 20%. The cost savings would be $2,000,000. While this may not be currently enforced since there are existing agreements with the industrial users, this does provide evidence that there may be a benefit for future industrial users and the city if the industrial user provides pretreatment systems. This option may also reduce the profits seen by the city from the sewer rates but allows for a smaller facility to meet an increased population load and decreases the chance of effluent violations.

There are some disadvantages associated with his value engineering measure. The local industries are required to spend a large sum of upfront money and train personnel to manage this lagoon. The city would also receive reduced income from the sewer surcharge for these industries, which may cause the need for an increase in domestic sewer rates if there is not enough profit to cover the debt service for this project. This pretreatment requirement would need to be determined before the project is constructed to ensure that the facility is sized for the industrial loads that will be seen by Webster City's treatment facility.

Sludge Handling Process

This fifth value engineering measure involves the sludge handling process. Currently, full sludge dewatering and cake storage are proposed for the treatment facility. This process provides the best class of sludge but also requires more infrastructure to achieve this. Webster City currently operates a liquid sludge storage tank and practices land application of liquid sludge for disposal.

While providing dewatering is an ideal process, the city is currently familiar with the liquid sludge storage and land application process. To save on cost, the existing sludge storage tank could be reused and moved to the new site. This tank is constructed of bolted steel. A new foundation and jet mixing system will be required for reuse of this tank, but these options should cost less than adding dewatering presses and cake sludge storage. The sludge will still need to be thickened with the rotary drum thickeners to raise the solids to around 4.5%. The use of thickening to 4.5% allows the sludge storage tank to hold sludge for a longer period. Without any thickening, sludge from an activated sludge facility is typically less than 1%.

Staying with the liquid sludge process that the city currently uses can provide significant cost savings to the owner. By not constructing sludge dewatering and cake storage but constructing liquid sludge storage instead the cost savings would be $1,890,000. These cost savings reflect the construction of a new liquid sludge storage tank. If the existing liquid sludge storage tank can be reused at the new facility site, there would be additional cost savings of $750,000. The connection to allow for sludge dewatering can be constructed with the new facility to allow this process to be added to the facility as part of a future project.

The disadvantage is continuing with a liquid sludge process is the increased cost for land application and the restrictions of a class B sludge. The time that sludge can be stored for is also decreased with a liquid sludge process. For the liquid sludge process, sludge would need to be removed from the storage tank at least every 3 months, if not more often. For the cake sludge process, sludge could be stored for a year before requiring removal.

Bidding Separate Contracts

The sixth value engineering measure identified involves splitting the work required into logical pieces and bidding each piece separately. The goal of this measure is to reduce the layers of contractors' markup and allow for greater levels of competition. When the work is broken into small pieces, local contractors who may not be able to handle the complete project may be able to compete for one of the smaller pieces.

For Webster City's facility, three pieces can be defined to reduce the size of the project. Those three pieces are the existing site modifications, the influent force main, and the new site facility construction. Existing site modifications could include the bar screen and grit system renovations, wet well modifications, pump installation, demolition, and wet weather storage lagoon construction. Demolitions and wet weather storage lagoon construction would have to wait until the new facility is constructed before these items could be completed. The influent force main construction is specialized and the contractor building the new facility would likely subcontract this work. Making this section of work an individual project would allow the contractors who do this work to directly bid for it and removes the added markup of having a general contractor subcontract this work. The final piece would be the new facility and treatment train. This would be the largest portion of the work and requires the largest contractor to complete this.

Cost savings for bidding on the project as separate contracts were estimated by removing 10% of the cost associated with the separate project component. The value of 10% was used as a general figure for what the large primary contractor's markup would be on the work that is subcontracted to them. The cost savings for this engineering value measure is $600,000. These savings may also be increased since allowing smaller contractors to independently bid on pieces of the work will allow for greater bidding competition. This also can provide smaller local contractors with the opportunity to bid on this project. While this does provide some advantages, this will create more contracts that require oversight. This will require this city to have three separate contracts for each project aspect. It will also require effective communication between the contractors to be facilitated by the owner and engineer.

Alternatives Summary

These six alternatives can be implemented in any combination. The value engineering measures can be summarized as only providing screening and grit removal at one location, locating the flow equalization lagoon at the existing facilities site after demolition, reducing the overall design capacity to avoid overdesign, increasing industrial pretreatment requirements, bidding the sludge dewatering as an alternate option, and bid the project as three separate pieces. Each is intended to provide Webster City with information for consideration to aid in making whichever decision best meets their needs.

Table 3 - Value engineering measures cost savings summary.

Value Engineering Measure	Associated Cost Savings
Bar Screen and Grit Removal	$580,000
Flow Equalization	$1,870,000
Design Loadings	$2,360,000
Increased Pretreatment Requirements	$2,000,000
Biosolids Process	$1,890,000
Bidding Separate Contracts	$600,000
Total Cost Savings	$9,300,000

The total cost savings from all the value engineering measures is $9,300,000 as shown in Table 2. If the increased industrial pretreatment limits are not applicable, the total cost savings become $7,300,000. A savings of $7,300,000 reduces the total project cost from $56,830,000 to $49,530,000. This represents a 13% reduction in overall cost, which may be amplified when additional savings associated with general conditions, mechanical, electrical, and instrumentation and controls are included. In any combination, these value engineering measures help save the city on the total project cost.

Modeling of Additional Biological Processes

Within the facility plan, each biological treatment alternative selected was an activated sludge process with a similar schematic operation. In the possible alternatives section of the facility plan, some new and advanced treatment processes were eliminated. Two processes that were eliminated are membrane bioreactors and sequencing batch reactors. Sequencing batch reactors can be coupled with Aerobic Granular Sludge and can provide space and energy savings. These alternate processes have many beneficial aspects that can make them advantageous potential options for use in Webster City wastewater treatment facility.

For the reasons noted, membrane bioreactors and aerobic granular sludge sequencing batch reactors were modeled, and the results were compared to the current system that is proposed for treatment facility improvements. The current selected design alternative is modeled in BioWin as part of the facility plan analysis. The effluent values from this model are the values that were used for comparison with the This provides an efficient way to see the feasibility and advantages or disadvantages of these systems. It also provides Webster City with additional information for their consideration in the construction of their new facility.

Modeling these additional biological treatment processes intends to demonstrate that they have the capabilities to meet the treatment limits and provide effluent quality equal to or better than the selected design alternative. Price information was not developed for these alternatives due to the proprietary nature of the process. General cost information is not available for these systems.

The model software used to evaluate these processes is BioWin from EnviroSim Version 6.2. This software uses well-recognized activated sludge models (ASM1, ASM2, ASM2d, ASM3, ADM1) to evaluate the operational effectiveness of various processes.

The parameters used for these models will be based on the flows and loadings developed in the facility plan. These flows and loadings are provided in detail in Table 3 below. Using these flows and loadings for the model provides the benefit of allowing for direct comparison to the currently proposed alternatives. All simulations with be done at average conditions with the average wet weather flow of 4.586 MGD used for the flow value. It is important to use the same design parameters for comparison of the potential savings from using these alternative technologies. This ensures that the only variable being evaluated is the treatment process. These flows and loadings are conservative, and the city may see additional benefits from reducing these loads as described in the value engineering measures.

Table 4 - Model wastewater loading parameters.

Constituent	Mass Loading (ppd)	Concentration Loading (mg/L)
CBOD	7,446	194.7
TSS	8,104	211.9
TKN	845	22.1
P	145	3.79

Membrane Bioreactors

Membrane Bioreactors (MBR) have excellent solids separation capabilities and take up less space than conventional clarifiers. The US EPA outlines the main advantages of MBR as having better effluent quality, smaller space requirements, ease of automation, the capability to operate effectively with a wide range of hydraulic retention times, and the ability to allow extended solids retention times. The high-quality effluent also provides advantages for future scenarios of water reuse and even future increased effluent limitations. Figure 7 below provides a general schematic for MBR operation and an example membrane. The treatment operation is extremely consistent, and it is unlikely to see any TSS violations with this process. Sipma et al (2010) also

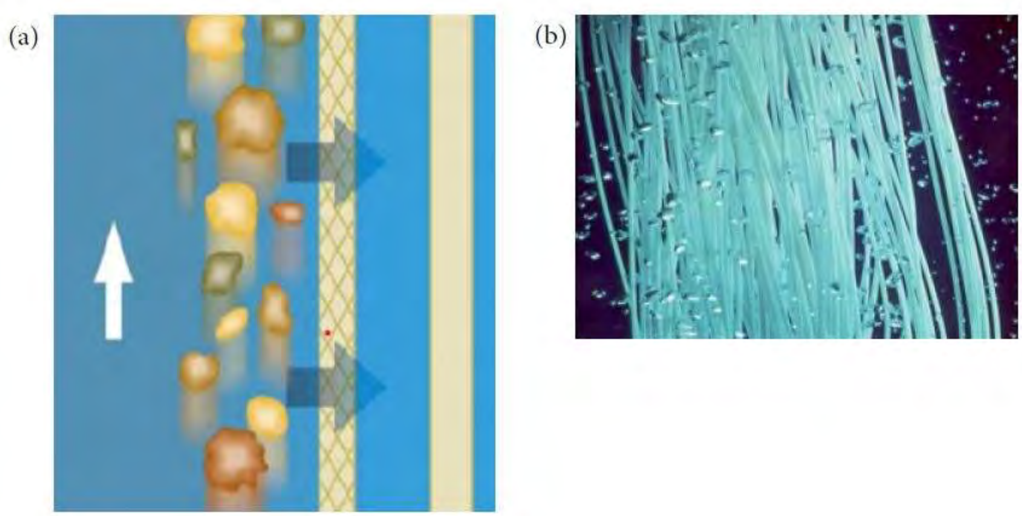

Figure 7 - (a) Membrane filtration process (Image from Siemens/U.S. Filter), (b) Hollow-fiber membranes (Image from GE/Zenon), Adapted Figures 1 and 2 from US EPA Wastewater Management Fact Sheet on Membrane Bioreactors.

found that MBR treatment technologies are more effective than CAS in removing pharmaceuticals and some other emerging pollutants.

There are many different configurations possible with MBR systems. Meng et al (2011) outlines 13 different MBR configurations that have been applied to various systems. For Webster City's system, the best configuration would be to use MBR instead of final clarifiers. This will lead to significant space savings and provide the city with robust treatment technology.

There are some disadvantages with MBR systems, which is the primary reason they were initially eliminated. The US EPA notes the disadvantages as generally higher capital costs. The cost included membrane fouling reduction, membrane cleaning, and eventual replacement of the membranes. The reactor membranes have a shorter life than other equipment requiring replacement more often. Even with these drawbacks, the potential space savings, and increased effluent quality give MBR the potential to be a very effective treatment technique.

To generate the UCT MBR model, the volumes and water depth from the facility plan were used. This allows the model to be consistent with what is currently shown. The anaerobic zone includes a tank of 290,000 gal with a depth of 18 feet. The anoxic zone includes two tanks of 250,000 gal each with a depth of 17 feet. The aerobic zone includes four tanks of 650,000 gal each with a depth of 16 feet. Based on the recommend design flow configuration in the textbook Biological Wastewater Treatment by Grady et al., the return activates sludge (RAS) flow was

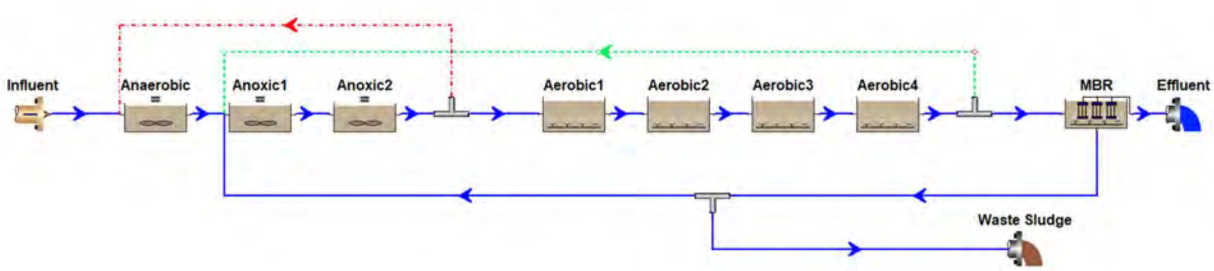

Figure 8 - Selected process alternative of UCT Activated sludge modeled with MBR replacing the final clarifiers.

paced at 100% of the influent flow, the nitrate rich or mixed liquor return (NR) was paced at 400% of the influent flow, and the nitrate free return (AR) was paced at 200% of the influent flow. These flows return to the tanks in the system as shown in Figure 2. An anaerobic MBR was then sized using an iterative process to meet the effluent limits.

Using BioWin, the selected alternative of UCT activated sludge was paired with MBR in place of clarifiers to vary the treatment capabilities. Figure 8 shows the model layout that was used for this evaluation. A steady-state simulation was completed for this process. The simulation results reflect that the MBR process can achieve higher effluent standards and remove the space requirement of clarifiers. The values of the primary constituents of concern are listed in Table 4 below. The most notable decrease is in the value of TSS. MBRs are known to reduce TSS concentrations to effectively zero when used in practice. This emphasizes the positive implications that MBR systems can have for future water reuse case scenarios. MBR also takes up very little space relative to clarifiers. Currently, the footprint of the clarifiers is approximately 16,000 ft^2 or 0.37 acres. The MBR system would be able to fit into an approximately 600 ft^2 land area. This provides very large space savings. This space savings is likely not enough to allow the facility to be constructed at the old site but would reduce the land required for the new facility and allow for more space to be available at the site for future expansion.

Table 5 – Modeled MBR effluent quality comparison.

Constituent	Clarifier Simulated Effluent Concentration (mg/L)	MBR Simulated Effluent Concentration (mg/L)
BOD	4.27	0.51
TSS	16.18	0.00
TN	4.20	2.58
TP	0.43	0.36

Sequencing Batch Reactors with Aerobic Granular Sludge

The original research relating to aerobic granular sludge (AGS) occurred in 1997 by E. Morgenroth et al. and the process has received lots of attention since then. With granular sludge, different environments can exist within the same system. Nancharaiah and Reddy (2018) explain that due to granule size, aerobic, anoxic, and anaerobic zones are present in the AGS particles. These particles contain nitrifiers, denitrifiers, and phosphate-accumulating organisms. Figure 9 provides a visual depiction of how their environments exist. AGS has outstanding settleability, such that no traditional or integrated solids separation process is required to remove solids from the system. This also allows for very effective biomass retention (de Bruin et al., 2013). The use of sequencing batch reactors (SBR) is also very important for AGS operation. Hamza et al. (2022) that SBRs are ideal because they provide the greatest control over hydrodynamic shear

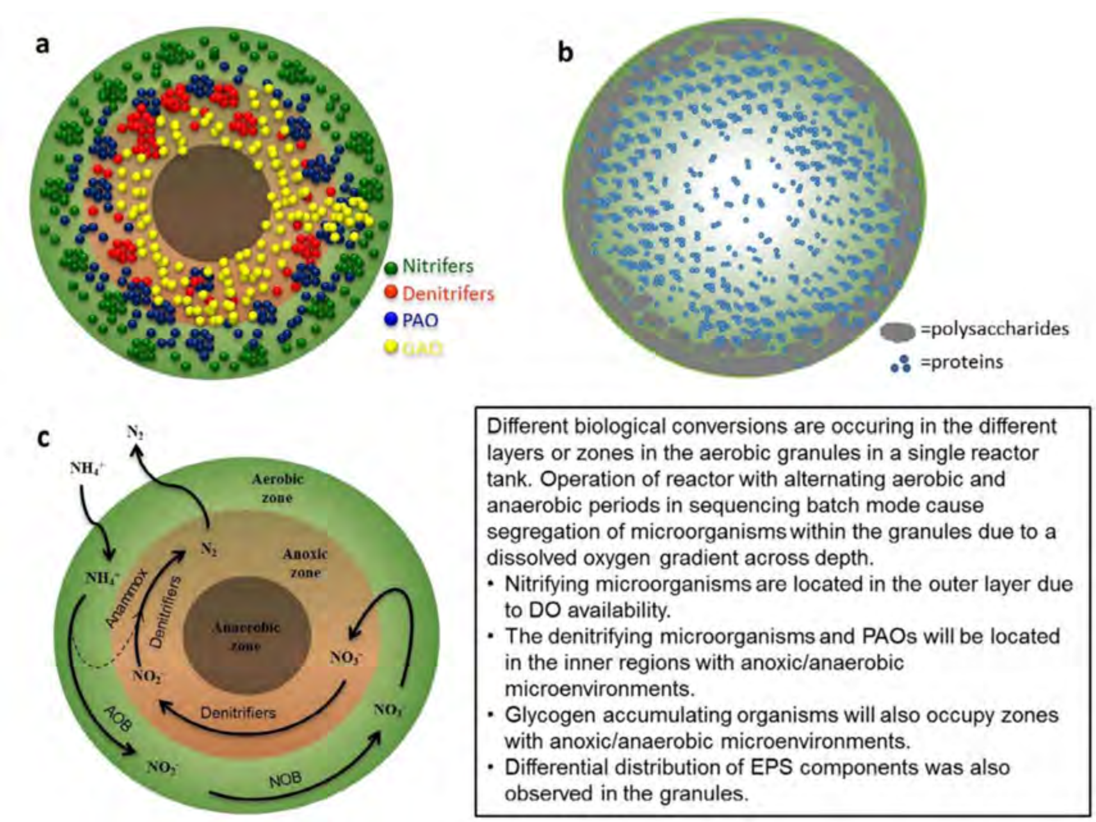

Figure 9 - Visual representation of segregated distribution of (a) microorganisms, (b) carbohydrates and proteins of the EPS matrix, and (c) nitrogen pathways. (Nancharaiah and Reddy, 2018)

forces, feeding strategy, feast-famine regime, dissolved oxygen concentration, solids retention time, and hydraulic retention time. These are the main parameters that determine the effectiveness achieved in culturing AGS.

Sequencing Batch Reactors with Aerobic Granular Sludge (SBR-AGS) are the most prominent and tested application of AGS. In 2011, there were fewer than 10 full-scale AGS applications but that number had grown to over 80 in 2021 (Hamza et al., 2022). Most of these are SBR facilities and have had success with this technology. This trend also provides evidence for the increasing popularity of this treatment alternative. This is primarily due to the presence of all necessary microorganisms in the granular sludge and granular sludge's increased settleability allowing for biological nutrient removal processes and solids separation can occur in one reactor. This greatly reduces the space and energy required for this treatment process. De Sousa Rollemberg et al. (2018) note that aerobic granular sludge can provide a 20-25% reduction in operational costs and a 50-75% reduction in space required. This provides a significant advantage in areas that are space constrained. These factors provide the reasoning for modeling and evaluating the potential applicability of SBR-AGS.

There are some potential disadvantages associated with SBR-AGS. Xia et al. (2018) reviewed and noted the importance of seed sludge on granule formation. Without the proper seed sludge, granulation may be difficult to culture or be unstable. As previously noted, there are many factors affecting the culturing of AGS. If these many aspects are not properly managed, the long-term stability of the granular sludge will be negatively impacted. Nancharaiah and Reddy (2018) also note that long-term stability can be negatively impacted by low-loading conditions. Even with the drawbacks, many applications show that SBR-AGS can be an effective treatment technique.

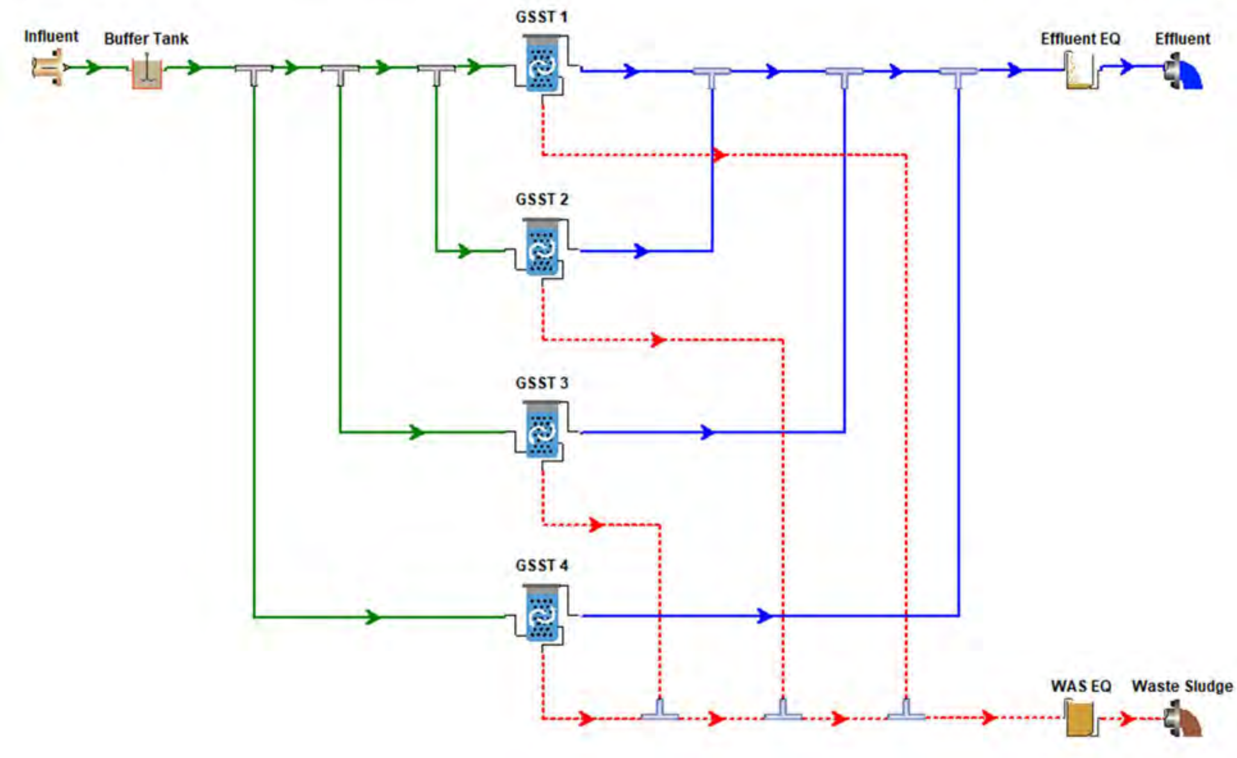

Figure 10 - BioWin model for sequencing batch reactors with aerobic granular sludge

BioWin was used to simulate the treatment capabilities of aerobic granular sludge. The layout used in BioWin is shown in Figure 10. This layout includes a buffer tank to ensure constant flow during the filling period, and four reactors in parallel to provide redundancy and enough capacity to meet the treatment demands. These SBRs had a total cycle time of 6 hours. The cycle details are provided in Table 5. During the waste phase, sludge was wasted at a rate of 2400 m^3/d, to a total wastage rate equal to 2.3% of the total influent flow. These cycles were offset by 1.5 hours so to allow continuous flow into the SBR-AGS, this is an additional benefit of the four-reactor layout. Each reactor has a volume of 0.66 MG. The results from the simulation can be found in Table 6. A total of 8 cycles were run after a seeding period to determine the values for the effluent parameters. These results are compared to the results of the UCT process that was modeled as the current design alternative.

Table 6 - SBR-AGS Cycle Details

Time (hours)	GSST 1	GSST 2	GSST 3	GSST 4
0	Mix/React	Mix/React	Mix/React	Feed
0.25	Mix/React	Mix/React	Mix/React	Feed
0.5	Mix/React	Mix/React	Settle	Feed
0.75	Mix/React	Mix/React	Settle	Feed
1	Mix/React	Mix/React	Waste	Feed
1.25	Mix/React	Mix/React	Feed	Mix/React
1.5	Mix/React	Mix/React	Feed	Mix/React
1.75	Mix/React	Mix/React	Feed	Mix/React
2	Mix/React	Settle	Feed	Mix/React
2.25	Mix/React	Settle	Feed	Mix/React
2.5	Mix/React	Waste	Feed	Mix/React
2.75	Mix/React	Feed	Decant	Mix/React
3	Mix/React	Feed	Mix/React	Mix/React
3.25	Mix/React	Feed	Mix/React	Mix/React
3.5	Settle	Feed	Mix/React	Mix/React
3.75	Settle	Feed	Mix/React	Mix/React
4	Waste	Feed	Mix/React	Mix/React
4.25	Feed	Decant	Mix/React	Mix/React
4.5	Feed	Mix/React	Mix/React	Mix/React
4.75	Feed	Mix/React	Mix/React	Mix/React
5	Feed	Mix/React	Mix/React	Settle
5.25	Feed	Mix/React	Mix/React	Settle
5.5	Feed	Mix/React	Mix/React	Waste
5.75	Decant	Mix/React	Mix/React	Feed
6	Mix/React	Mix/React	Mix/React	Feed

Table 7 – Modeled SBR-AGS effluent quality comparison

Constituent	UCT Simulated Effluent Concentration (mg/L)	SBR-AGS Simulated Effluent Concentration (mg/L)
BOD	4.27	6.50
TSS	16.18	5.50
TN	4.20	1.50
TP	0.43	0.47

These results show that SBR-AGS achieved the same or better performance than the selected UCT process. The space savings from SBR-AGS are very large as well. Four 0.66 MG reactors, for a total of 2.64 MG are required to achieve biological nutrient removal and solids separation with SBR-AGS. The currently selected alternative requires 5.00 MG of volume for the treatment process. The depth in the SBR-AGS even further reduces the land requirement. The space required for the four SBR-AGS layout would be approximately 18,000 ft^2 compared to the approximately 42,000 ft^2 of space required for the UCT process. The SBR-AGS process provides consistent and flexible treatment that can be constantly tuned to meet all of Webster City's treatment needs. This alternative can be expensive in some case scenarios, as there is only one primary supplier of this equipment required for this process. The alternative does provide merit to be considered for Webster City. The SBR-AGS process can most effectively be applied to situations like Webster City's where there is very little reuse of existing infrastructure, and the new facility will be constructed at a new site.

Additionally, conventional SBRs can also be a viable design alternative. The operation of a conventional SBR is similar to the SBR-AGS, the main difference being the flow path for these reactors. This alternative can provide consistent treatment provided in a small footprint like SBR-AGS. Similar sized SBR projects, in terms of both flows and loadings, in Iowa have had a construction cost of approximately $25,000,000. This does not include the cost of flow equalization or the force main to reach the new site. The total project cost would be approximately $45,000,000. This provides additional cost savings beyond the estimated saving included in the value engineering measures.

Conclusion

A variety of possible measures that can help Webster City reduce the cost of its new treatment facility are outlined in this value engineering analysis. These alternatives should be additionally discussed with the design engineer to incorporate into the new facility plans and specifications as the city determines is necessary. Any number of these options can be provided for Webster City, which is determined to effectively meet their needs. The objective of providing alternative treatment options was to provide the city with more information for consideration to use as best fits their specific needs. An alternative process may also be considered to save space and provide increased effluent quality. For those reasons, the two alternative processes outlined have the potential to provide added benefit to Webster City. The currently proposed alternative will also effectively meet all the new effluent limitations as outlined in the facility plan, and the value engineering measure outlined can help make that process more affordable.

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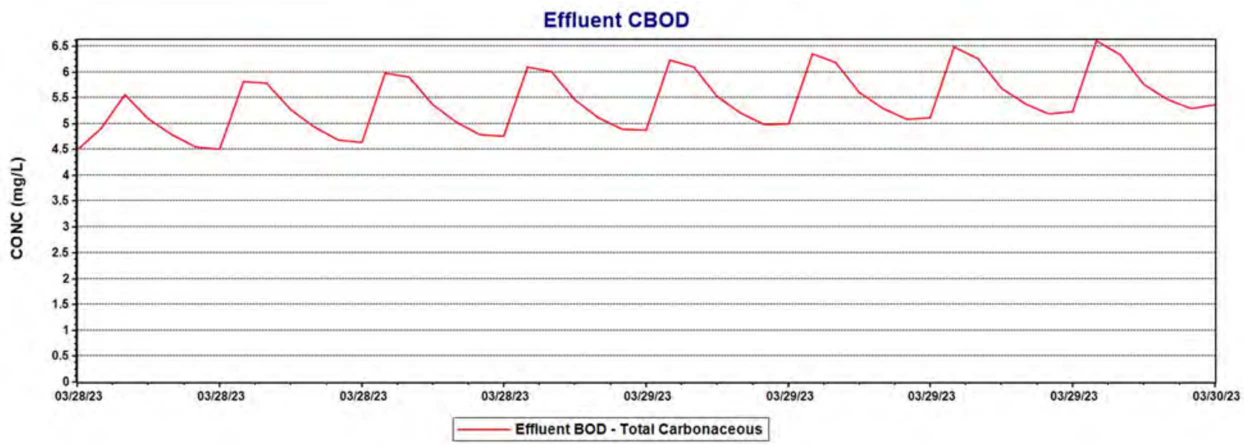
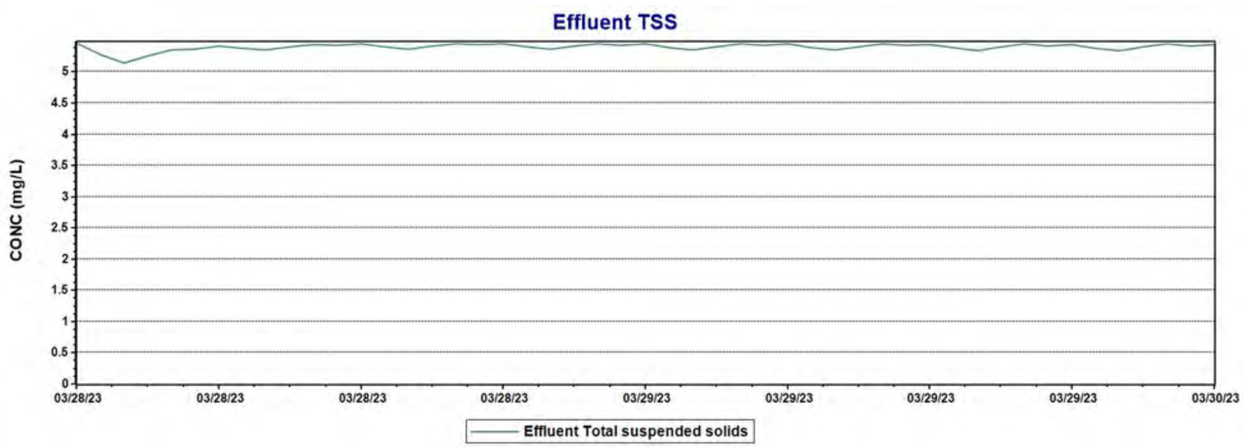
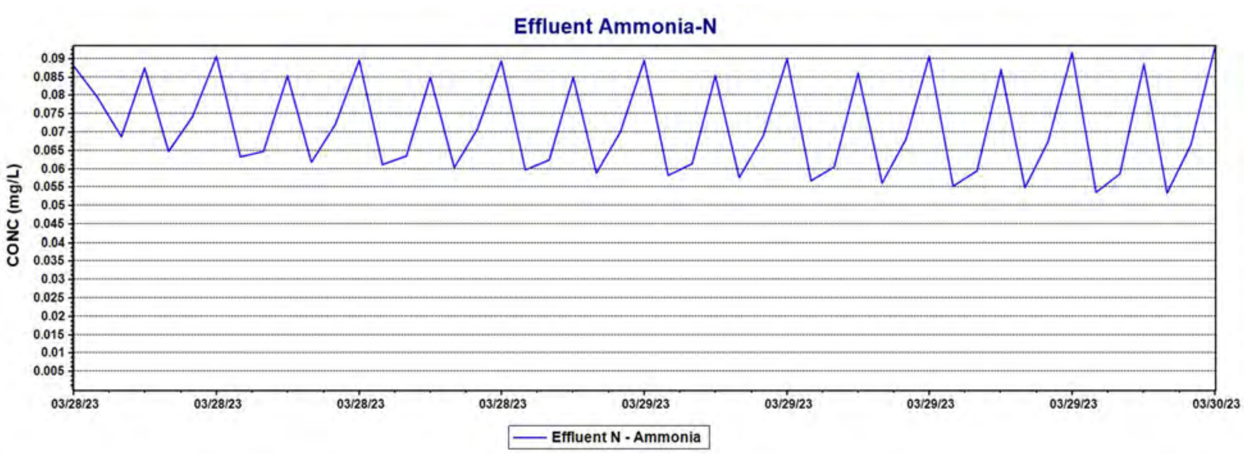
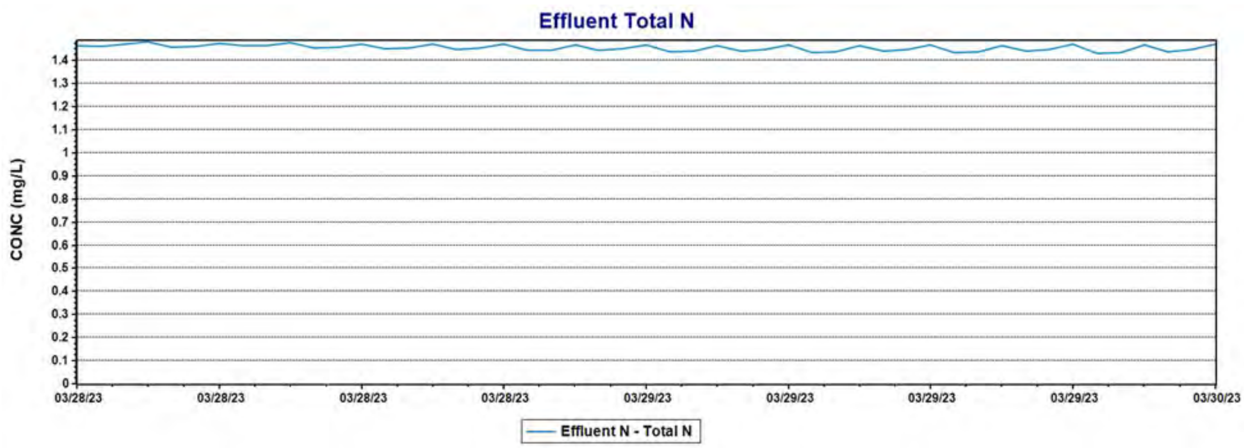
Appendix A

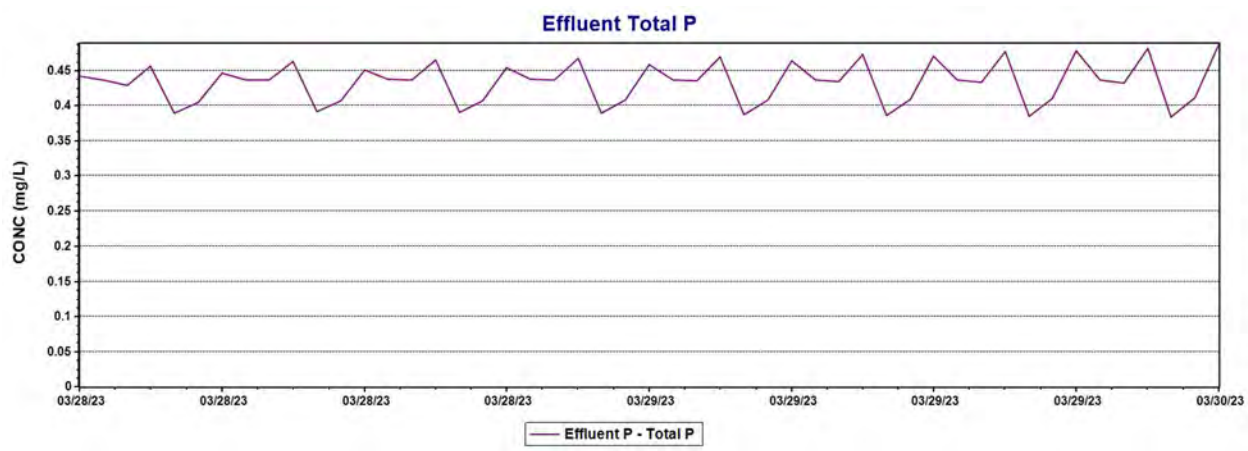
Sequencing Batch Reactor with Aerobic Granular Sludge Simulation Results



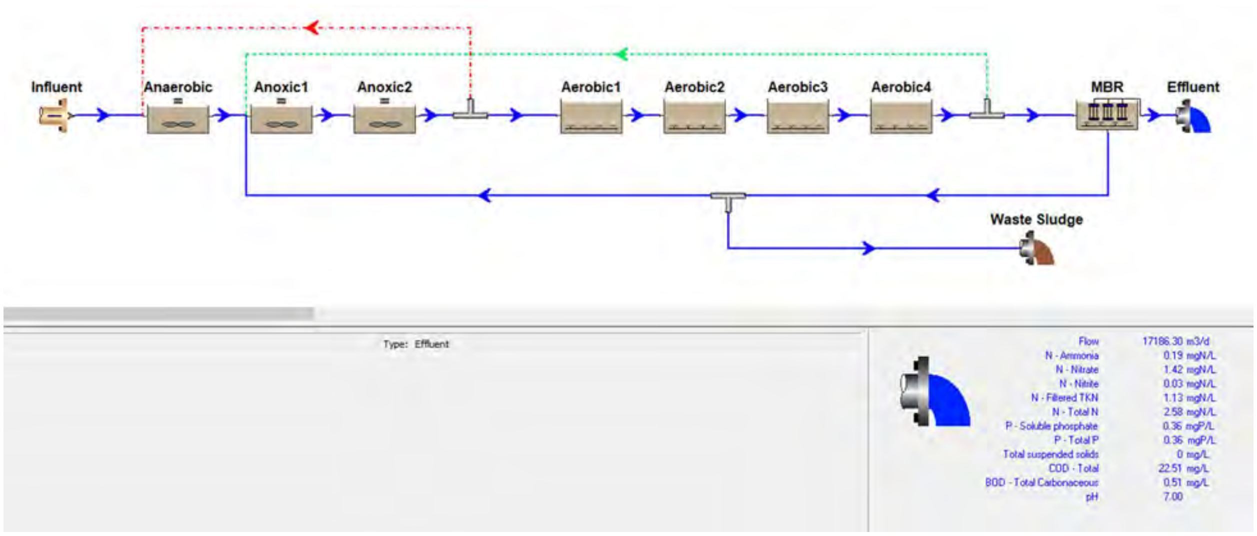








UCT Process with MBR BioWin Results



Memorandum

To: Daniel Ortiz-Hernandez, ICMA-CM, City Manager
Biridiana Bishop, Asst. City Manager
Nick Knowles, Water & Wastewater Plant Supervisor
Greg Sindt, P.E., Bolton & Menk
Andrew Sindt, P.E., Bolton & Menk

Date: July 10, 2023

From: Jim Lund, P.E.

CC: John Haldeman, P.E.
Darin Jacobs, P.E.

RE: Webster City Facility Plan – Value Engineering Review

INTRODUCTION:

The primary goal for this first phase of the Facility Plan Value Engineering Review is an overall review of the 2022 Facility Plan prepared by Bolton & Menk, Inc. to specifically locate and suggest possible capital cost saving measures. Our scope of work on this first phase is listed below (1 – 6). The City may request a more detailed second phase of Value Engineering Review during the final design and construction documents preparation.

1. An overall review of the existing Facility Plan and its recommendations.
2. A review of the recommended treatment processes.
3. A review of other recommended improvements to be included with the project.
4. A review of the project cost estimates included with the Facility Plan.
5. A review of the project operating costs included with the Facility Plan.
6. Providing a written memo (a.) with a summary assessment of the selected processes and items for consideration; (b.) regarding cost estimates and considerations; (c.) regarding operating cost estimates and considerations.

Value Engineering reviews will typically include an analysis of operating costs which rolls into a life-cycle cost analysis. Snyder and Associates did not evaluate detailed operating costs as detailed Operation & Maintenance (O&M) costs are not presented in the Facility Plan. Our effort was therefore directed towards reducing capital costs after reviewing the recommended treatment process. It is certain that several cost saving ideas may be available but not all may be practical for one reason or another. It is also not possible to outline every combination in this document. We have instead concentrated on large impact items. The treatment system recommended in the facility plan is certainly capable of meeting current DNR requirements. Changes to the plan to reduce cost will require difficult decisions. Those decisions could include modifications ranging from constructing all or part of the proposed improvements on the existing WWTP site, modifying the City's growth projections which would change the anticipated flows and loads, considering another type of treatment process, and/or changing the approach to biosolids management.

The issue of constructing new components on the existing site comes into focus if the force main(s) to the new site is eliminated to reduce cost. This would be possible if there if there is sufficient space for the Equalization Basin (EQB) on the existing site. There may be other valid reasons that conflict with new construction on the existing site such as current site use, Street Dept. occupancy, green space consideration, proximity of existing residences, etc. None-the-less, these do not preclude construction but may be enough reason for the City to choose to not re-use the existing site. According to the Hamilton County GIS mapping database, the City owns more than 53 acres at the existing plant site; of that, approximately 35 acres is outside of the floodway and is buildable land. The Street Department currently occupies some of this land and there is a dedicated green space. Again, this is not an easy decision due to the proximity of the facilities to nearby residences and odors associated with the facilities, but could substantially reduce initial cost.

Section IV of the Facility Plan discusses seven technologies or variations of technologies and whether they would be evaluated further for use in Webster City:

1. Aerated lagoons: Snyder and Associates agrees with the evaluation in that aerated lagoons will not consistently reduce nitrogen through cold temperature seasons, and they will not remove a significant mass of phosphorous.
2. Constructed Wetlands: Snyder and Associates agrees that the flows and loads are high enough that significant land area would be consumed, and cold climate operation is a problem.
3. Variations of the activated sludge biological treatment process: extended aeration, oxidation ditch, sequencing batch reactor, membrane bioreactor, biological aerated filter, integrated fixed-film activated sludge, and moving-bed bioreactor are all technologies that could be made to work. Each one has specific characteristics, as described in the Facility Plan, which may result in a "No Further Consideration" decision. Extended aeration active sludge, oxidation ditch, and sequencing batch reactors are the three most feasible when considering capital cost, operational complexity, operating and maintenance costs, and site constraints. These three technologies are common and proven and have the ability to reduce nutrients to satisfy the state of Iowa's Nutrient Reduction Strategy (NRS). They should receive further consideration.

During this evaluation, a few important items were the point of concentration. The first item reviewed was the City's growth projections which affects flow and load projections for the future. This is a very important and difficult exercise since predicting the future is challenging. We understand that the *City completed growth projections in 2016* and that data is included in Appendix C of the Facility Plan document. An analysis of flow and load projection based on this population growth is discussed below. This item could present a significant effect to the cost of the treatment plant. As a related item, perhaps a modular plant design, which readily lends itself to expansion if/when future loads develop, should be a high priority. This type of design, with phased construction, is often implemented when large growth – higher than the trends of other local communities - is anticipated, and certain processes lend themselves well to this concept while others do not. **The City of Coralville completed their most recent upgrade in July 2020. The new wastewater improvements were designed to accommodate growth thru 2030, a ten-year planning period.** We also note that future construction costs will be higher due to simple cost inflation. In order to accommodate future construction in the shortest possible time, the entire full-build plant should be designed and submitted to IDNR as part of the construction permit application, with the future components clearly identified. This will reduce the design-review-approval time frame for future construction. The future components, identified in this memo, could then go directly to bidding on an expedited schedule. The bid-award-construction of the future components could be a 12–18-month time frame compared to a 24-48-month time frame if starting at the design stage.

A particularly important part of the new design is related to the Iowa Nutrient Reduction Strategy (NRS) as implemented by the Iowa DNR. A national nutrient reduction effort was initiated by the US EPA for which a framework was released in 2011. This effort was driven by the desire to reduce the hypoxic episodes in the Gulf of Mexico. Iowa's NRS was released for public comment in 2012. The combined effort of Iowa State University, Iowa DNR, and the Iowa Department of Agriculture was to assess and reduce nutrient loading using an integrated strategy for point sources and nonpoint sources (Pg 1, Exec. Summary of 2012 Iowa NRS report.) The point source policy is intended to focus on technology practices that offer the most "bang for the buck" at reducing nitrogen and phosphorus loading. The forthcoming discharge permits for the major facilities would require implementation of technically **and economically feasible** process changes to achieve targeted reductions of at least two-thirds (66%) of the nitrogen and three-fourths (75%) of the phosphorous from current levels (Pg 2, Exec. Summary). Further, <u>nonpoint source strategies</u> included ***nutrient trading*** and other innovative approaches (Pg 3, Exec. Summary). It was acknowledged that nutrient reduction would not be easy, but the effort should be made to improve Iowa's water quality while at the same time ensuring the state's continued, reasonable economic growth and prosperity.

The Iowa NRS is not intended to rely solely on construction of wastewater treatment plants to meet goals of 10 mg/l TN and 1 mg/l TP. A wastewater treatment facility can certainly achieve this, but the overall plan needs to be affordable for the users. Nutrient reductions of 66% TN and 75% TP can be consistently achieved by current wastewater treatment technology, and nutrient trading could be used to augment this to achieve the annual average mass limits equivalent to 10 mg/l TN and 1 mg/l TP. Nutrient trading means setting a goal for the total amount of nutrients entering a surface water and allowing both point and nonpoint sources to trade nutrient reduction credits in order to meet the goal.

Section 3, Pg 186 of the 2012 NRS Report - "Point Source Nutrient Reduction Technology Assessment and Implementation Plan" says: "The primary mechanism IDNR will use in assessing the "reasonableness" of nutrient removal for individual facilities is the estimated costs for improvements and the ability of end users to afford those costs.” Typically, if the cost of the wastewater treatment project is < 1% of the median household income (MHI), then the project is affordable. If the cost is > 2% MHI then the project is not affordable. Webster City’s MHI is $55,000/yr. The City of Ames recently modified their wastewater treatment project to a 2-phase approach in order to ease the cost burden on their residents. They will use a 10-year period for implementation of phase 1. Phase 2 will be put into action, if necessary, after the 10th year.

Assuming a project is affordable any recommended process should be capable of meeting the goals of the NRS. The ultimate goal of the NRS- is meeting annual average effluent values of 10 mg/l Total Nitrogen (TN) and 1 mg/l Total Phosphorus (TP) for typical domestic strength wastewater as discharged from point sources greater than 1 MGD. For wastewater with a significant (significant is undefined in NRS report) industrial component or strength greater than typical domestic, the NRS goals are 66% removal of TN and 75% removal of TP as discussed above. The wastewater generated within Webster City exhibits strength greater than typical domestic, as stated on page 6 of the August 2022 Facility Plan. The CBOD and TSS in Webster City is twice the typical value used by IDNR for design values and the total Kjeldahl nitrogen (TKN) is 31% higher than the typical value. **Therefore, the NRS goal applicable to Webster City is 66% removal of TN and 75% removal of TP**.

Many of the top performing activated sludge-type treatment plants in the state are easily meeting the 66% and 75% removal which the IDNR considers this excellent performance, but are not meeting the 10 mg/l TN and 1 mg/l TP annual average limit goals. . To provide comparison, 66% TN removal would require final effluent at approximately 12 mg/l as compared to the goal of 10 mg/l. At 75% TP effluent would be approximately 2.25 mg/l as compared to the goal of 1 mg/l. The cost of removal tends to increase substantially as the final numerical goal gets smaller. Meeting the NRS removal percentages can be accomplished with conventional equipment and processes. Nutrient trading can be used to augment this and to achieve the equivalent of the annual average TN and TP limits. The proposed University of Cape Town (UCT) process, which is conventional extended aeration activated sludge with nutrient removal, is designed to meet the 10 mg/l TN and 1 mg/l TP limits and includes the processes and equipment to do so (see pg. 83 article V. C. of Fac. Plan). Perhaps the new design could accommodate this equipment in the future, but it would not be constructed at this time, thereby reducing costs. Phasing construction to correlate with the demand created by a 5-to-10-year growth projection (Coralville and Ames used 10-year periods) is commonly done when growth projections exceed historical trends. Delaying construction until a future date would also subject the cost of those items to inflationary increases.

In order to provide a bookend for cost comparison, this analysis performed a cursory comparison of the Sequencing Batch Reactors (SBR) treatment technology. In recent years, SBR technology has tended to be the least expensive of the activated sludge variants and has a proven record of performance, including nutrient reduction, according to Iowa DNR. Therefore, the SBR was used as the lowest cost system for comparison. In addition, the SBR process is modular and readily lends itself to phased construction if needed for future capacity expansion. There are other technologies that can also achieve the performance goals of this project. The oxidation ditch technology has also been proven as a capable nutrient reduction technology.

Comparing the SBR and the UCT technologies, both are activated sludge. The SBR will use fewer tanks as the fermentation and nutrient removal treatment processes take place within one tank. The separate Return Activated Sludge (RAS) Fermenter and Nutrient Removal basins are not needed. There would be no clarifiers required for the SBR alternate as the settling process also occurs within the same basin as the anaerobic, anoxic, and aeration treatment processes. There are no large RAS pumps associated with the SBR system. There will be smaller Waste Activated Sludge (WAS) pumps to pump biosolids from the SBR tank to the aerobic digester. WAS is typically a smaller volume which is pumped at lower rates, hence smaller pumps.

There would be pumps associated with the jet-mix system used by some of the SBR vendors. Jet-mix systems allow for use of smaller aeration blowers. Other vendors utilize fine-bubble aeration grid to provide mixing and aeration, similar to the UCT process, in which case larger blowers replace the jet-mix pumps.

In summary, the UCT process, as designed here, is capable of treating the City's wastewater and reducing nutrient concentrations below the required Total Nitrogen and Total Phosphorus levels (10 mg/l TN and 1 mg/l TP). The SBR process, as described, is capable of treating the City's wastewater and reducing nutrient concentrations below the required Total Nitrogen and Total Phosphorus levels (by 66% for TN and 75% for TP) thereby meeting the requirements of the Iowa NRS, and doing so at a lower initial capital cost, as described below. An SBR system can routinely achieve TN concentrations of < 10mg/l, and TP concentrations of < 2 mg/l on monthly averages.

Regarding the estimated capital cost included in the Facility Plan, Snyder and Associates believes it generally reflects the current pricing environment presented over the past 12 months for the equipment and materials listed. We do not know the unit costs, nor the quantities used to prepare the estimate so we cannot comment on specific materials, i.e., earthwork and concrete. The equipment costs appear to be in line with typical budgetary costs offered by vendors at the facility planning stage.

In addition, regarding Infiltration and Inflow (I/I), we understand that the City has been budgeting around $500,000/year for I/I removal but that is scheduled to be reduced to $100,000 to $200,000 per year starting in 2025. I/I removal is an important effort for all communities with sanitary sewer systems. The effort to reduce the volume and rate of clear water entering the sanitary sewer can be relatively expensive on a per gallon cost. Each community needs to weigh the cost versus the benefits. Quantifying the volume and rate of I/I is the first step to managing this effort. Typically, 20%-30% removal is considered successful.

Webster City Population Data

Historical populations

Year	Pop.	±%
1870	1,339	—
1880	1,848	+38.0%
1890	2,829	+53.1%
1900	4,613	+63.1%
1910	5,208	+12.9%
1920	5,657	+8.6%
1930	7,024	+24.2%
1940	6,738	−4.1%
1950	7,611	+13.0%
1960	8,520	+11.9%
1970	8,488	−0.4%
1980	8,572	+1.0%
1990	7,894	−7.9%
2000	8,176	+3.6%
2010	8,070	−1.3%
2020	7,825	−3.0%

Source: *"U.S. Census website". United States Census Bureau. Retrieved 2020-03-29* and Iowa Data Center
Source: U.S. Decennial Census[10]

DISCUSSION

1. Flows & Loadings/Population Growth and Industrial Capacities: The Facility Plan assumes aggressive growth in both population and industrial flow/loadings. The historical population data may not support this thesis. It is our understanding when these projections were prepared by the City in 2016, the Prestage Pork Plant was considering locating near Webster City. The Prestage Plant conveyed to the City that they would run two production shifts at 1,000 persons per shift, plus a sanitizing shift. The plant has been constructed in the area but has been unable to operate more than one shift per day. As such, these employment estimates may have skewed the population growth projections.

   The Webster City population growth from 2015 (7,814 per Section II. B., pg 5 of Fac. Plan) to 2020 (7,825 per US Census) was 0.14%. This translates to a 20-yr growth rate of 0.56% and a 2040 population of 7,869. The Facility Plan also suggests a 2040 population of 11,609 (+3,795 people). This represents an overall growth of 48.5% and an average annual growth rate of 2.4% for Webster City. In comparison, the average annual growth rate for the State of Iowa between 1980 and 2020 is 0.22% or about one-tenth that of the Facility Plan's projected growth of Webster City. Two of the fastest growing municipalities in the State of Iowa, the Des Moines metro area and Cedar Rapids metro area have shown average annual growth rates of 1.76% and 0.64% respectively. Both are well below the projected annual rate for Webster City of 2.4%/year. We believe that moderating the growth considerations will offer substantial cost savings opportunities.

   The Facility Plan includes unallocated industrial capacity in the proposed Wastewater Treatment Plant (WWTP) design of 25% (1,861 lbs/d) for carbonaceous biochemical oxygen demand (CBOD), (2,026 lbs/d) for Total Suspended Solids (TSS), and (211 lbs/d) for Total Kjeldahl Nitrogen (TKN), and an additional unallocated industrial flow capacity of 11% or 0.5 Million Gallons per Day (MGD). It is our understanding that this was part of the 2016 analysis completed by the City. While the cost relationship for these allocations is not linear, in other words, they will not account for 25% of the cost, there are capital costs associated with the larger clarifiers, larger aeration basins, higher blower capacity, larger biosolids components, and larger disinfection components. In addition, it follows that if the population growth does not occur as planned, then the industrial load would likely not grow as fast as anticipated. The industrial load is related to production; production is related to the number of employees; the number of employees is related to the local population. Should the proposed plant be constructed for these loadings and the loadings do not occur and the plant is oversized which often results in operational difficulties. The plant as proposed in the Facility Plan has two trains of multiple tanks. One train could likely provide sufficient treatment capacity for several years. The IDNR has redundancy requirements for some units in any treatment facility. These would need to be addressed in the design. Phased construction could reduce the initial capital cost, however future construction would come at higher unit costs as dictated by simple economic inflation.

2. The flow data presented indicates that Infiltration and Inflow (I/I) accounts for 57% of the design Average Wet Weather (AWW) flow and 76% of the design Maximum Wet Weather (MWW). The plan does call for a 12 Million Gallon (MG) Equalization Basin (EQB) which will allow for not having to over-size the process components based on hydraulic requirements. The plan shows the EQB will be located on the new plant site south of the existing plant. The Flow Diagram, Figure 4.1 calls for new mechanical fine screening and grit removal downstream of the EQB on the new site. It is our understanding that peak flow would be diverted to the EQB upstream of the proposed fine screening and grit removal, hence the proposed new screening and grit removal facilities will be designed for the ADW/AWW flow and not the peak flows.

   Typically, there is one screening and grit removal system at a wastewater treatment plant. This situation is a bit unique in that the existing screening and grit systems upstream of the existing pump station are not as efficient as newer technology, however the existing screen and grit do provide some protection for the pump station. It is not typical to spend money on two screening and grit removal systems, however, in this instance upgrading the existing equipment, assuming the concrete is still in good condition, is a reasonable approach for the ~$600,000 estimated cost.

3. The EQB is proposed for the new (south) site. We suggest evaluating whether the EQB could be located on the existing site. If this is feasible, the new site work could be reduced by diverting the peak flow at the existing site. This would allow reducing the dual forcemain size, possibly eliminating one forcemain, and reducing the pump size to pump the equalized flow. The influent flow would be screened and de-gritted as currently proposed, but instead of pumping peak flow of 11 to 12+ MGD 1.5 miles to the new site, only the MWW of 5.1 MGD (AWW + 0.5 MGD) would need to be pumped. Smaller pumps could be used in the lift station to pump the diverted flow after screening and grit removal to the new site. Flow back to the lift station will be controlled gravity. This would reduce costs by eliminating the need for the Preliminary Treatment building and foundation at the south site. There would be corresponding cost incurred with constructing an earthern berm EQ basin on the existing site due to hauling, material storage limitations, and management of the required earthen material on a confined site. We presume that the EQ basin could be phase-constructed as the existing plant is being demolished.

   The trade-off would be that there would need to be sump and larger peak flow pumps to pump the peak flow into the EQB on the existing site, as it is understood that the existing influent sewer if too deep to allow gravity flow into the EQB. These larger pumps would only operate during peak flow events. Under normal flow conditions the smaller ADW/AWW flow pumps would pump the flow to the new site screening and grit removal systems.

4. Dual 18-inch diameter force mains are proposed to accommodate the peak flow, operate at a reasonable velocity at low flows, and to provide redundancy. These are all good reasons to provide two barrels under Highway 20 and under the railroad. A single force main could operate satisfactorily if the flow is equalized at the existing site. If the peak flow rate pumped is capped at 5.086 MGD or 3,532 gpm, the velocity would be ~ 4.5 feet per second (fps). This is acceptable for peak conditions. To maintain adequate velocity of 2 fps in an 18-inch pipe the pumps will need to be designed for a ~ 1,600 gpm flow rate. This is 2.3 MGD, which is only slightly more than the 1.99 MGD ADW flow described in the Facility Plan (Table 2.4, pg 13). This is easily done. The working volume of the wetwell will need to be sized appropriately. Also, constructing the dual barrel under Highway 20 and the railroad now would be a prudent to avoid construction delays if the second barrel were ever needed. Most communities operate pumping facilities with one forcemain. If the forcemain fails abruptly, it can normally be repaired in less than 24-hours.

   Communities do not construct parallel water mains in the event one breaks. If a water main breaks it is repaired and returned to service in a short period.
   Installation of just one forcemain, except for the Highway 20 and the railroad bores would reduce that cost by $700,000 to $1,200,000.

5. After reviewing the proposed UCT (University of Cape Town) process plant, there are several items, listed below, which provide redundancy or options for "what-ifs", such as what if there is a biological upset. Precedence shows that IDNR typically will not impose stricter limits for at least 10-years after a major upgrade is completed. This is clearly stated in Section 3, page 5 of the NRS:

   "If a permitted discharger installs nutrient reduction processes and technology-based TN and TP limits are included in the NPDES permit, then it is the position of the IDNR that the TN and TP discharge limits will not be made more restrictive for a period of at least 10-years after the completion of the nutrient reduction process construction."

   And at that point a compliance schedule would be proposed which would give another 5-years to implement any required changes. These changes also assume that the population growth follows more closely to the historical trend

   The following items could be removed completely or downsized without risking the ability of the plant to meet the NPDES permit conditions. Costs shown in this document reference information provided in the Facility Plan:

   a. Fine screen and vortex grit at the new site: Eliminate, the flow has already been coarse-screened and de-gritted before the lift station on the existing site. Estimated capital savings $1,240,000. The trade-off will be that the pumps would be pumping nominally higher grit concentrations so the pumps and discharge piping may wear marginally faster. This would likely mean the impeller and volute may need to be replaced a year or two sooner than under normal wear conditions.

b. Final Clarifiers: Eliminate one, leave space on the new site for a future third. Two 70-ft dia. final clarifiers at 1,000 gpd/sq ft hydraulic loading and 30 lbs TSS/day/sq ft at MWW will accommodate the 4.586 MGD (MWW) using the 75% IDNR criteria. At maximum flow rate the acceptable solids loading is 30 lbs TSS/sq. ft./day, which translates to an MLSS concentration in excess of 3,900 mg/l which is higher that the system would normally operate. Estimated capital savings: $900,000.

c. Rapid Mix Tank: Eliminate, leave room for it if needed in the future. This is included "in case" stricter limits are imposed or in the event there are short term biological upsets which harms sludge settleability. Estimated capital savings: $165,000. The downside is there would be no easy place to add chemicals to the process. Chemicals should not be needed on a regular basis.

d. Biosolids thickening: Eliminate the Rotary Drum Thickener (RDT), RDT holding tank, RDT feed pump, building, and Chem Feed. Most similar sized rural communities in Iowa are storing and land-spreading liquid biosolids. Estimated capital savings: $700,000. This will be somewhat offset by the need for a liquid sludge storage tank(s).

e. Biosolids Screw Press: Eliminate – see item d. Estimated capital savings: $3,625,000. We understand the City indicated a preference for dewatering sludge and managing cake-solids as opposed to liquid sludge.

The Savings Estimate described above is approximately $6,630,000.

These costs shown as estimated savings do not include all costs associated with installation and completion such as labor to install, painting, associated piping and valves, etc. The above items represent approximately 12% of the capital subtotal ($56M).

6. There would be additional savings from reducing the population, flow, and loading estimates. For instance, the aeration basins described in the UCT plant description are sized for 12 hours of hydraulic detention time (HDT) at Maximum Wet Weather (MWW). The HDT range suggested by Metcalf & Eddy is 4-12 hours for aerobic zone (Table 8-26, pg 814 of 4th Ed.) The aerobic tanks could be downsized by 30-40% and still have cushion even at the proposed MWW flow. If the flow values are reduced, then the savings will be even greater. At lower flow values the anaerobic and anoxic basins could likewise be downsized. **The organic (BOD and TKN) mass loadings, and the solids retention time (SRT) also factor into tank volumes. This analysis would need to be completed to confirm sizing requirements.**

7. The SBR technology, or other equivalent technologies such as the oxidation ditch, could also be revisited for additional savings. There are currently 10 communities of similar size to Webster City that are using SBRs for wastewater treatment (and approximately 43 communities statewide using SBR technology). We have direct experience with SBRs,

and we know they can successfully reduce nitrogen and phosphorous concentrations in municipal and industrial wastewaters. An SBR plant would consist of:

a. Screening
b. Grit Removal
c. Flow EQ (possibly)
d. Anaerobic Conditioning Tank
e. SBR Basins
f. UV Disinfection
g. Liquid Sludge Digestion

An SBR plant may possibly need to treat digester supernatant for phosphorous if it is decanted back to the process. Metcalf & Eddy, 4th Ed. pg 815 lists the Advantages of the SBR technology:

a. Both N & P removal are possible
b. Process is easy to operate
c. Mixed liquor solids cannot be washed out by hydraulic surges
d. Quiescent settling may produce lower TSS in the effluent
e. Flexible operation

The Limitations listed in the same reference are:

a. More complex operation for N & P removal. ("More complex" is in reference to being more complex than operating a plant to remove only BOD. Operating an SBR plant to remove N & P is no more complex than other extended aeration systems, and in fact some operators have reported that SBRs are simple to operate. There are no recycle streams to manage, hence no recycle pumps or controls.)
b. Some SBR manufacturers have proprietary control on their decanters. (This is the only mechanical part with any restrictions. The only other mechanical parts are pumps, aeration equipment, and perhaps some telescoping valves which are all generic. Any like-product can be used for these items.)
c. Needs larger volume than SBR for N removal only. (This is also true of all extended aeration activated sludge plants.)
d. Effluent quality depends upon reliable decanting facility. (Effluent quality of extended aeration plants likewise depends on properly operated and maintained clarifiers.)
e. Design is more complex (manufacturers are involved here). (This is a subjective comment.)
f. Skilled maintenance is required. (Same grade operator as other activated sludge technologies.)

g. More suitable for smaller flowrates – they do not define "small". (SBRs can be designed to serve any size community. They have been popular with smaller communities because smaller communities typically have fewer resources to devote to WWTP operation.)

Iowa communities which are currently using SBR technology (2020 census population):

1. Marshalltown (27,591) – operates an SBR for industrial waste treatment (PE ~120,000) and conventional activated sludge for domestic waste treatment (Design Pop. ~24,100)
2. North Liberty (PE ~28,000; Design pop. 20,479) – added MBR (membrane bioreactor) to process
3. Mount Pleasant (PE ~ 14,600; Design pop. 9,274)
4. Clear Lake (PE ~32,000; Design pop. 7,687)
5. Washington (PE ~19, 400: Design pop. 7,352)
6. Atlantic (PE ~12,000: Design pop. 6,792)
7. Oelwein (PE 16,400: Design pop. 5,920)
8. Eldridge (PE ~16,700: Design pop. 6,726)
9. Clarinda (PE ~18,500; Design pop. 5,369)
10. SI Industries, Oakland, IA (Pop. Eq. ~ 95,000)

For more information, please see the IDNR inventory spreadsheet located at:
https://www.iowadnr.gov/Portals/idnr/uploads/water/npdes/website_file.pdf?ver=BXTccFo_EPC5nc8rA6zoEw%3d%3d

According to Iowa DNR data, four of the top 10 municipal wastewater treatment plants for nitrogen removal are SBR plants and the top two of the top 10 for phosphorous removal are SBR plants as shown below:

Location - type	Total Nitrogen % Reduction	Location	Total Phosphorus % Reduction
Atlantic – SBR	95.7	Grundy Ctr. – SBR	94.6
N. Liberty – SBR-MBR	92.3	Atlantic – SBR	89.5
Clear Lake SD – SBR	91.4	Eagle Grove – Oxidation Ditch -OD	87.6
Anamosa – Activated Sludge - AS	88.6	Carroll – AS (VLR)	82.2
Dyersville – AS	86.0	Cascade – AS	82.2
Oelwein – SBR	85.6	W. Liberty – AS	82.0
Coralville – OD	85.4	N. Liberty – MBR	80.4
Wapello – Aer. Lagoon	84.7	Dyersville – AS	79.3
W. Liberty – AS	84.0	Sioux City – AS	79.1
Grundy Center - SBR	81.4	Clinton – OD	79.0
Iowa NRS Goal	66.0	**Iowa NRS Goal**	75.0

SBR = Sequencing Batch Reactor; OD = Oxidation Ditch; AS = Activated Sludge; MBR = Membrane Bioreactor; VLR = Vertical Loop Reactor

Based on preliminary information provided by one SBR technology vendor, the equipment capital cost would be approximately the same for the biological processes, however there would be significant savings in site work, cast-in-place concrete, buried yard piping, valves and gates, fittings, and equipment installation.

The Facility Plan (pg 48) lists some disadvantages or reasons to not further consider the SBR technology, including (note our comments are in italics):

1. Higher operational complexity and controls – *SBRs typically operate based on oxidation-reduction potential measurements (ORP) which is another probe in the basin along with a total suspended solids probe, a dissolved oxygen probe, and a liquid level probe. Control software provided by the manufacturer is fairly intuitive for operators having experience with activated sludge plants.*

2. Higher O&M costs – *the facility plan does not explain what these are. However, with less equipment it would reason that O&M costs would not be higher.*
3. Reliability concerns – *SBRs have a proven history of reliable operation.*
4. Limited nutrient removal capabilities – *SBRs have a proven history of nutrient removal when properly operated.*
5. Large reactor tank volume – *the facility plan also states one advantage of the SBR is reduced area required for process tanks.*

There are many SBR plants operating successfully in Iowa. All operators have preferences and comfort levels, and this situation is no different. Some operators like a particular brand of pump because they have worked on them. This doesn't necessarily one is better than the other, they are just different.

<u>CONCLUSION</u>
With phased construction based on revised loading projections, critical determinations to minimize construction items where possible, a treatment process change to Sequencing Batch Reactor (SBR), and with treatment goals aimed to meet the Iowa Nutrient Reduction Strategy, we believe based on our prior experience with similar size plants, that the overall capital cost could be reduced by $10M to $15M in initial capital cost. Such an SBR plant would likely include:

1. Screening and grit removal which may incorporate the existing facilities
2. Flow EQ
3. Anaerobic Conditioning
4. SBR sized for appropriate flow conditions; 10 mg/l TN; 1.5 mg/l TP
5. Disinfection
6. Aerobic sludge digestion
7. Liquid sludge storage

We do not know the unit costs, nor the quantities used to prepare the estimate so we cannot comment on specific materials, i.e., earthwork and concrete. The equipment costs appear to be in line with typical budgetary costs offered by vendors at the facility planning stage.

The SBR plant would **not** include the following items. These items are not required for SBR operation. Items 1 through 3 are not required. Items 4 thru 13 could be added later if needed:

1. Three Final Clarifiers & Mechanisms
2. RAS Pumps
3. Clarifier Control Structure
4. Rapid Mix Basin with Chemical Feed equipment
5. Rotary Drum Thickener Holding Tank (WAS Tank) and Feed Pumps
6. Rotary Drum Thickener
7. Filtrate Return Piping and Pumps
8. Biosolids Press Holding Tank

9. Press Feed Pumps
10. Biosolids Presses
11. Biosolids Press Building
12. Cake Solids Storage Building
13. Dewatered Biosolids Conveyors

February 28, 2023

Biridiana Bishop, Assistant City Manager
City of Webster City
400 2nd Street
Webster City, IA 50595

RE: PROFESSIONAL SERVICES AGREEMENT
VALUE ENGINEERING OF SANITARY SEWER WASTEWATER TREATMENT PLANT – PHASE 1
WEBSTER CITY, IOWA

Dear Biridiana:

Herein is Amendment No. 26 to the Webster City Agreement for Engineering Services with our Scope of Services, as requested. We trust you will find the Scope self-explanatory, however, we are flexible to your needs and are willing to discuss the Scope for mutual agreement.

Please review and provide an authorized signature of the Amendment and return a copy for our files. We are prepared to start upon receipt of the executed Amendment.

Sincerely,

SNYDER & ASSOCIATES, INC.

John W. Haldeman

John Haldeman, P.E.

Enclosure

cc: Darin Jacobs, P.E., Snyder & Associates, Inc.

WEBSTER CITY, IOWA

AMENDMENT No. 26 TO THE AGREEMENT FOR PROFESSIONAL SERVICES FOR THE ON-CALL STREET PAVING SPECIALIST

This Amendment to the Agreement for Engineering Services is made and entered into on the date hereinafter stated under City's signature, between the City of Webster City ("City"), Iowa, and Snyder & Associates, Inc. ("Professional").

For work on the On-Call Street Paving Specialist, the parties agree as follows:

1. **Engagement.** The City hereby engages the Professional to perform work necessary to provide all services as described in the Scope of Work in connection with this Amendment to the Contract.

2. **Scope of Work.** The Professional shall perform in a competent and professional manner, the scope of work as set forth in **Exhibit "A"** attached hereto and by reference incorporated herein.

3. **Completion.** The Professional shall commence work immediately upon receipt of a written notice from the City and complete the Scope of Work in an expeditious and professional manner as set forth in **Exhibit "B"** attached hereto and by reference incorporated herein.

4. **Payment.** The prices for work performed by the Professional on this Amendment shall not exceed those prices as set forth in **Exhibit "C"** attached hereto and by reference incorporated herein.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Amendment to the Agreement. All provisions of the Agreement shall remain in full force and effect.

CITY OF WEBSTER CITY, IOWA

____

John Hawkins, Mayor

Dated: March 6, 2023

SNYDER & ASSOCIATES, INC.

____

Mark A. Land, PE, CFM, Vice President

EXHIBIT "A"
SCOPE OF WORK

To accomplish the City's mission of providing quality street, alley, electric, water, wastewater, and storm water services for its customers, it owns and maintains streets and alleys with appurtenant structures, electric facilities with appurtenant structures, water treatment and distribution systems, wastewater collection and treatment systems and storm water collection systems within public rights-of-way.

PHASE 1 – VALUE ENGINEERING OF SANITARY SEWER WASTEWATER TREATMENT PLANT (SSWTP) CONCEPT DESIGN AND PRELIMINARY ENGINEERING

I. GENERAL

The **PROFESSIONAL** shall provide professional services required for the cursory review of an existing Iowa Department of Natural Resources (IDNR) approved wastewater treatment system Facility Plan Engineering Report (Facility Plan).

The work will include:

- An overall review of the existing Facility Plan and its recommendations.
- A review of the recommended treatment processes.
- A review of other recommended improvements to be included with the project.
- A review of project cost estimates included with the Facility Plan.
- A review of project operating costs included with the Facility Plan.
- Provide a written memo with a summary assessment of the selected processes and items for consideration.
- Provide a written memo regarding cost estimates and considerations.
- Provide a written memo regarding operating cost estimates and considerations.

II. MEETINGS

A. A Project Summary Meeting as will be held with the representatives of **CITY** to discuss findings. The meeting may be held in person or virtually at discretion of the group.

PHASE 2 – VALUE ENGINEERING OF SSWTP FINAL DESIGN AND CONSTRUCTION DOCUMENTS

I. ADDITIONAL SERVICES

The **PROFESSIONAL** shall provide additional professional services as determined by the **CITY** if requested. These Value Engineering items shall be identified following completion of Phase 1 and Preliminary Design of the SSWTP is completed.

The Phase 2 Value Engineering Services will be added by amendment to this agreement.

The following items shall be considered additional services and may be requested by the **CITY**. Additional services may be performed on an hourly basis or, should a specific scope of services be defined, a quotation for services may be performed.

1. Detailed review of design.
2. Benefit / cost analysis of SSWTP alternative elements.
3. Field survey.
4. Submittal fees to any and all regulatory agencies.
5. Publication fees.
6. Client requested major revisions.
7. Sanitary gravity sewer capacity study.
8. Lift station capacity and/or condition assessment.
9. Meetings above those listed in the scope of services.
10. Revisions above those listed in the scope of services.
11. New inspections of sanitary sewer infrastructure.
12. Risk analysis.
13. Flow and rainfall monitoring.
14. Design, bidding, and construction services.

All work is on an "as needed" basis and work on each project shall be as directed by the City. Costs for each project assigned shall be negotiated as 'lump sum,' 'not to exceed,' or performed on a 'time and materials' basis, as mutually agreed and detailed in Exhibit "C."

Responsible persons assigned to this project shall be:

City – Biridiana Bishop
Professional – John Haldeman, Jim Lund, Darin Jacobs

EXHIBIT "B"
COMPLETION

Professional shall commence work immediately upon receipt of a written Notice to Proceed from the City and shall complete all phases of the Scope of Work as expeditiously as is consistent with professional skill and care and the orderly progress of the Work in a timely manner.

The anticipated completion for Phase 1 is four weeks after Notice to Proceed.

EXHIBIT "C"
PAYMENT

COMPENSATION

The cost for the work included in the scope of services shall be hourly not to exceed $7,500. Fees will be invoiced and paid on an hourly rate plus expenses basis not to exceed amount and rates will be accrued in accordance with the Professional's 2023 Standard Fee Schedule contained in Exhibit "D" of this Amendment No. 26 to the Agreement for Professional Services.

EXHIBIT "D"

SNYDER & ASSOCIATES

2023

STANDARD FEE SCHEDULE

Billing Classification/Level	Billing Rate
PROFESSIONAL	
Engineer, Landscape Architect, Land Surveyor, GIS, Environmental Scientist Project Manager, Planner, Right-of-Way Agent, Graphic Designer	
Principal II	$245.00/hour
Principal I	$230.00/hour
Senior	$210.00/hour
VIII	$192.00/hour
VII	$182.00/hour
VI	$173.00/hour
V	$161.00/hour
IV	$149.00/hour
III	$137.00/hour
II	$123.00/hour
I	$109.00/hour
TECHNICAL	
CADD, Survey, Construction Observation	
Lead	$146.00/hour
Senior	$140.00/hour
VIII	$130.00/hour
VII	$120.00/hour
VI	$108.00/hour
V	$98.00/hour
IV	$88.00/hour
III	$80.00/hour
II	$73.00/hour
I	$64.00/hour
ADMINISTRATIVE	
II	$75.00/hour
I	$61.00/hour
REIMBURSABLES	
Mileage	current IRS standard rate
Outside Services	As Invoiced

Active Individual NPDES and Operation Permits in Iowa as of 6/1/2023

	Quanity
Activated Sludge	161
Advance Aerated Lagoon	56
Aerated Lagoon	143
Land Application	37
No Treatment	212
Other	270
Oxidation Ditch	18
Primary Treatment	13
Rotating Biological Contactor (RBC)	11
Septic Tank Sand Filter	41
Septic Wetland	3
Sequencing Batch Reactor (SBR)	42
Trickling Filter	53
Waste Stabilization Lagoon	542
TOTAL	**1,602**

Active Individual NPDES and Operation Permits in Iowa as of 6/1/2023

#	Permit #	EPA ID	Expire Date	Facility Name	County	Region	FAC DES BASIN	Design Numbe	Treatment Type	PE	Design BOD	ADW Flow	AWW Flo	pcert Typ	pcert Gra
1	1457102	0064262	10/31/2027	AG PROCESSING INC a COOPERATIVE	Carroll	4	WEST NISHNABOTNA R.	1	ACTIVATED SLUDGE	970	162	0.0367	0.0367		
2	0375102	0077135	7/31/2027	AGRI STAR MEAT AND POULTRY LLC	Allamakee	1	YELLOW R. AND PAINT CR.	2	ACTIVATED SLUDGE	130539	21800		1.45		
3	6800113	0065692	12/31/2027	AJINOMOTO HEALTH & NUTRITION NORTH AMERICA, INC.	Monroe	5	DES MOINES R. BELOW WHITEBREAST CR.	2	ACTIVATED SLUDGE	163132	27243	1.2	1.2		
4	1108001	0024449	6/30/2025	ALTA CITY OF STP	Buena Vista	3	MAPLE R.	2	ACTIVATED SLUDGE	3018	504	0.221	0.566	WW	III
5	5307001	0025895	10/31/2025	ANAMOSA CITY OF STP	Jones	1	WAPSIPINICON R. BELOW ANAMOSA	3	ACTIVATED SLUDGE	9096	1519	0.68	1.25	WW	III
6	2326101	0003620	2/28/2027	ARCHER DANIELS MIDLAND CORN PROCESSING	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	ACTIVATED SLUDGE	1059880	177000		9		
7	7009001	0070998	4/18/2006	ATALISSA CITY OF STP	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	1	ACTIVATED SLUDGE	217	36	0.031	0.04	WW	II
8	0603001	0020796	1/31/2024	ATKINS CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	ACTIVATED SLUDGE	4000	668	0.33	0.94	WW	III
9	3907001	0061468	1/31/2027	BAYARD CITY OF STP	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	ACTIVATED SLUDGE	713	119	0.049	0.07	WW	II
10	7000102	0000205	6/30/2022	BAYER CROPSCIENCE LP	Muscatine	6	MUSCATINE ISLAND	1	ACTIVATED SLUDGE	88204	14730	0.71	0.86		
11	0610001	0065404	12/31/2024	BELLE PLAINE CITY OF STP	Benton	1	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	ACTIVATED SLUDGE	3281	548	0.225	0.609	WW	III
12	4910001	0029009	5/31/2023	BELLEVUE CITY OF STP	Jackson	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	ACTIVATED SLUDGE	4311	720	0.223	0.33	WW	III
13	9905001	0041777	9/30/2026	BELMOND CITY OF STP	Wright	2	IOWA R. ABOVE ALBION	2	ACTIVATED SLUDGE	4216	704	0.298	0.777	WW	III
14	9300104	0077895	3/31/2024	BLENDHOUSE ALLERTON LLC	Wayne	5	MEDICINE AND LOCUST CR.S	1	ACTIVATED SLUDGE	9670	1615	0.078	0.081		
15	0819001	0058076	7/31/2024	BOONE CITY OF STP	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	ACTIVATED SLUDGE	23952	4000	2.1	7	WW	IV
16	7909001	0020958	8/31/2023	BROOKLYN CITY OF STP	Poweshiek	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	ACTIVATED SLUDGE	1976	330	0.2	0.63	WW	II
17	8218001	0020800	4/30/2023	BUFFALO, CITY OF STP	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	ACTIVATED SLUDGE	2898	484	0.18	0.6	WW	III
18	2909001	0043079	1/31/2027	BURLINGTON CITY OF STP	Des Moines	6	FLINT R.	1	ACTIVATED SLUDGE	54491	9100	5.1	10.85	WW	IV
19	8200607	0063339	4/30/2025	CALLISON MOBILE HOME PARK	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	ACTIVATED SLUDGE	61	10.2	0.006	0.0061		
20	3405100	0003557	5/31/2028	CAMBREX CHARLES CITY, INC.	Floyd	2	CEDAR R. ABOVE THE SHELLROCK R.	1	ACTIVATED SLUDGE	12575	2100	0.25	0.25		
21	8200402	0067059	2/28/2027	CAMP ABE LINCOLN	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	ACTIVATED SLUDGE	341	57	0.019	0.021		
22	6800100	0063762	11/30/2022	CARGILL, INC.	Monroe	5	DES MOINES R. BELOW WHITEBREAST CR.	1	ACTIVATED SLUDGE	778443	130000		8		
23	1415001	0021377	8/31/2027	CARROLL, CITY OF STP	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	ACTIVATED SLUDGE	28353	4735	1.6	4.2	WW	IV
24	5318001	0027740	4/30/2028	CASCADE CITY OF STP	Jones	1	MAQUOKETA R.	2	ACTIVATED SLUDGE	4305	719	0.45	1.25	WW	III
25	3914001	0027197	3/8/2006	Casey, City of STP	Guthrie	4	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	ACTIVATED SLUDGE	713	119	0.035	0.075	WW	II
26	5715001	0042641	5/31/2022	CEDAR RAPIDS CITY OF STP	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	ACTIVATED SLUDGE	2431137	406000	43.77	56	WW	IV
27	1811002	0059005	1/31/2026	CHEROKEE CITY OF STP	Cherokee	3	LITTLE SIOUX R.	1	ACTIVATED SLUDGE	200448	35850		2.387	WW	IV
28	2326001	0035947	2/28/2023	CLINTON CITY OF STP	Clinton	6	MISSISSIPPI R. NEAR CLINTON	2	ACTIVATED SLUDGE	111377	18600	5.6	12	WW	IV
29	2326108	0001066	12/31/2025	CLYSAR, LLC	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	ACTIVATED SLUDGE						
30	5600105	0000833	8/31/2026	CONAGRA FOODS PACKAGED FOODS, LLC	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	2	ACTIVATED SLUDGE	257	43		0.02		
31	0220001	0027375	7/31/2027	CORNING CITY OF STP	Adams	4	EAST NODAWAY R.	1	ACTIVATED SLUDGE	4976	831	0.4	0.543	WW	III
32	4515001	0021334	6/30/2026	CRESCO CITY OF STP	Howard	1	UPPER IOWA R.	1	ACTIVATED SLUDGE	7605	1270	0.575	2.436	WW	III
33	2326110	0003522	1/31/2024	CROSS ROADS LAND DEVELOPMENT, LLC	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	ACTIVATED SLUDGE	100	17	0.01	0.01		
34	4622001	0048003	2/28/2027	DAKOTA CITY CITY OF STP	Humboldt	2	EAST FORK DES MOINES R.	2	ACTIVATED SLUDGE	1328	221.75	0.0837	0.3	WW	II
35	8222003	0043052	6/30/2026	DAVENPORT CITY OF STP	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	ACTIVATED SLUDGE	389222	65000	26	26	WW	IV
36	9630001	0035220	10/31/2027	DECORAH CITY OF STP	Winneshiek	1	UPPER IOWA R.	1	ACTIVATED SLUDGE	29341	4900	1.33	4.32	WW	IV
37	2424001	0023302	12/31/2025	DENISON MUNICIPAL UTILITIES-STP	Crawford	4	BOYER R.	2	ACTIVATED SLUDGE	249491	41665	3.67	4.17	WW	IV
38	0915001	0044156	4/30/2027	DENVER CITY OF STP	Bremer	1	CEDAR R. ABOVE THE SHELLROCK R.	2	ACTIVATED SLUDGE	3293	550	0.37	0.65	WW	III
39	7727001	0044130	2/28/2021	DES MOINES METROPOLITAN WRF	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	ACTIVATED SLUDGE	1170958	195550	50	134	WW	IV
40	3126001	0044458	10/31/2024	DUBUQUE CITY OF STP	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	2	ACTIVATED SLUDGE	246707	41200	9.14	13.47	WW	IV
41	7036001	0064891	3/31/2027	DURANT CITY OF STP	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	2	ACTIVATED SLUDGE	2605	435	0.2	0.358	WW	III
42	3130001	0023345	4/30/2025	DYERSVILLE CITY OF STP	Dubuque	1	MAQUOKETA R.	2	ACTIVATED SLUDGE	14371	2400	0.571	1.179	WW	III
43	0721001	0034231	4/30/2023	ELK RUN HEIGHTS CITY OF STP	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	ACTIVATED SLUDGE	4042	675	0.278	0.281	WW	III
44	2223001	0021962	3/31/2027	ELKADER CITY OF STP	Clayton	1	TURKEY R.	2	ACTIVATED SLUDGE	1934	323	0.169	0.733	WW	II
45	4525001	0021075	5/31/2024	ELMA CITY OF STP	Howard	1	WAPSIPINICON R. ABOVE ANAMOSA	1	ACTIVATED SLUDGE	1946	325	0.078	0.4	WW	II
46	5728001	0047988	2/29/2028	ELY CITY OF STP	Linn	1	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	ACTIVATED SLUDGE	4491	750	0.3	0.5	WW	III
47	3133001	0036463	1/31/2026	EPWORTH CITY OF STP	Dubuque	1	MAQUOKETA R.	2	ACTIVATED SLUDGE	4593	767	0.21	0.58	WW	III
48	2326112	0000191	12/31/2022	EQUISTAR CHEMICALS, LP	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	ACTIVATED SLUDGE	10180	1700	1.7			
49	0723001	0022004	9/30/2027	EVANSDALE CITY OF STP	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	ACTIVATED SLUDGE	6641	1109	0.636	1.517	WW	III
50	1025001	0035041	11/30/2026	FAIRBANK CITY OF STP	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	2	ACTIVATED SLUDGE	1826	305	0.062	0.282	WW	II
51	5731001	0030694	7/31/2024	FAIRFAX CITY OF STP	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	ACTIVATED SLUDGE	4192	700	0.4	0.6	WW	III
52	3135001	0044032	4/30/2025	FARLEY CITY OF STP	Dubuque	1	LITTLE MAQUOKETA R.	2	ACTIVATED SLUDGE	2353	393	0.164	0.794	WW	III
53	9433003	0044849	9/30/2025	FORT DODGE CITY OF STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	ACTIVATED SLUDGE	162659	27164	8.4	15	WW	IV
54	5625001	0027219	9/30/2024	FORT MADISON CITY OF STP	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	2	ACTIVATED SLUDGE	59880	10000	2.92	7.29	WW	IV
55	5710801	0076732	9/30/2025	FOUR OAKS GROUP HOME - BERTRAM CAMPUS	Linn	1	CEDAR R. BELOW CEDAR RAPIDS	1	ACTIVATED SLUDGE	72	12	0.006	0.006		
56	0733001	0028177	5/31/2022	GILBERTVILLE CITY OF STP	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	ACTIVATED SLUDGE	731	122	0.12	0.2	WW	II
57	7048101	0003441	10/31/2027	GRAIN PROCESSING CORPORATION	Muscatine	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	ACTIVATED SLUDGE	692216	115600	2.41	4.2		
58	7736001	0035939	1/31/2021	GRIMES, CITY OF STP	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	ACTIVATED SLUDGE	10623	1774	0.58	2.13	WW	III
59	8434001	0021083	6/30/2024	HAWARDEN CITY OF STP	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	ACTIVATED SLUDGE	14497	2421	0.14	0.672	WW	III
60	5432001	0036498	11/30/2025	HEDRICK CITY OF STP	Keokuk	6	SKUNK R. ABOVE THE NORTH SKUNK	2	ACTIVATED SLUDGE	982	164	0.103	0.465	WW	II
61	4800205	0074225	3/31/2023	HERITAGE INN AMANA COLONIES	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	359	60	0.029	0.029		
62	3100302	0063991	3/31/2027	HICKORY ACRES SUBDIVISION	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	2	ACTIVATED SLUDGE	509	85	0.05	0.05		
63	8439001	0036897	6/30/2023	HOSPERS CITY OF STP	Sioux	3	FLOYD R.	3	ACTIVATED SLUDGE	9222	1540	0.18	0.4	WW	III
64	4641001	0047791	11/30/2025	HUMBOLDT CITY OF STP	Humboldt	2	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	ACTIVATED SLUDGE	11198	1870	1.3	1.8	WW	III
65	8538002	0083518	2/28/2027	HUXLEY CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	ACTIVATED SLUDGE	5389	900	0.42	0.85	WW	III
66	5200601	0066303	12/31/2025	IOWA CITY MOBILE HOME PARK	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	365	61	0.026	0.031		
67	5225601	0063274	11/30/2026	IOWA CITY REGENCY MOBILE HOME PARK STP	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	503	84	0.035	0.067		
68	5225002	0070866	4/30/2025	IOWA CITY, CITY OF (SOUTH) STP	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	195557	32658	10.5	24.2	WW	IV
69	3050901	0059765	8/31/2026	IOWA GREAT LAKES SANITARY DISTRICT STP	Dickinson	3	LITTLE SIOUX R.	2	ACTIVATED SLUDGE	74210	12393	2.22	5.17	WW	IV
70	8670101	0000795	12/31/2019	IOWA PREMIUM, LLC	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	ACTIVATED SLUDGE	177605	29660	1.486	1.486		
71	3742001	0021300	10/31/2025	JEFFERSON CITY OF STP	Greene	4	NORTH RACCOON R.	1	ACTIVATED SLUDGE	8982	1500	0.69	2.45	WW	III
72	3126107	0000051	8/31/2019	JOHN DEERE DUBUQUE WORKS	Dubuque	1	LITTLE MAQUOKETA R.	1	ACTIVATED SLUDGE	3593	600	0.2	0.2		
73	5640001	0042609	8/31/2023	KEOKUK CITY OF STP	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	ACTIVATED SLUDGE	71257	11900	3.43	5	WW	IV

74	9400100	0000302	7/31/2024	KOCH FERTILIZER FT. DODGE, LLC	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	ACTIVATED SLUDGE	156	26	0.01	0.01		
75	3045001	0036919	3/31/2028	LAKE PARK CITY OF STP	Dickinson	3	LITTLE SIOUX R.	2	ACTIVATED SLUDGE	1826	305	0.114	0.73	WW	II
76	5200316	0074284	10/31/2024	LAKE RIDGE	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	1461	244	0.08	0.13		
77	5200304	0061514	8/1/2006	LAKEVIEW KNOLLS	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	359	60	0.04	0.0424		
78	0345001	0024597	3/31/2022	LANSING CITY OF STP	Allamakee	1	YELLOW R. AND PAINT CR.	2	ACTIVATED SLUDGE	1447	241.6	0.224	0.407	WW	II
79	7540001	0036536	11/30/2023	LE MARS CITY OF STP	Plymouth	3	FLOYD R.	3	ACTIVATED SLUDGE	114970	19200	3.14	3.59	WW	IV
80	1700100	0001945	1/31/2027	LEHIGH CEMENT COMPANY LLC	Cerro Gordo	2	WINNEBAGO R.	1	ACTIVATED SLUDGE	38	6.3	0.006	0.006		
81	4500802	0052031	4/30/2020	LIME SPRINGS BEEF, LLC (NOW UPPER IOWA BEEF, LLC)	Howard	1	UPPER IOWA R.	1	ACTIVATED SLUDGE	7533	1258	0.044	0.044		
82	5748001	0025909	4/30/2025	LISBON CITY OF STP	Linn	1	CEDAR R. BELOW CEDAR RAPIDS	2	ACTIVATED SLUDGE	3725	622	0.31	0.4	WW	III
83	5240001	0060330	5/31/2028	LONE TREE CITY OF STP (SOUTH)	Johnson	6	IOWA R. BELOW NORTH LIBERTY	2	ACTIVATED SLUDGE	2156	360	0.176	0.822	WW	III
84	8251001	0022292	7/31/2022	LONG GROVE CITY OF STP	Scott	6	WAPSIPINICON R. BELOW ANAMOSA	2	ACTIVATED SLUDGE	1455	243	0.1467	0.2303	WW	II
85	0848001	0028207	8/31/2026	MADRID CITY OF STP	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	2	ACTIVATED SLUDGE	5174	864	0.449	0.99	WW	III
86	2839001	0021032	6/30/2026	MANCHESTER CITY OF STP	Delaware	1	MAQUOKETA R.	3	ACTIVATED SLUDGE	15000	2505	0.424	0.986	WW	III
87	3621100	0063568	9/30/2025	MANILDRA MILLING CORPORATION	Fremont	4	NISHNABOTNA R.	1	ACTIVATED SLUDGE	11497	1920	0.301	0.602		
88	6727001	0021288	9/30/2022	MAPLETON CITY OF STP	Monona	4	MAPLE R.	1	ACTIVATED SLUDGE	1198	200	0.1	0.3	WW	II
89	7000601	0066338	3/31/2028	MAPLEWOOD ESTATES	Muscatine	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	ACTIVATED SLUDGE	485	81	0.027	0.04		
90	4950001	0024481	5/31/2025	MAQUOKETA CITY OF STP	Jackson	1	MAQUOKETA R.	1	ACTIVATED SLUDGE	14970	2500	1.03	1.3	WW	III
91	2256001	0059463	2/28/2027	MARQUETTE CITY OF STP	Clayton	1	YELLOW R. AND PAINT CR.	1	ACTIVATED SLUDGE	1904	445	0.126	0.156	WW	III
92	1750001	0057169	7/31/2026	MASON CITY, CITY OF STP	Cerro Gordo	2	WINNEBAGO R.	2	ACTIVATED SLUDGE	169072	28235	6.8	14.9	WW	IV
93	8748102	0075647	5/31/2022	MICHAEL FOODS, INC.	Taylor	4	HUNDRED AND TWO	1	ACTIVATED SLUDGE	44910	7500	0.25	0.25		
94	4953001	0028606	8/31/2022	MILES CITY OF STP	Jackson	1	MISSISSIPPI R. NEAR SABULA	1	ACTIVATED SLUDGE	677	113	0.045	0.053	WW	II
95	5200605	0064874	8/31/2023	MODERN MANOR MOBILE HOME COURT	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	719	120	0.075	0.1		
96	2264001	0036927	12/31/2021	MONONA CITY OF STP	Clayton	1	TURKEY R.	1	ACTIVATED SLUDGE	2179	364	0.1341	0.312	WW	III
97	5650001	0030848	12/31/2025	MONTROSE CITY OF STP	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	ACTIVATED SLUDGE	1018	170		0.1	WW	II
98	5758001	0023710	6/30/2025	MOUNT VERNON CITY OF STP	Linn	1	CEDAR R. BELOW CEDAR RAPIDS	1	ACTIVATED SLUDGE	10299	1720	0.656	1.436	WW	III
99	8222603	0068012	3/31/2024	MT. JOY MOBILE HOME PARK	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	ACTIVATED SLUDGE	169	28.2	0.0094	0.0094		
100	7048001	0023434	3/31/2025	MUSCATINE CITY OF STP	Muscatine	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	ACTIVATED SLUDGE	128743	21500	5.15	10.3	WW	IV
101	1967001	0024503	9/30/2027	NASHUA CITY OF STP	Chickasaw	1	CEDAR R. ABOVE THE SHELLROCK R.	2	ACTIVATED SLUDGE	2114	353	0.122	0.23	WW	III
102	7853001	0021041	10/31/2023	NEOLA CITY OF STP	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	2	ACTIVATED SLUDGE	1269	212	0.074	0.112	WW	II
103	5059002	0027723	7/31/2025	NEWTON CITY OF STP	Jasper	5	SKUNK R. ABOVE THE NORTH SKUNK	1	ACTIVATED SLUDGE	35808	5980	2.937	9.202	WW	IV
104	3423001	0032778	6/30/2025	NORA SPRINGS CITY OF STP	Floyd	2	SHELLROCK R.	2	ACTIVATED SLUDGE	2760	461	0.182	0.599	WW	III
105	9855001	0032395	4/30/2023	NORTHWOOD CITY OF STP	Worth	2	SHELLROCK R.	2	ACTIVATED SLUDGE	7114	1188	0.378	0.829	WW	III
106	2900301	0075469	1/31/2026	OAK HILLS SUBDIVISION-STP	Des Moines	6	FLINT R.	1	ACTIVATED SLUDGE	600	100	0.059	0.059		
107	0858001	0041904	8/31/2025	OGDEN CITY OF STP	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	3	ACTIVATED SLUDGE	2287	382	0.247	1.218	WW	III
108	6273002	0038521	3/31/2026	OSKALOOSA CITY OF STP (SOUTHWEST)	Mahaska	5	DES MOINES R. BELOW WHITEBREAST CR.	1	ACTIVATED SLUDGE	9802	1637	0.745	2.25	WW	III
109	9083001	0058611	6/30/2023	OTTUMWA CITY OF STP	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	ACTIVATED SLUDGE	69539	11613	6	10	WW	IV
110	6368006	0043869	3/31/2027	PELLA CITY OF STP	Marion	5	DES MOINES R. BELOW WHITEBREAST CR.	2	ACTIVATED SLUDGE	14904	2489	2.304	4.31	WW	III
111	2561001	0032379	10/4/2010	PERRY CITY OF STP	Dallas	5	NORTH RACCOON R.	1	ACTIVATED SLUDGE	20958	3500	1.5	2.9	WW	IV
112	7900209	0078361	8/31/2024	PILOT TRAVEL CENTER #495	Poweshiek	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	ACTIVATED SLUDGE	150	25	0.0075	0.0075		
113	7633001	0035173	2/28/2026	POCAHONTAS CITY OF STP	Pocahontas	3	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	ACTIVATED SLUDGE	3084	515	0.35	0.92	WW	III
114	0375001	0058904	4/30/2024	POSTVILLE CITY OF STP	Allamakee	1	YELLOW R. AND PAINT CR.	2	ACTIVATED SLUDGE	5772	964	0.382	0.867	WW	III
115	2200100	0003808	6/30/2024	PRAIRIE FARMS DAIRY	Clayton	1	TURKEY R.	2	ACTIVATED SLUDGE	19760	3300	0.22	0.69		
116	0965001	0044440	6/30/2024	READLYN, CITY OF STP	Bremer	1	WAPSIPINICON R. ABOVE ANAMOSA	2	ACTIVATED SLUDGE	1174	196	0.085	0.25	WW	II
117	7800301	0071269	11/30/2024	RISEN SON CHRISTIAN VILLAGE	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	2	ACTIVATED SLUDGE	820	137	0.05	0.05		
118	3100200	0052748	4/30/2022	RON WHITE HWY 20 TRUCK PLAZA	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	ACTIVATED SLUDGE	81	13.5	0.004	0.0045		
119	5640101	0000256	6/30/2023	ROQUETTE AMERICA, INC.	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	ACTIVATED SLUDGE	446263	74526	4.89	4.89		
120	9000602	0069663	2/29/2024	ROYCE VALLEY VILLAGE LLC	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	ACTIVATED SLUDGE	359	60	0.036	0.036		
121	7774001	0063355	4/30/2027	RUNNELLS CITY OF STP	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	ACTIVATED SLUDGE	719	120	0.0519	0.07	WW	II
122	0670001	0033332	5/31/2006	SHELLSBURG CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	ACTIVATED SLUDGE	3479	581	0.32	0.48	WW	III
123	5600104	0074951	3/31/2019	SIEMENS GAMESA RENEWABLE ENERGY, INC.	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	2	ACTIVATED SLUDGE	225	37.5	0.02	0.02		
124	8486002	0033731	2/28/2026	SIOUX CENTER CITY OF STP	Sioux	3	FLOYD R.	2	ACTIVATED SLUDGE	28144	4700	1.31	2.21	WW	IV
125	9778001	0043095	11/30/2025	SIOUX CITY, CITY OF STP	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	ACTIVATED SLUDGE	522204	87208	15.98	17.6	WW	IV
126	5502600	0065269	9/23/2006	SOUTH OAK ESTATES MHP (NOW BURR OAK MOTEL)	Kossuth	2	EAST FORK DES MOINES R.	1	ACTIVATED SLUDGE	175	29	0.015	0.015		
127	8500302	0068276	6/30/2027	SOUTH SQUAW VALLEY ASSOCIATION	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	2	ACTIVATED SLUDGE	174	29	0.014	0.043		
128	5500301	0068284	6/30/2026	SOUTHDALE ADDITION	Kossuth	2	EAST FORK DES MOINES R.	2	ACTIVATED SLUDGE	216	36	0.006	0.006		
129	4982001	0050741	6/30/2023	SPRAGUEVILLE CITY OF STP	Jackson	1	MAQUOKETA R.	1	ACTIVATED SLUDGE	219	37	0.013	0.013	WW	II
130	4289001	0033324	12/31/2024	STEAMBOAT ROCK CITY OF STP	Hardin	2	IOWA R. ABOVE ALBION	1	ACTIVATED SLUDGE	635	106	0.049	0.049	WW	II
131	1178001	0032484	6/30/2024	STORM LAKE CITY OF STP	Buena Vista	3	NORTH RACCOON R.	2	ACTIVATED SLUDGE	38802	6480	2.3	6.45	WW	IV
132	3973001	0041858	1/31/2025	STUART CITY OF STP	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	2	ACTIVATED SLUDGE	2960	507	0.25	0.73	WW	III
133	5076001	0041963	2/28/2026	SULLY CITY OF STP	Jasper	5	NORTH SKUNK R.	1	ACTIVATED SLUDGE	970	162	0.095	0.99	WW	II
134	3100612	0073334	10/31/2026	SUPER 20 MOBILE HOME PARK	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	ACTIVATED SLUDGE	225	37.5	0.019	0.019		
135	5285001	0033774	3/31/2026	SWISHER CITY OF STP	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	ACTIVATED SLUDGE	1934	323	0.17	0.32	WW	II
136	8670002	0043681	11/30/2023	TAMA CITY OF STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	ACTIVATED SLUDGE	4970	830	0.5	2	WW	III
137	8670100	0000841	11/30/2027	TAMA PAPERBOARD, LLC	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	ACTIVATED SLUDGE	10441	1775	0.27	0.27		
138	1479101	0053056	12/31/2023	TEMPLETON RYE DISTILLERY	Carroll	4	EAST NISHNABOTNA R.	1	ACTIVATED SLUDGE	67665	11300	0.028			
139	5288001	0036617	10/31/2025	TIFFIN CITY OF STP	Johnson	6	IOWA R. BELOW NORTH LIBERTY	2	ACTIVATED SLUDGE	11826	1975	0.62	0.975	WW	III
140	2300300	0069116	1/14/2007	TIMBER CREEK ESTATES HOMEOWNER'S ASSOCIATION, INC	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	1	ACTIVATED SLUDGE	102	17	0.0097	0.01		
141	8676001	0033103	4/30/2028	TOLEDO CITY OF STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	ACTIVATED SLUDGE	3257	544	0.35	1.1	WW	III
142	5800100	0003361	6/30/2027	TYSON FRESH MEATS, INC. - COLUMBUS JUNCTION	Louisa	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	186826	31200		1.8		
143	2500100	0002089	12/31/2024	TYSON FRESH MEATS, INC. - PERRY	Dallas	5	NORTH RACCOON R.	2	ACTIVATED SLUDGE	80479	13440	1.4	1.4		
144	1178105	0064998	6/30/2025	TYSON FRESH MEATS, INC. - STORM LAKE	Buena Vista	3	NORTH RACCOON R.	1	ACTIVATED SLUDGE	221557	37000		1.85		
145	0680001	0059072	2/28/2026	URBANA CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	ACTIVATED SLUDGE	3772	630	0.28	0.48	WW	III
146	0685001	0033341	4/30/2028	VAN HORNE CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	ACTIVATED SLUDGE	1222	204	0.12	0.387	WW	II
147	4875001	0058190	1/31/2023	VICTOR CITY OF STP	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	ACTIVATED SLUDGE	1497	250	0.09	0.2	WW	II
148	0688001	0035891	6/30/2025	VINTON CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	ACTIVATED SLUDGE	12982	2168	1.48	1.79	WW	III
149	7085001	0061891	11/30/2024	WALCOTT CITY OF STP (SOUTH)	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	2	ACTIVATED SLUDGE	5880	982	0.488	1.308	WW	III
150	0690001	0062545	4/30/2024	WALFORD CITY OF STP	Benton	1	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	ACTIVATED SLUDGE	3725	622	0.28	0.43	WW	III

151	0790001	0042650	5/31/2026	WATERLOO CITY OF STP	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	ACTIVATED SLUDGE	526946	88000	18	34.8	WW	IV
152	9276001	0032301	6/30/2026	WELLMAN CITY OF STP	Washington	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	1772	296	0.275	0.45	WW	II
153	2985001	0033669	7/31/2026	WEST BURLINGTON CITY OF STP	Des Moines	6	FLINT R.	3	ACTIVATED SLUDGE	6126	1023	0.63	1.85	WW	III
154	8200906	0066974	11/30/2024	WEST LAKE PARK	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	ACTIVATED SLUDGE	210	35	0.01	0.02		
155	7073001	0031691	1/31/2024	WEST LIBERTY CITY OF STP	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	1	ACTIVATED SLUDGE	24108	4011	1.38	2.21	WW	IV
156	4802102	0000744	3/31/2025	WHIRLPOOL CORP - AMANA APPLIANCE DIVISION	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	ACTIVATED SLUDGE	4102	685	0.2	0.3		
157	8222604	0064432	7/31/2026	WILD ROSE MOBILE HOME PARK	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	ACTIVATED SLUDGE	76	13	0.006	0.0075		
158	4884001	0033880	4/30/2024	WILLIAMSBURG CITY OF STP	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	3503	585	0.44	0.585	WW	III
159	7078001	0032921	11/30/2024	WILTON CITY OF STP	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	2	ACTIVATED SLUDGE	8611	1438	0.656	0.78	WW	III
160	5800601	0052740	7/31/2027	WOODLAND MOBILE HOME PARK	Louisa	6	IOWA R. BELOW NORTH LIBERTY	1	ACTIVATED SLUDGE	239	40	0.015	0.015		
161	3189001	0058548	8/31/2027	WORTHINGTON CITY OF STP	Dubuque	1	MAQUOKETA R.	1	ACTIVATED SLUDGE	563	94	0.05	0.165	WW	II
162	1103001	0034312	3/31/2025	ALBERT CITY, CITY OF STP	Buena Vista	3	NORTH RACCOON R.	2	ADVANCED AERATED	1317	220	0.058	0.38	WW	II
163	1503001	0024520	6/30/2027	ANITA CITY OF STP	Cass	4	EAST NISHNABOTNA R.	2	ADVANCED AERATED	3521	588	0.105	0.415	WW	II
164	2613001	0047929	4/30/2027	BLOOMFIELD CITY OF STP (MAIN)	Davis	6	FOX AND WYACONDA R.S	2	ADVANCED AERATED	5599	935	0.319	0.692	WW	II
165	1011001	0028185	10/31/2026	BRANDON, CITY OF STP	Buchanan	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	ADVANCED AERATED	329	55	0.016	0.158	WW	II
166	9615001	0023515	4/30/2025	CALMAR CITY OF STP	Winneshiek	1	TURKEY R.	2	ADVANCED AERATED	1193	199.2	0.114	0.372	WW	II
167	5720001	0027979	2/28/2027	CENTRAL CITY CITY OF STP	Linn	1	WAPSIPINICON R. ABOVE ANAMOSA	2	ADVANCED AERATED	2049	342.2	0.125	0.161	WW	II
168	9909001	0030945	1/31/2028	CLARION, CITY OF STP	Wright	2	BOONE R.	2	ADVANCED AERATED	8790	1468	0.686	1.21	WW	II
169	2809002	0023604	9/30/2024	COLESBURG CITY OF STP (SOUTHEAST)	Delaware	1	TURKEY R.	2	ADVANCED AERATED	952	159	0.041	0.241	WW	II
170	2520001	0035319	9/30/2026	DALLAS CENTER CITY OF STP	Dallas	5	NORTH RACCOON R.	2	ADVANCED AERATED	1988	332	0.27	1.2	WW	II
171	6900900	0066036	5/31/2026	DNR VIKING LAKE STATE PARK	Montgomery	4	NODAWAY R.	2	ADVANCED AERATED	78	13	0.0002	0.0126		
172	5620001	0035335	5/31/2024	DONNELLSON CITY OF STP	Lee	6	DES MOINES R. BELOW WHITEBREAST CR.	1	ADVANCED AERATED	1916	320	0.145	0.228	WW	II
173	8627001	0020745	11/30/2027	DYSART CITY OF STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	ADVANCED AERATED	1976	330	0.23	0.83	WW	II
174	2820001	0024490	6/30/2022	EDGEWOOD CITY OF STP	Delaware	1	MAQUOKETA R.	2	ADVANCED AERATED	2335	390	0.13	0.314	WW	II
175	2115001	0028916	12/31/2026	EVERLY CITY OF STP	Clay	3	LITTLE SIOUX R.	2	ADVANCED AERATED	671	112	0.065	0.785	WW	II
176	8531001	0025968	5/31/2025	GILBERT, CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	2	ADVANCED AERATED	2653	443	0.141	0.428	WW	II
177	1438001	0024571	5/31/2027	GLIDDEN CITY OF STP	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	2	ADVANCED AERATED	3593	600	0.12	0.3	WW	II
178	1253001	0035432	6/30/2026	GREENE CITY OF STP	Butler	2	SHELLROCK R.	2	ADVANCED AERATED	1695	283.1	0.068	0.334	WW	II
179	0330001	0070564	7/31/2027	HARPERS FERRY, CITY OF STP	Allamakee	1	YELLOW R. AND PAINT CR.	2	ADVANCED AERATED	1150	192	0.045	0.07	WW	II
180	9128001	0066761	11/30/2026	HARTFORD CITY OF STP	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	2	ADVANCED AERATED	1533	256	0.075	0.26	WW	II
181	8444001	0020991	5/31/2024	HULL CITY OF STP	Sioux	3	ROCK R.	2	ADVANCED AERATED	4491	750	0.4	0.7	WW	II
182	5440001	0035998	11/30/2023	KEOTA CITY OF STP	Keokuk	6	SKUNK R. BELOW THE NORTH SKUNK	2	ADVANCED AERATED	1102	184	0.102	0.608	WW	II
183	0640001	0025984	3/31/2024	KEYSTONE CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	3	ADVANCED AERATED	1084	181	0.078	0.428	WW	II
184	7537001	0023400	5/31/2024	KINGSLEY CITY OF STP	Plymouth	3	WEST FORK LITTLE SIOUX R.	2	ADVANCED AERATED	1569	262	0.131	0.3	WW	II
185	2432001	0020818	8/31/2024	KIRON CITY OF STP	Crawford	4	BOYER R.	2	ADVANCED AERATED	359	60	0.028	0.098	WW	II
186	8127001	0041998	4/30/2026	LAKE VIEW CITY OF STP	Sac	3	NORTH RACCOON R.	2	ADVANCED AERATED	1952	326	0.23	0.46	WW	II
187	8200605	0064718	5/31/2026	LAKESIDE MANOR MOBILE HOME COMMUNITY	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	ADVANCED AERATED	360	60.2	0.017	0.037		
188	8748001	0027995	7/31/2025	LENOX CITY OF STP	Taylor	4	HUNDRED AND TWO	2	ADVANCED AERATED	2084	348	0.152	0.624	WW	II
189	1656001	0047899	4/30/2022	LOWDEN CITY OF STP	Cedar	6	WAPSIPINICON R. BELOW ANAMOSA	2	ADVANCED AERATED	575	96	0.085	0.201	WW	II
190	1558001	0048348	2/28/2027	MASSENA CITY OF STP	Cass	4	NODAWAY R.	2	ADVANCED AERATED	1048	175	0.041	0.18	WW	II
191	8557001	0041793	5/31/2026	MAXWELL CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	2	ADVANCED AERATED	1497	250	0.16	0.45	WW	II
192	1667001	0022314	3/31/2028	MECHANICSVILLE CITY OF STP	Cedar	6	WAPSIPINICON R. BELOW ANAMOSA	2	ADVANCED AERATED	1335	223	0.131	0.33	WW	II
193	6352001	0047783	9/30/2027	MELCHER-DALLAS CITY OF STP	Marion	5	DES MOINES R. BELOW WHITEBREAST CR.	2	ADVANCED AERATED	2521	421	0.2	0.95	WW	II
194	5054001	0041947	8/31/2025	MONROE CITY OF STP (EAST)	Jasper	5	SKUNK R. ABOVE THE NORTH SKUNK	2	ADVANCED AERATED	2323	388	0.148	0.554	WW	II
195	7950001	0036935	8/31/2026	MONTEZUMA CITY OF STP	Poweshiek	5	NORTH SKUNK R.	2	ADVANCED AERATED	5389	900	0.3	1.25	WW	II
196	4458001	0025941	10/31/2026	NEW LONDON CITY OF STP	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	2	ADVANCED AERATED	2240	374	0.244	0.885	WW	II
197	6264001	0032417	6/30/2025	NEW SHARON CITY OF STP	Mahaska	5	NORTH SKUNK R.	2	ADVANCED AERATED	1317	220	0.175	0.681	WW	II
198	0653001	0043664	5/31/2028	NEWHALL CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	ADVANCED AERATED	1126	188	0.083	0.619	WW	II
199	8200902	0062561	4/30/2023	PARK VIEW SANITARY DIST. STP	Scott	6	WAPSIPINICON R. BELOW ANAMOSA	2	ADVANCED AERATED	5090	850	0.492	0.5	WW	II
200	7568001	0036030	11/30/2025	REMSEN CITY OF STP	Plymouth	3	FLOYD R.	2	ADVANCED AERATED	1737	290	0.213	0.444	WW	II
201	8570001	0032425	12/31/2025	ROLAND CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	2	ADVANCED AERATED	1299	217	0.167	0.556	WW	II
202	7465001	0032441	5/31/2028	RUTHVEN CITY OF STP	Palo Alto	3	LITTLE SIOUX R.	2	ADVANCED AERATED	868	145	0.12	0.35	WW	II
203	2446001	0036170	12/31/2026	SCHLESWIG CITY OF STP	Crawford	4	SOLDIER R.	2	ADVANCED AERATED	1653	276	0.13	0.234	WW	II
204	3759001	0032409	9/30/2025	SCRANTON CITY OF STP	Greene	4	NORTH RACCOON R.	3	ADVANCED AERATED	1383	231	0.102	0.29	WW	II
205	9780001	0032361	2/29/2024	SLOAN CITY OF STP	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	2	ADVANCED AERATED	952	159	0.096	0.285	WW	II
206	1681001	0033758	9/30/2026	STANWOOD CITY OF STP	Cedar	6	CEDAR R. BELOW CEDAR RAPIDS	2	ADVANCED AERATED	1103	184.2	0.074	0.597	WW	II
207	2279001	0042757	11/30/2024	STRAWBERRY POINT CITY OF STP	Clayton	1	MAQUOKETA R.	2	ADVANCED AERATED	1820	304	0.146	0.58	WW	II
208	5200303	0069108	11/30/2026	TIMBER TRAILS ESTATES HOMEOWNER'S ASSOCIATION	Johnson	6	IOWA R. BELOW NORTH LIBERTY	2	ADVANCED AERATED	122	20.4	0.012	0.012		
209	1689001	0032727	5/31/2028	TIPTON CITY OF STP	Cedar	6	CEDAR R. BELOW CEDAR RAPIDS	2	ADVANCED AERATED	4964	829	0.39	1.45	WW	II
210	6985001	0032549	3/31/2028	VILLISCA CITY OF STP	Montgomery	4	NODAWAY R.	2	ADVANCED AERATED	3162	528	0.303	0.774	WW	II
211	5792001	0059081	7/31/2027	WALKER CITY OF STP	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	ADVANCED AERATED	874	146	0.055	0.222	WW	II
212	3890001	0042803	3/31/2028	WELLSBURG CITY OF STP	Grundy	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	ADVANCED AERATED	719	120	0.04	0.24	WW	II
213	1694001	0032859	11/30/2027	WEST BRANCH CITY OF STP	Cedar	6	CEDAR R. BELOW CEDAR RAPIDS	2	ADVANCED AERATED	3749	626	0.334	0.924	WW	II
214	5691001	0043109	7/31/2026	WEST POINT CITY OF STP	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	2	ADVANCED AERATED	1593	266	0.153	0.314	WW	II
215	1093001	0032808	5/31/2025	WINTHROP CITY OF STP	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	2	ADVANCED AERATED	1713	286	0.1	0.46	WW	II
216	2576001	0057517	6/30/2025	WOODWARD CITY OF STP	Dallas	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	2	ADVANCED AERATED	2084	348	0.186	0.692	WW	II
217	5392001	0032646	10/31/2026	WYOMING, CITY OF STP	Jones	1	MAQUOKETA R.	2	ADVANCED AERATED	521	87	0.104	0.434	WW	II
218	4201001	0035297	6/30/2025	ACKLEY CITY OF STP	Hardin	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	AERATED LAGOON	2198	367	0.218	0.53	WL	IL
219	9003001	0057754	8/26/2006	AGENCY CITY OF STP	Wapello	6	SKUNK R. BELOW THE NORTH SKUNK	1	AERATED LAGOON	784	131	0.0555	0.1885	WL	IL
220	6803001	0036871	4/30/2026	ALBIA CITY OF STP (NORTH)	Monroe	5	DES MOINES R. BELOW WHITEBREAST CR.	1	AERATED LAGOON	4353	727	0.348	0.818	WL	IL
221	6803003	0036889	4/30/2026	ALBIA CITY OF STP (WEST)	Monroe	5	DES MOINES R. BELOW WHITEBREAST CR.	1	AERATED LAGOON	1246	208	0.154	0.268	WL	IL
222	6403001	0034321	11/30/2024	ALBION CITY OF STP	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	611	102	0.078	0.25	WL	IL
223	9303002	0054046	8/31/2026	ALLERTON CITY OF STP (SOUTH)	Wayne	5	MEDICINE AND LOCUST CR.S	1	AERATED LAGOON	5988	1000	0.14	0.21	WW	I
224	1207001	0035050	12/31/2023	APLINGTON CITY OF STP	Butler	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	AERATED LAGOON	1198	200	0.166	0.35	WL	IL
225	3203001	0028517	5/31/2027	ARMSTRONG CITY OF STP	Emmet	3	EAST FORK DES MOINES R.	1	AERATED LAGOON	1269	212	0.125	0.325	WL	IL
226	6203001	0035424	3/31/2024	BEACON CITY OF STP	Mahaska	5	DES MOINES R. BELOW WHITEBREAST CR.	1	AERATED LAGOON	575	96	0.065	0.189	WL	IL
227	8909001	0023426	7/27/2002	BIRMINGHAM CITY OF STP	Van Buren	6	SKUNK R. BELOW THE NORTH SKUNK	1	AERATED LAGOON	479	80	0.057	0.19	WL	IL

228	0607001	0030660	11/30/2021	BLAIRSTOWN CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	AERATED LAGOON	1413	236	0.1	0.62	WL	IL
229	8215001	0028975	8/31/2020	BLUE GRASS CITY OF STP	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	AERATED LAGOON	3192	533	0.26	0.454	WL	IL
230	8409001	0042838	1/31/2025	BOYDEN CITY OF STP	Sioux	3	FLOYD R.	1	AERATED LAGOON	10329	1725	0.194	0.35	WW	I
231	9209001	0047911	7/31/2024	BRIGHTON CITY OF STP	Washington	6	SKUNK R. BELOW THE NORTH SKUNK	1	AERATED LAGOON	940	157	0.0925	0.231	WL	IL
232	8509001	0022101	3/31/2028	CAMBRIDGE CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	2	AERATED LAGOON	1449	242	0.095	0.46	WL	IL
233	7700901	0063215	7/31/2024	CAMP DODGE	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	AERATED LAGOON	2216	370	0.218	0.396		
234	9000501	0064700	10/31/2024	CARDINAL SCHOOL STP	Wapello	6	SKUNK R. BELOW THE NORTH SKUNK	1	AERATED LAGOON	269	45	0.018	0.018		
235	9113001	0024554	3/31/2024	CARLISLE CITY OF STP	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	AERATED LAGOON	5090	850	0.54	1.48	WW	I
236	5718001	0021067	7/31/2022	CENTER POINT CITY OF STP (NORTH)	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	AERATED LAGOON	2006	335	0.144	0.2	WL	IL
237	5718002	0074420	7/31/2022	CENTER POINT, CITY OF STP (SOUTH)	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	AERATED LAGOON	1988	332	0.178	0.195	WL	IL
238	5600501	0069426	6/30/2025	CENTRAL LEE COMMUNITY SCHOOLS	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	AERATED LAGOON	290	48	0.02	0.02		
239	8609001	0071552	1/31/2026	CHELSEA CITY OF STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	449	75	0.042	0.043	WL	IL
240	0410001	0070734	10/31/2023	CINCINNATI CITY OF STP	Appanoose	5	CHARITON R.	1	AERATED LAGOON	629	105		0.061	WL	IL
241	3317001	0024465	8/31/2026	CLERMONT CITY OF STP	Fayette	1	TURKEY R.	1	AERATED LAGOON	796	133	0.035	0.084	WL	IL
242	5815001	0023523	4/30/2023	COLUMBUS JUNCTION CITY OF STP	Louisa	6	IOWA R. BELOW NORTH LIBERTY	1	AERATED LAGOON	2874	480	0.33	0.72	WL	IL
243	4109001	0021351	6/30/2028	CORWITH CITY OF STP	Hancock	2	BOONE R.	1	AERATED LAGOON	497	83	0.05	0.2	WL	IL
244	9334004	0049573	6/30/2026	CORYDON CITY OF STP	Wayne	5	CHARITON R.	1	AERATED LAGOON	2335	390	0.359	0.936	WL	IL
245	7700605	0068004	8/31/2025	COUNTRY LIVING MOBILE HOME PARK	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	AERATED LAGOON	375	46.7	0.028	0.038		
246	2715001	0060232	4/30/2025	DAVIS CITY, CITY OF STP (SIRWA)	Decatur	5	THOMPSON R.	1	AERATED LAGOON	399	66.7	0.026	0.09	WL	IL
247	9900124	0077411	7/31/2023	DAYBREAK FOODS INC - VINCENT FARM - LAOP	Wright	2	BOONE R.	1	AERATED LAGOON	20958	3500		0.065		
248	5417001	0070742	4/30/2024	DELTA CITY OF STP	Keokuk	6	NORTH SKUNK R.	1	AERATED LAGOON	461	77	0.028	0.063	WL	IL
249	2800903	0066044	11/6/2006	DNR BACKBONE STATE PARK (LOWER AREA)	Delaware	1	MAQUOKETA R.	1	AERATED LAGOON	90	15.1	0.0092	0.0093		
250	3500901	0067385	4/30/2025	DNR BEEDS LAKE STATE PARK	Franklin	2	WEST FORK CEDAR R.	1	AERATED LAGOON	126	21	0.0235	0.033		
251	5200900	0072079	12/31/2024	DNR LAKE MACBRIDE STATE PARK-CAMPGROUND	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	AERATED LAGOON	75	13	0.0078	0.0082		
252	8700902	0075515	11/30/2027	DNR LAKE OF THREE FIRES STATE PARK	Taylor	4	HUNDRED AND TWO	2	AERATED LAGOON	180	30	0.0088	0.0126		
253	2600902	0076694	1/31/2022	DNR LAKE WAPELLO STATE PARK	Davis	6	DES MOINES R. BELOW WHITEBREAST CR.	1	AERATED LAGOON	80	13.3	0.0103	0.0122		
254	0800903	0077127	4/26/2014	DNR LEDGES STATE PARK	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	AERATED LAGOON	52	9	0.0059	0.0059		
255	2200902	0075400	7/31/2025	DNR PIKES PEAK STATE PARK-STP	Clayton	1	YELLOW R. AND PAINT CR.	1	AERATED LAGOON	56	9	0.0053	0.0056		
256	3900900	0075272	8/31/2023	DNR SPRINGBROOK STATE PARK-EDUCATION CENTER	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	AERATED LAGOON	48	8	0.0047	0.0048		
257	9921001	0042811	6/30/2024	DOWS CITY OF STP	Wright	2	IOWA R. ABOVE ALBION	1	AERATED LAGOON	1377	230	0.109	0.267	WL	IL
258	1240001	0033316	12/31/2022	DUMONT CITY OF STP	Butler	2	WEST FORK CEDAR R.	1	AERATED LAGOON	719	120	0.13	0.423	WL	IL
259	6115001	0027421	8/31/2024	EARLHAM CITY OF STP	Madison	5	MIDDLE AND SOUTH RACCOON R.S	1	AERATED LAGOON	2036	340	0.19	0.85	WL	IL
260	8320001	0025364	7/31/2026	EARLING CITY OF STP	Shelby	4	PIGEON AND MOSQUITO CR.S	1	AERATED LAGOON	533	89	0.0067	0.183	WL	IL
261	2900605	0068241	5/31/2023	ECHO VALLEY MOBILE HOME PARK NO. 2	Des Moines	6	FLINT R.	1	AERATED LAGOON	102	17	0.01	0.015		
262	2900601	0067725	3/24/2003	ECHO VALLEY MOBILE HOME PARK NO.1	Des Moines	6	FLINT R.	1	AERATED LAGOON	72	12	0.0056	0.0069		
263	9049001	0020770	3/31/2027	EDDYVILLE, CITY OF STP	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	AERATED LAGOON	4491	750	0.217	0.626	WL	IL
264	3338001	0024414	3/31/2027	ELGIN CITY OF STP	Fayette	1	TURKEY R.	2	AERATED LAGOON	736	123	0.058	0.364	WL	IL
265	7730001	0021326	9/30/2019	ELKHART CITY OF STP	Polk	5	SKUNK R. ABOVE THE NORTH SKUNK	1	AERATED LAGOON	389	65	0.052	0.127	WL	IL
266	1320001	0028967	2/28/2023	FARNHAMVILLE CITY OF STP	Calhoun	3	NORTH RACCOON R.	1	AERATED LAGOON	467	78	0.0461	0.053	WL	IL
267	3342001	0027456	8/31/2024	FAYETTE CITY OF STP	Fayette	1	TURKEY R.	2	AERATED LAGOON	1850	309	0.093	0.438	WL	IL
268	3414001	0028894	10/31/2024	FLOYD CITY OF STP	Floyd	2	CEDAR R. ABOVE THE SHELLROCK R.	1	AERATED LAGOON	719	120	0.025	0.07	WL	IL
269	0135001	0041840	6/30/2023	FONTANELLE CITY OF STP	Adair	4	NODAWAY R.	1	AERATED LAGOON	784	131	0.057	0.398	WL	IL
270	1940001	0028991	1/26/2008	FREDERICKSBURG CITY OF STP	Chickasaw	1	WAPSIPINICON R. ABOVE ANAMOSA	1	AERATED LAGOON	20120	3360	0.35	0.9	WW	I
271	5200117	0052710	7/31/2027	FRYTOWN PROPERTIES, LLC	Johnson	6	IOWA R. BELOW NORTH LIBERTY	2	AERATED LAGOON	18096	3022	0.025	0.025		
272	2234001	0026697	4/2/2008	GARNAVILLO CITY OF STP	Clayton	1	TURKEY R.	1	AERATED LAGOON	1030	172	0.072	0.194	WL	IL
273	5200201	0074985	3/31/2024	GATEWAY COMMERCIAL CONDOMINIUM ASSOCIATION	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	AERATED LAGOON	734	122.5	0.072	0.098		
274	9700101	0004413	1/31/2023	GELITA USA, INC.	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	AERATED LAGOON	93600	15600		5.4		
275	6436001	0029033	11/30/2027	GILMAN CITY OF STP	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	731	122	0.0484	0.4484	WL	IL
276	8640001	0025330	12/31/2022	GLADBROOK CITY OF STP	Tama	5	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	AERATED LAGOON	1287	215	0.114	0.28	WL	IL
277	9436001	0020966	6/30/2024	GOWRIE MUNICIPAL UTILITIES	Webster	2	NORTH RACCOON R.	1	AERATED LAGOON	1389	232	0.09	0.72	WL	IL
278	3100605	0063240	12/2/2006	GRANADA GARDENS MOBILE HOME PARK	Dubuque	1	LITTLE MAQUOKETA R.	1	AERATED LAGOON	90	15	0.0083	0.0166		
279	5842001	0062901	2/28/2025	GRANDVIEW CITY OF STP	Louisa	6	IOWA R. BELOW NORTH LIBERTY	2	AERATED LAGOON	766	128	0.073	0.166	WL	IL
280	3900103	0075361	9/30/2024	GUTHRIE CENTER EGG FARM	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	AERATED LAGOON	22335	3730	0.12	0.12		
281	3900106	0053064	10/28/2024	GUTHRIE CENTER EGG FARM - LAOP	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	AERATED LAGOON	22325	3730	0.12	0.12		
282	2242001	0022284	4/30/2026	GUTTENBERG CITY OF STP	Clayton	1	MISSISSIPPI R. ABOVE THE TURKEY R.	1	AERATED LAGOON	2749	459	0.3	0.8	WL	IL
283	5221002	0052894	8/31/2025	HILLS, CITY OF WWTF	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	AERATED LAGOON	1964	328	0.161	0.472	WL	IL
284	0737002	0027243	7/31/2023	HUDSON CITY OF STP	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	AERATED LAGOON	5988	1000	0.22	0.6	WW	I
285	9348001	0043150	12/31/2027	HUMESTON CITY OF STP	Wayne	5	CHARITON R.	1	AERATED LAGOON	1048	175	0.11	0.27	WL	IL
286	1600113	0071056	3/31/2027	HWH CORPORATION	Cedar	6	CEDAR R. BELOW CEDAR RAPIDS	1	AERATED LAGOON	60	10	0.0041	0.0041		
287	9300601	0083691	5/31/2027	INDIAN RIDGE HOMEOWNERS ASSOCIATION	Wayne	5	CHARITON R.	1	AERATED LAGOON	80	13.4	0.0074	0.0074		
288	4800904	0072206	9/30/2024	IOWA COUNTY SANITARY LANDFILL	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	AERATED LAGOON	419	70	0.006	0.026		
289	7800905	0068918	4/30/2024	IOWA DOT REST AREA #29 & #30 I80 UNDERWOOD	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	AERATED LAGOON	485	81	0.0098	0.0162		
290	0732001	0026506	12/31/2021	JANESVILLE CITY OF STP	Black Hawk	1	CEDAR R. ABOVE THE SHELLROCK R.	2	AERATED LAGOON	1599	267	0.1	0.136	WL	IL
291	1044002	0075302	5/31/2024	JESUP, CITY OF STP (SOUTH)	Buchanan	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	AERATED LAGOON	4970	830	0.32	2.25	WL	IL
292	5200116	0052476	1/31/2028	KALONA CREAMERY, LLC	Johnson	6	IOWA R. BELOW NORTH LIBERTY	2	AERATED LAGOON	2958	494		0.031		
293	0543001	0025372	3/31/2028	KIMBALLTON CITY OF STP	Audubon	4	EAST NISHNABOTNA R.	1	AERATED LAGOON	994	166	0.05	0.05	WL	IL
294	4155001	0038466	8/31/2022	KLEMME CITY OF STP	Hancock	2	IOWA R. ABOVE ALBION	2	AERATED LAGOON	521	87	0.077	0.64	WL	IL
295	7900714	0067458	4/30/2026	KWIK STAR #303	Poweshiek	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	425	71	0.012	0.012		
296	4840001	0058521	8/31/2023	LADORA CITY OF STP	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	359	60	0.035	0.201	WL	IL
297	9545001	0027448	5/31/2027	LAKE MILLS CITY OF STP	Winnebago	2	WINNEBAGO R.	1	AERATED LAGOON	17964	3000	0.501	0.75	WW	I
298	5200327	0081426	3/31/2026	LAKEWOODS DEVELOPMENT SUBDIVISION/BOWERSOX	Johnson	6	CEDAR R. BELOW CEDAR RAPIDS	1	AERATED LAGOON	581	97	0.0353	0.0441		
299	6452001	0072214	8/31/2024	LAUREL, CITY OF STP	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	754	126	0.072	0.073	WL	IL
300	4535001	0043494	9/30/2023	LIME SPRINGS CITY OF STP	Howard	1	UPPER IOWA R.	1	AERATED LAGOON	644	107.5	0.057	0.28	WL	IL
301	6858001	0027430	7/31/2023	LOVILIA CITY OF STP	Monroe	5	DES MOINES R. BELOW WHITEBREAST CR.	1	AERATED LAGOON	653	109	0.064	0.182	WL	IL
302	5200906	0073580	4/30/2027	MACBRIDE SANITARY SEWER DISTRICT	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	519	86.7	0.0408	0.051	WL	IL
303	4843001	0047937	6/30/2026	MARENGO CITY OF STP	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	2898	484	0.242	0.549	WL	IL
304	2948001	0025917	2/29/2024	MEDIAPOLIS CITY OF STP	Des Moines	6	FLINT R.	1	AERATED LAGOON	2371	396	0.2	0.34	WL	IL

305	6471001	0036552	5/31/2026	MELBOURNE CITY OF STP	Marshall	5	NORTH SKUNK R.	2	AERATED LAGOON	1587	265	0.167	0.627	WL	IL
306	2952001	0025381	10/31/2026	MIDDLETOWN CITY OF STP	Des Moines	6	FLINT R.	1	AERATED LAGOON	587	98	0.057	0.367	WL	IL
307	9155001	0030511	5/31/2024	MILO CITY OF STP	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	AERATED LAGOON	1437	240	0.11	0.19	WL	IL
308	4349001	0023507	6/30/2007	MONDAMIN CITY OF STP	Harrison	4	SOLDIER R.	1	AERATED LAGOON	635	106	0.048	0.766	WL	IL
309	8666001	0058700	11/30/2025	MONTOUR CITY OF STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	377	63	0.044	0.083	WL	IL
310	7038901	0073890	4/30/2022	MONTPELIER SANITARY DISTRICT, VILLAGE OF	Muscatine	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	AERATED LAGOON	898	150	0.0882	0.0882	WL	IL
311	0467001	0056693	4/30/2025	MORAVIA CITY OF STP	Appanoose	5	DES MOINES R. BELOW WHITEBREAST CR.	1	AERATED LAGOON	856	143	0.08	0.204	WL	IL
312	5857001	0059587	6/30/2023	MORNING SUN CITY OF STP	Louisa	6	IOWA R. BELOW NORTH LIBERTY	1	AERATED LAGOON	1733	289.4	0.151	0.452	WL	IL
313	4453002	0070009	8/31/2023	MOUNT PLEASANT CITY OF STP (EAST)	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	1	AERATED LAGOON	3563	595	0.35	0.7	WL	IL
314	9753001	0042943	10/31/2024	MOVILLE CITY OF STP	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	AERATED LAGOON	2246	375	0.31	0.37	WL	IL
315	1271001	0056880	4/30/2023	NEW HARTFORD CITY OF STP	Butler	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	AERATED LAGOON	1563	261	0.11	0.21	WL	IL
316	3165001	0027391	4/30/2027	NEW VIENNA CITY OF STP	Dubuque	1	MAQUOKETA R.	2	AERATED LAGOON	437	73	0.034	0.084	WL	IL
317	9159901	0058891	8/31/2023	NEW VIRGINIA SANITARY DISTRICT-STP	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	AERATED LAGOON	898	150	0.0682	0.198	WL	IL
318	2500103	0000299	9/30/2025	NORTHERN NATURAL GAS CO. REDFIELD STATION	Dallas	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	2	AERATED LAGOON	14162	2365	1	1.18		
319	5500300	0065242	5/31/2028	OAK LAKE MAINTENANCE, INC.	Kossuth	2	EAST FORK DES MOINES R.	2	AERATED LAGOON	144	24	0.03	0.058		
320	8474001	0032751	1/26/2009	ORANGE CITY CITY OF STP	Sioux	3	FLOYD R.	1	AERATED LAGOON	14431	2410	1.075	1.9	WW	I
321	9677003	0042781	9/3/2006	OSSIAN CITY OF STP	Winneshiek	1	TURKEY R.	1	AERATED LAGOON	946	158	0.083	0.293	WL	IL
322	5161001	0057819	1/14/2007	PACKWOOD CITY OF STP	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	1	AERATED LAGOON	329	55	0.041	0.095	WL	IL
323	3971001	0057045	3/31/2022	PANORA CITY OF STP	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	AERATED LAGOON	6174	1031	0.1414	0.51	WW	I
324	7139001	0032352	3/31/2027	PAULLINA CITY OF STP	O'Brien	3	LITTLE SIOUX R.	1	AERATED LAGOON	5018	838	0.1134	0.527	WW	I
325	1759001	0033383	7/31/2023	PLYMOUTH CITY OF STP	Cerro Gordo	2	SHELLROCK R.	2	AERATED LAGOON	479	80	0.072	0.237	WL	IL
326	4965001	0047864	4/30/2022	PRESTON CITY OF STP	Jackson	1	MAQUOKETA R.	2	AERATED LAGOON	1725	288	0.106	0.186	WL	IL
327	8273001	0033227	3/31/2027	PRINCETON CITY OF STP	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	AERATED LAGOON	1629	272	0.086	0.392	WL	IL
328	4700105	0076813	6/30/2022	QUAD COUNTY CORN PROCESSORS	Ida	3	MAPLE R.	1	AERATED LAGOON	8683	1450	0.027	0.028		
329	1074001	0057011	2/29/2024	QUASQUETON CITY OF STP	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	1	AERATED LAGOON	1108	185	0.062	0.08	WL	IL
330	4800705	0066265	12/31/2022	RAMADA INN	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	AERATED LAGOON	1569	262	0.046	0.046		
331	9500102	0076252	8/31/2018	REMBRANDT ENTERPRISES, INC. (NOW IOWA CAGE-FREE,	Winnebago	2	WINNEBAGO R.	2	AERATED LAGOON	2994	5000	0.15			
332	1100116	0052991	7/31/2023	REMBRANDT ENTERPRISES, INC. - LAOP	Buena Vista	3	NORTH RACCOON R.	1	AERATED LAGOON	29162	4870	0.08	0.09		
333	5939001	0043176	12/31/2024	RUSSELL CITY OF STP	Lucas	5	CHARITON R.	1	AERATED LAGOON	671	112	0.088	0.31	WL	IL
334	3600201	0077461	12/31/2025	SAPP BROS.TRAVEL CENTER	Fremont	4	KEG AND WAUBONSIE CR.S	1	AERATED LAGOON	1359	227		0.099		
335	9400900	0059200	2/28/2026	SAVAGE SANITARY DISTRICT STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	AERATED LAGOON	599	100	0.05	0.09	WL	IL
336	3570001	0036005	1/31/2025	SHEFFIELD CITY OF STP	Franklin	2	WEST FORK CEDAR R.	2	AERATED LAGOON	2467	412	0.175	0.888	WL	IL
337	1286001	0033359	1/31/2027	SHELL ROCK CITY OF STP	Butler	2	SHELLROCK R.	1	AERATED LAGOON	1832	306	0.15	0.282	WL	IL
338	5475002	0036595	6/30/2020	SIGOURNEY CITY OF STP (EAST)	Keokuk	6	NORTH SKUNK R.	1	AERATED LAGOON	3617	604	0.35	0.95	WL	IL
339	1175001	0042951	3/31/2024	SIOUX RAPIDS CITY OF STP	Buena Vista	3	LITTLE SIOUX R.	1	AERATED LAGOON	964	161	0.075	0.15	WL	IL
340	8580001	0033740	5/31/2020	SLATER CITY OF STP	Story	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	AERATED LAGOON	2323	388	0.29	0.92	WL	IL
341	6673001	0033723	4/30/2024	ST. ANSGAR CITY OF STP	Mitchell	2	CEDAR R. ABOVE THE SHELLROCK R.	1	AERATED LAGOON	1605	268	0.103	0.18	WL	IL
342	6484001	0041807	2/29/2024	STATE CENTER CITY OF STP	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	2006	335	0.185	0.465	WL	IL
343	7714601	0068071	3/31/2027	SUNNYBROOK MHC LLC (HAVENPARK MANAGEMENT)	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	AERATED LAGOON	365	61	0.008	0.04		
344	5200602	0067911	12/31/2025	SUNRISE MOBILE HOME	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	AERATED LAGOON	336	56	0.033	0.038		
345	6400601	0068659	11/30/2026	TIMBER WOLF VALLEY MHP	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	314	52.4	0.02	0.02		
346	8681001	0035033	1/31/2023	TRAER MUNICIPAL UTILITIES	Tama	5	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	AERATED LAGOON	2000	334	0.2	0.608	WL	IL
347	7866002	0039977	9/30/2022	TREYNOR CITY OF STP (NORTHWEST)	Pottawattamie	4	WEST NISHNABOTNA R.	1	AERATED LAGOON	2126	355	0.158	0.206	WL	IL
348	0975001	0033120	4/30/2026	TRIPOLI CITY OF STP	Bremer	1	WAPSIPINICON R. ABOVE ANAMOSA	2	AERATED LAGOON	1934	323	0.214	0.83	WL	IL
349	6167001	0040991	8/31/2023	TRURO CITY OF STP	Madison	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	AERATED LAGOON	898	150	0.067	0.111	WL	IL
350	9600500	0067423	2/28/2027	TURKEY VALLEY COMMUNITY SCHOOL	Winneshiek	1	TURKEY R.	1	AERATED LAGOON	287	48	0.024	0.024		
351	7869001	0036986	12/31/2022	UNDERWOOD CITY OF STP	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	AERATED LAGOON	1485	248	0.113	0.164	WL	IL
352	9400103	0062359	12/31/2015	UNITED STATES GYPSUM COMPANY	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	AERATED LAGOON	90	15	0.009	0.013		
353	3300100	0000809	1/31/2026	VAN ELDEREN INC.	Fayette	1	MAQUOKETA R.	1	AERATED LAGOON	41198	6880	0.301	0.602		
354	7872001	0042986	4/29/2006	WALNUT CITY OF STP	Pottawattamie	4	WEST NISHNABOTNA R.	1	AERATED LAGOON	1407	235	0.108	0.234	WL	IL
355	5879001	0047961	4/30/2028	WAPELLO CITY OF STP	Louisa	6	IOWA R. BELOW NORTH LIBERTY	2	AERATED LAGOON	2976	497	0.18	1.06	WL	IL
356	3375001	0071048	4/30/2026	WAUCOMA CITY OF STP	Fayette	1	TURKEY R.	2	AERATED LAGOON	347	58	0.0308	0.0308	WL	IL
357	4490001	0047953	7/31/2027	WAYLAND, CITY OF STP	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	1	AERATED LAGOON	1168	195	0.138	0.31	WL	IL
358	4880901	0077372	12/31/2026	WEST/HIGH AMANA SANITARY DISTRICT	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	AERATED LAGOON	269	45	0.0265	0.1489	WL	IL
359	5493001	0032468	4/29/2006	WHAT CHEER CITY OF STP	Keokuk	6	NORTH SKUNK R.	1	AERATED LAGOON	898	150	0.086	0.32	WL	IL
360	4493001	0033367	2/28/2022	WINFIELD CITY OF STP	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	1	AERATED LAGOON	1353	226	0.135	0.33	WL	IL
361	8466785	0084166	7/31/2023	360 Cattle Company, Inc.	Sioux	3	FLOYD R.	1	LAND APPLICATION						
362	8503006	0053469	2/23/2027	AMES MUNICIPAL ELECTRIC SYSTEM - SETTLING POND LAOP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	LAND APPLICATION				0.0915		
363	1300103	0073512	10/20/2024	AMPC, INC. dba ESSENTIA PROTEINS SOLUTIONS - LAOP	Calhoun	3	NORTH RACCOON R.	1	LAND APPLICATION		1000	0.031	0.031		
364	7500114	0080942	2/29/2028	ANTHONY TRUCKING, INC. - LAOP	Plymouth	3	FLOYD R.	1	LAND APPLICATION						
365	7165102	0053204	2/10/2025	ASSOCIATED MILK PRODUCERS, INC. LAOP	O'Brien	3	FLOYD R.	1	LAND APPLICATION						
366	6061430	0084204	5/31/2024	AVACH HOLDINGS LLC	Lyon	3	BIG SIOUX R. ABOVE THE ROCK	1	LAND APPLICATION						
367	4760840	0079049	10/31/2024	B&D Dairy	Ida	3	LITTLE SIOUX R.	1	LAND APPLICATION						
368	1100109	0081256	2/29/2028	BINDER LIVESTOCK TRAILER WASHOUT - LAOP	Buena Vista	3	NORTH RACCOON R.	1	LAND APPLICATION						
369	2424101	0072915	12/31/2024	BOYER VALLEY COMPANY - LAOP	Crawford	4	BOYER R.	1	LAND APPLICATION						
370	8400117	0080641	5/31/2028	CENTER FRESH EGG FARM - LAOP	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	LAND APPLICATION		3340	0.05			
371	9900123	0082783	9/30/2025	CENTRUM VALLEY FARMS, LLP - LAOP	Wright	2	BOONE R.	1	LAND APPLICATION						
372	9000105	0077062	9/30/2026	CHAMNESS TECHNOLOGY, INC. - LAOP	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	LAND APPLICATION						
373	6058490	0084239	7/31/2024	Damon Bahnson Combined Operation	Lyon	3	BIG SIOUX R. ABOVE THE ROCK	1	LAND APPLICATION						
374	9766009	0084182	10/31/2023	Dan Burkhart Feedlot Site #2	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	LAND APPLICATION						
375	7500123	0053180	9/17/2024	DERBY TRUCKING - LAOP	Plymouth	3	FLOYD R.	1	LAND APPLICATION	54	9		0.0037		
376	0400914	0075949	3/5/2011	DNR HONEY CREEK STATE PARK-(IA.OP.PERMIT)	Appanoose	5	CHARITON R.	1	LAND APPLICATION	150	25	0.011	0.011		
377	9768119	0052174	12/31/2026	Fleck Farms Feedlot	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	LAND APPLICATION						
378	7900104	0083577	5/31/2024	FREMONT FARMS OF IOWA L.L.P. - LAOP	Poweshiek	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	LAND APPLICATION		3500		0.06		
379	4100203	0053115	3/11/2024	HAWKEYE PRIDE EGG FARMS, L.L.P. - LAOP	Hancock	2	BOONE R.	1	LAND APPLICATION						
380	0800108	0082732	8/31/2025	ISU BIOCENTURY RESEARCH FARM - LAOP	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	LAND APPLICATION						
381	6066585	0053042	6/30/2024	Jon Van Ginkel Feedlot	Lyon	3	ROCK R.	1	LAND APPLICATION						

382	9400121	0053000	7/31/2024	KOCH FERTILIZER FORT DODGE NITROGEN PLANT - LAOP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	LAND APPLICATION						
383	8456553	0084263	10/31/2023	Myron Gradert Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	LAND APPLICATION						
384	6058902	0084093	12/31/2023	Norm Cleveringa Feedlot	Lyon	3	ROCK R.	1	LAND APPLICATION						
385	8400100	0004235	5/19/2025	PERDUE PREMIUM MEAT CO. AKA SIOUX PREME PACKING CO. -	Sioux	3	FLOYD R.	3	LAND APPLICATION	44994	7514		0.396		
386	5475100	0073474	8/31/2023	RESPONSIBLE TRANSPORTATION - LAOP	Keokuk	6	NORTH SKUNK R.	1	LAND APPLICATION	509	85		0.03		
387	5640109	0084336	8/31/2023	ROQUETTE AMERICA INC. - LAOP	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	LAND APPLICATION						
388	0100104	0052306	10/28/2024	Rose Acre Farms - Livestock Truck Wash - LAOP	Adair	4	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	LAND APPLICATION						
389	7000113	0052387	10/31/2025	ROWELL CHEMICAL CORPORATION	Muscatine	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	LAND APPLICATION						
390	8460416	0084069	7/31/2023	Royal Ridge Dairy	Sioux	3	ROCK R.	1	LAND APPLICATION						
391	1800100	0004634	9/30/2026	SIMONSEN RENDERING, LLC - LAOP	Cherokee	3	LITTLE SIOUX R.	1	LAND APPLICATION						
392	0100103	0052242	9/30/2025	STUART EGG FARM - LAOP	Adair	4	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	LAND APPLICATION						
393	7200802	0079596	2/28/2025	SUNRISE FARMS, INC. - LAOP	Osceola	3	LITTLE SIOUX R.	1	LAND APPLICATION						
394	6200110	0079553	2/19/2025	TASSEL RIDGE WINERY - LAOP	Mahaska	5	DES MOINES R. BELOW WHITEBREAST CR.	1	LAND APPLICATION	389	65	0.0008	0.0016		
395	8457166	0052395	7/31/2026	Van Driessen Farms, Inc.	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	LAND APPLICATION						
396	7500108	0076988	7/31/2026	WEINRICH TRUCK LINE, INC. - LAOP	Plymouth	3	FLOYD R.	1	LAND APPLICATION				0.008		
397	6100801	0072681	7/31/2024	WINTERSET EGG FARM - LAOP	Madison	5	NORTH RACCOON R.	1	LAND APPLICATION						
398	3126122	0079146	2/28/2025	1840, LLC	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
399	3126114	0063860	3/31/2028	A.Y. MCDONALD MFG. CO.	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
400	6600110	0080896	10/31/2022	ABSOLUTE ENERGY	Mitchell	2	CEDAR R. ABOVE THE SHELLROCK R.	1	NO TREATMENT						
401	2326120	0082279	3/31/2025	ADM BIOPROCESSING	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	NO TREATMENT						
402	2326119	0080543	7/31/2024	ADM CLINTON COGENERATION PLANT	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	NO TREATMENT						
403	0790123	0078484	1/31/2024	ADVANCED HEAT TREAT CORPORATION	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
404	0790119	0075451	7/31/2024	ADVANCED HEAT TREAT CORPORATION - MIDPORT	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
405	4000111	0053034	2/28/2026	AG PARTNERS, LLC	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	NO TREATMENT						
406	9926101	0059901	1/31/2017	AG PROCESSING INC.	Wright	2	BOONE R.	1	NO TREATMENT						
407	9926102	0074128	5/26/2010	AG PROCESSING INC. - ENERGY CENTER	Wright	2	BOONE R.	1	NO TREATMENT		20	5	5		
408	9700105	0058815	5/31/2022	AG PROCESSING INC. - SERGEANT BLUFF	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	2	NO TREATMENT						
409	7170100	0063771	3/30/2005	AG PROCESSING INC. - SHELDON	O'Brien	3	FLOYD R.	1	NO TREATMENT						
410	5500113	0081116	12/31/2026	AG PROCESSING, INC. - ALGONA	Kossuth	2	EAST FORK DES MOINES R.	1	NO TREATMENT						
411	0790118	0072419	4/30/2024	ALLEN MEMORIAL HOSPITAL	Black Hawk	1	CEDAR R. ABOVE THE SHELLROCK R.	1	NO TREATMENT						
412	3126120	0077151	10/31/2024	ALLIANT ENERGY DATA CENTER	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
413	7707002	0078603	7/31/2024	ALTOONA, CITY OF MS4	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
414	4700109	0082121	12/29/2013	AMERICAN NATURAL PROCESSORS, INC.	Ida	3	MAPLE R.	1	NO TREATMENT						
415	8503003	0078204	3/31/2024	AMES, CITY OF MS4	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	NO TREATMENT						
416	9433112	0071366	3/31/2028	AML RIVERSIDE	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
417	7709008	0078611	8/31/2024	ANKENY, CITY OF MS4	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
418	7727135	0072958	5/31/2026	ARCHER DANIELS MIDLAND COMPANY	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
419	7727012	0052975	4/30/2024	ARMY POST ROAD AQUIFER STORAGE & RECOVERY FACILITY	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
420	3030102	0053081	2/24/2026	ARNOLDS PARK 2019 PROMENADE BEAUTIFICATION PROJECT	Dickinson	3	LITTLE SIOUX R.	1	NO TREATMENT						
421	3102002	0078905	1/31/2025	ASBURY, CITY OF MS4	Dubuque	1	LITTLE MAQUOKETA R.	1	NO TREATMENT						
422	7165101	0081965	5/31/2023	ASSOCIATED MILK PRODUCERS, INC. - SANBORN	O'Brien	3	FLOYD R.	1	NO TREATMENT						
423	3126501	0081809	2/29/2020	AUDUBON ELEMENTARY SCHOOL	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
424	0398100	0003751	11/30/2024	AVEKA NUTRA PROCESSING	Allamakee	1	UPPER IOWA R.	1	NO TREATMENT						
425	5625101	0003514	8/31/2024	AXALTA COATING SYSTEMS, LLC - FORT MADISON PLANT	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	NO TREATMENT						
426	2300111	0081345	4/21/2013	BENEFICIAL TECHNOLOGIES, LLC	Clinton	6	MAQUOKETA R.	1	NO TREATMENT						
427	8209000	0078191	1/31/2024	BETTENDORF, CITY OF MS4	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	NO TREATMENT						
428	2900112	0078123	1/31/2025	BIG RIVER RESOURCES WEST BURLINGTON, LLC	Des Moines	6	SKUNK R. BELOW THE NORTH SKUNK	1	NO TREATMENT						
429	2800906	0081302	10/31/2025	BIG RIVER UNITED ENERGY, LLC	Delaware	1	MAQUOKETA R.	1	NO TREATMENT						
430	8600102	0078158	10/31/2023	BITUMINOUS MATERIALS & SUPPLY	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	NO TREATMENT						
431	7727134	0073172	1/31/2023	BITUMINOUS MATERIALS AND SUPPLY, LP	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
432	7717002	0078786	9/30/2024	BONDURANT, CITY OF MS4	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
433	9778501	0052953	6/30/2023	BRIAR CLIFF UNIVERSITY	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
434	6400113	0081434	10/31/2021	BRUIN MANUFACTURING CO., INC.	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	NO TREATMENT						
435	7720100	0001228	5/31/2025	BUCKEYE TERMINALS, LLC - DES MOINES TERMINAL	Polk	5	NORTH RACCOON R.	1	NO TREATMENT						
436	8218002	0078760	8/31/2024	BUFFALO, CITY OF MS4	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	NO TREATMENT						
437	5715100	0000647	9/30/2025	CARGILL INCORPORATED	Linn	1	CEDAR R. BELOW CEDAR RAPIDS	1	NO TREATMENT						
438	7812000	0078891	6/30/2026	CARTER LAKE, CITY OF MS4	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	NO TREATMENT						
439	0709003	0078263	4/30/2024	CEDAR FALLS, CITY OF MS4	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
440	5715007	0053447	2/29/2028	CEDAR LAKE DEWATERING	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
441	5715146	0052651	5/31/2022	CEDAR RAPIDS COUNTRY CLUB	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
442	5715141	0077381	8/31/2023	CEDAR RAPIDS FRANKLIN MIDDLE SCHOOL	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
443	5715142	0077968	8/31/2024	CEDAR RAPIDS MCKINLEY MIDDLE SCHOOL	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
444	5715143	0078344	3/31/2024	CEDAR RAPIDS WILSON MIDDLE SCHOOL	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
445	5715005	0075566	1/31/2026	CEDAR RAPIDS, CITY OF MS4	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
446	9778121	0030881	12/31/2023	CENTRAL BANK	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
447	7720002	0078867	8/31/2024	CLIVE, CITY OF MS4	Polk	5	NORTH RACCOON R.	1	NO TREATMENT						
448	2909100	0000787	3/27/2011	CNH AMERICA, LLC	Des Moines	6	FLINT R.	1	NO TREATMENT						
449	3126202	0052864	8/31/2022	Convivium Urban Farmstead	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
450	5208002	0078646	8/31/2024	CORALVILLE, CITY OF MS4	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
451	2100100	0004570	7/31/2022	CORN BELT POWER COOPERATIVE-WISDOM STATION	Clay	3	LITTLE SIOUX R.	1	NO TREATMENT						
452	9937101	0079545	8/31/2027	CORN, LP	Wright	2	BOONE R.	1	NO TREATMENT						
453	7820003	0078271	12/31/2022	COUNCIL BLUFFS, CITY OF MS4	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	NO TREATMENT						
454	0790122	0077437	12/31/2026	COVENANT MEDICAL CENTER	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
455	5600100	0003387	4/30/2024	CRYOTECH DEICING TECHNOLOGY	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	NO TREATMENT						
456	2326104	0000914	1/31/2022	DARLING INGREDIENTS INC.	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	NO TREATMENT						
457	8222005	0078808	6/30/2024	DAVENPORT, CITY OF MS4	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	NO TREATMENT						
458	9630101	0003794	5/31/2012	DECO PRODUCTS CO.	Winneshiek	1	UPPER IOWA R.	1	NO TREATMENT						

459	7727137	0076511	5/31/2027	DES MOINES - NAHAS AQUATIC CENTER	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
460	7727008	0075931	4/30/2027	DES MOINES INTERNATIONAL AIRPORT	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
461	7727007	0075540	6/30/2024	DES MOINES, CITY OF MS4	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
462	2200900	0054828	2/28/2025	DNR BIG SPRING TROUT HATCHERY	Clayton	1	TURKEY R.	1	NO TREATMENT						
463	9700800	0063622	9/30/2027	DNR BROWN'S LAKE	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
464	3000122	0053439	1/31/2026	DRY DOCK DEVELOPMENT	Dickinson	3	LITTLE SIOUX R.	1	NO TREATMENT						
465	3126901	0081876	2/29/2024	DUBUQUE COUNTY COURTHOUSE	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
466	3126902	0081884	6/30/2024	DUBUQUE COUNTY SHERIFF OFFICE	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
467	3100804	0082031	4/30/2024	DUBUQUE RESIDENTIAL FACILITY	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
468	3126004	0078671	10/31/2024	DUBUQUE, CITY OF MS4	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
469	9400114	0070661	11/30/2022	ELANCO FORT DODGE	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
470	8230004	0084468	7/31/2024	ELDRIDGE, CITY OF MS4	Scott	6	WAPSIPINICON R. BELOW ANAMOSA	1	NO TREATMENT						
471	1500106	0052718	5/31/2022	ELITE OCTANE, LLC	Cass	4	EAST NISHNABOTNA R.	1	NO TREATMENT						
472	0721002	0078280	4/30/2025	ELK RUN HEIGHTS, CITY OF MS4	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
473	5728002	0084476	6/30/2024	ELY, CITY OF MS4	Linn	1	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	NO TREATMENT						
474	8222108	0060305	4/30/2022	ESCP CORPORATION	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	NO TREATMENT						
475	0723002	0078654	1/31/2026	EVANSDALE, CITY OF MS4	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
476	5715121	0003093	11/30/2020	EVERGREEN PACKAGING LLC	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT			0.134	0.134		
477	6469102	0000230	9/30/2024	FISHER CONTROLS INTERNATIONAL LLC (MAIN OFFICE)	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	NO TREATMENT						
478	4200121	0078841	2/28/2015	FLINT HILLS RESOURCES IOWA FALLS (NOW POET BIOREFINING	Hardin	2	IOWA R. ABOVE ALBION	1	NO TREATMENT						
479	3900903	0081311	1/14/2013	FLINT HILLS RESOURCES MENLO (NOW POET BIOREFINING -	Guthrie	4	NORTH RACCOON R.	1	NO TREATMENT						
480	3000121	0053423	8/16/2023	GARLOCK SLOUGH CONSTRUCTION	Dickinson	3	LITTLE SIOUX R.	1	NO TREATMENT						
481	7700121	0052209	10/31/2024	GENERAL MILLS AVON PLANT	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
482	3126121	0077399	5/31/2026	GRAND RIVER CENTER	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
483	7700119	0077941	4/30/2022	GREATER DES MOINES ENERGY CENTER	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
484	3600102	0082210	4/30/2026	GREEN PLAINS SHENANDOAH, LLC	Fremont	4	EAST NISHNABOTNA R.	1	NO TREATMENT						
485	3000105	0081281	10/31/2023	GREEN PLAINS SUPERIOR, LLC	Dickinson	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	NO TREATMENT						
486	7736002	0078883	12/31/2024	GRIMES, CITY OF MS4	Polk	5	NORTH RACCOON R.	1	NO TREATMENT						
487	2326115	0068101	5/31/2026	HAWKINS - CAMANCHE	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	NO TREATMENT						
488	5735000	0078743	1/31/2026	HIAWATHA, CITY OF MS4	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
489	7820113	0077178	1/31/2028	HIGHLINE WARREN, LLC-STORM WATER DISCHARGE	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	NO TREATMENT						
490	1900107	0081981	12/17/2013	HOMELAND ENERGY SOLUTIONS, LLC	Chickasaw	1	WAPSIPINICON R. ABOVE ANAMOSA	1	NO TREATMENT						
491	1100107	0076767	11/30/2024	HUBBARD FEEDS INC.	Buena Vista	3	NORTH RACCOON R.	1	NO TREATMENT						
492	0737003	0084484	5/31/2024	HUDSON, CITY OF MS4	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
493	3100202	0081612	8/31/2023	ICE HARBOR CENTER	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
494	5225110	0079235	8/31/2025	IIHR OAKDALE ANNEX	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
495	3126123	0081591	4/30/2025	INTERSTATE BUILDING, LLLP	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
496	5225005	0078298	5/31/2024	IOWA CITY, CITY OF MS4	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
497	3000119	0053380	2/7/2025	IOWA DOT HWY 71 CONSTRUCTION	Dickinson	3	LITTLE SIOUX R.	1	NO TREATMENT						
498	7727805	0052438	1/31/2026	IOWA LUTHERAN HOSPITAL	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
499	7727806	0052446	1/31/2026	IOWA METHODIST MEDICAL CENTER	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
500	8503004	0078174	1/31/2024	IOWA STATE UNIVERSITY MS4	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	NO TREATMENT						
501	9778151	0079944	12/31/2025	JEBRO, INCORPORATED	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
502	0790107	0059439	1/31/2027	JOHN DEERE ENGINE WORKS	Black Hawk	1	CEDAR R. ABOVE THE SHELLROCK R.	1	NO TREATMENT						
503	0790116	0069485	11/30/2023	JOHN DEERE FOUNDRY WATERLOO	Black Hawk	1	CEDAR R. ABOVE THE SHELLROCK R.	1	NO TREATMENT				6		
504	0790103	0000060	11/30/2023	JOHN DEERE WATERLOO WORKS	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
505	7740002	0078212	4/30/2024	JOHNSTON, CITY OF MS4	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
506	5625110	0077143	12/31/2026	KENSINGTON FORT MADISON, LLC	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	NO TREATMENT						
507	0398103	0080870	3/31/2028	KERNDT BROTHERS SAVINGS BANK	Allamakee	1	YELLOW R. AND PAINT CR.	1	NO TREATMENT						
508	3126201	0084255	11/30/2025	KEY CITY PLATING	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
509	5715119	0069523	12/2/2024	KING'S MATERIAL, INC.-WASHOUT FACILITY	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
510	6400112	0075591	9/5/2005	KOCH NITROGEN COMPANY, LLC	Marshall	5	IOWA R. ABOVE ALBION	1	NO TREATMENT						
511	7048102	0001741	5/31/2025	KRAFTHEINZ COMPANY, L.P.	Muscatine	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	NO TREATMENT						
512	8245003	0078824	11/30/2024	LECLAIRE, CITY OF MS4	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	NO TREATMENT						
513	3126503	0081833	3/31/2024	LORAS COLLEGE	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
514	3700105	0082066	4/30/2024	LOUIS DREYFUS COMPANY, GRAND JUNCTION, LLC	Greene	4	NORTH RACCOON R.	1	NO TREATMENT						
515	7500120	0052775	12/31/2026	LP NUTRITION	Plymouth	3	FLOYD R.	1	NO TREATMENT						
516	1351000	0082651	2/28/2025	MANSON, CITY OF WTP	Calhoun	3	NORTH RACCOON R.	1	NO TREATMENT						
517	5751002	0078689	8/31/2025	MARION, CITY OF MS4	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
518	6469002	0080039	7/31/2026	MARSHALLTOWN, CITY OF MS4	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	NO TREATMENT						
519	8557000	0082961	8/31/2027	MAXWELL, CITY OF WTP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	NO TREATMENT						
520	2561103	0066982	8/31/2024	MCCREARY COMMUNITY BUILDING MUN. SWIMMING POOL	Dallas	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
521	7727801	0081477	11/30/2024	MERCYONE DES MOINES MEDICAL CENTER	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
522	3050000	0081299	12/31/2023	MILFORD WATER TREATMENT PLANT	Dickinson	3	LITTLE SIOUX R.	1	NO TREATMENT						
523	5500106	0073784	7/31/2025	MURPHY FARMS, LLC	Kossuth	2	EAST FORK DES MOINES R.	1	NO TREATMENT						
524	7000109	0082708	1/18/2015	MUSCATINE POWER & WATER CCR LANDFILL	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	1	NO TREATMENT						
525	3126801	0080331	6/30/2025	NATIONAL MISSISSIPPI RIVER MUSEUM AND AQUARIUM	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
526	5800109	0081701	7/31/2026	NATURAL GAS PIPELINE COMPANY OF AMERICA - SWD #1	Louisa	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
527	5800108	0075485	7/31/2026	NATURAL GAS PIPELINE COMPANY OF AMERICA - A. GRIFFIN M-	Louisa	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
528	0709801	0080047	8/31/2027	NAZARETH LUTHERAN CHURCH	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
529	9433109	0064866	3/31/2028	NESTLE PURINA PETCARE	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
530	3700106	0053431	11/30/2027	NEW COOPERATIVE - COOPER	Greene	4	NORTH RACCOON R.	1	NO TREATMENT						
531	3500204	0052983	9/30/2023	NEW COOPERATIVE, INC.	Franklin	2	IOWA R. ABOVE ALBION	1	NO TREATMENT						
532	5252003	0078794	8/31/2024	NORTH LIBERTY, CITY OF MS4	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
533	0800101	0046957	10/31/2023	NORTHERN NATURAL GAS CO. OGDEN STATION	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
534	9164002	0078913	12/31/2024	NORWALK, CITY OF MS4	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
535	8100100	0004006	6/30/2023	NUTRIEN US LLC	Sac	3	BOYER R.	1	NO TREATMENT						

536	9083003	0078972	2/28/2025	OTTUMWA, CITY OF MS4	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	NO TREATMENT						
537	7780101	0081035	2/28/2025	PEPSI BEVERAGES COMPANY	Polk	5	NORTH RACCOON R.	1	NO TREATMENT						
538	3126802	0081850	5/31/2026	PINEBOX, L.L.L.P.	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
539	4200122	0079138	9/30/2027	PLCP, L.P.	Hardin	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
540	7767002	0078751	11/30/2024	PLEASANT HILL, CITY OF MS4	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
541	7500115	0081248	12/31/2026	PLYMOUTH ENERGY, LLC	Plymouth	3	FLOYD R.	1	NO TREATMENT						
542	4700107	0081558	2/29/2024	POET BIOREFINING - ARTHUR, LLC	Ida	3	MAPLE R.	1	NO TREATMENT			0.713	0.839		
543	7200108	0078051	12/31/2026	POET BIOREFINING - ASHTON, LLC	Osceola	3	ROCK R.	1	NO TREATMENT						
544	3900104	0077003	7/31/2025	POET BIOREFINING - COON RAPIDS, LLC	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	NO TREATMENT						
545	0200104	0080063	8/31/2022	POET BIOREFINING - CORNING	Adams	4	EAST NODAWAY R.	1	NO TREATMENT						
546	3300114	0079812	10/31/2024	POET BIOREFINING - FAIRBANK, LLC	Fayette	1	WAPSIPINICON R. ABOVE ANAMOSA	1	NO TREATMENT						
547	9400120	0079570	10/31/2027	POET BIOREFINING - GOWRIE	Webster	2	NORTH RACCOON R.	1	NO TREATMENT						
548	4000109	0079588	11/30/2023	POET BIOREFINING - JEWELL	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	NO TREATMENT						
549	1200108	0081272	3/31/2024	POET BIOREFINING - SHELL ROCK, LLC	Butler	2	SHELLROCK R.	1	NO TREATMENT						
550	3126502	0081817	2/28/2025	PRESCOTT ELEMENTARY SCHOOL	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
551	0819102	0076953	8/19/2014	PROLIANT HEALTH & BIOLOGICALS	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
552	3000120	0053396	4/20/2023	PROTEXTER STORAGE FACILITY	Dickinson	3	LITTLE SIOUX R.	1	NO TREATMENT						
553	3100201	0080233	10/31/2027	Q CASINO	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
554	0709108	0074071	1/31/2023	QUAD STATE GAUGING & MEASUREMENT	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
555	5715115	0000761	4/30/2027	QUAKER MANUFACTURING, LLC	Linn	1	CEDAR R. BELOW CEDAR RAPIDS	1	NO TREATMENT						
556	1471000	0082392	4/30/2028	RALSTON, CITY OF WATER TREATMENT PLANT	Carroll	4	NORTH RACCOON R.	1	NO TREATMENT						
557	1716107	0081108	1/31/2028	RANDY'S NEIGHBORHOOD MARKET	Cerro Gordo	2	WINNEBAGO R.	1	NO TREATMENT						
558	0768002	0078310	6/30/2025	RAYMOND, CITY OF MS4	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
559	9778152	0080721	6/30/2021	REAGENT CHEMICAL-BIG SOO	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
560	8278002	0078832	8/31/2024	RIVERDALE, CITY OF MS4	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	NO TREATMENT						
561	5776000	0078816	7/31/2025	ROBINS, CITY OF MS4	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
562	3126105	0002984	5/31/2027	ROUSSELOT, INC.	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	NO TREATMENT						
563	9774001	0078859	11/30/2026	SERGEANT BLUFF, CITY OF MS4	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
564	9774000	0052005	10/31/2023	SERGEANT BLUFF, CITY OF WTP	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
565	2326105	0000183	3/31/2028	SETHNESS PRODUCTS COMPANY	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	NO TREATMENT						
566	1200109	0053366	4/30/2027	SHELL ROCK SOY PROCESSING LLC	Butler	2	SHELLROCK R.	1	NO TREATMENT						
567	3000118	0053342	10/4/2023	SHERWOOD FOREST	Dickinson	3	LITTLE SIOUX R.	1	NO TREATMENT						
568	5625111	0081264	9/30/2024	SILGAN CONTAINERS MANUFACTURING CORPORATION	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	NO TREATMENT						
569	9778202	0069493	1/31/2023	SIOUX CITY COMMUNITY SCHOOL DISTRICT	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
570	9778002	0078662	12/31/2027	SIOUX CITY, CITY OF MS4	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
571	8400114	0076791	6/30/2025	SIOUXLAND ENERGY COOPERATIVE	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	NO TREATMENT						
572	7800106	0081043	12/31/2024	SOUTHWEST IOWA RENEWABLE ENERGY	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	NO TREATMENT						
573	1178003	0078638	11/30/2025	STORM LAKE, CITY OF MS4	Buena Vista	3	NORTH RACCOON R.	1	NO TREATMENT						
574	2200105	0052856	1/11/2023	SUPREME BEEF LLC	Clayton	1	TURKEY R.	1	NO TREATMENT						
575	8200100	0001180	6/30/2022	TEXPAR ENERGY, LLC	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	NO TREATMENT	240	40		0.024		
576	5715145	0082236	5/31/2024	THE EASTERN IOWA AIRPORT	Linn	1	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	NO TREATMENT						
577	5625103	0001171	10/31/2025	THE SCOTTS COMPANY	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	NO TREATMENT						
578	3671000	0052637	12/31/2022	THURMAN, CITY OF WATER WORKS	Fremont	4	KEG AND WAUBONSIE CR.S	1	NO TREATMENT						
579	5715144	0079987	6/30/2026	TOWN CENTRE	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
580	9779803	0084034	10/31/2022	Trosper-Hoyt County Services Building	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	NO TREATMENT						
581	5735003	0053358	12/31/2026	TURTLE CREEK PARK SPLASHPAD - CITY OF HIAWATHA	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT			0.0187	0.0374		
582	5290002	0078930	4/30/2025	UNIVERSITY HEIGHTS, CITY OF MS4	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
583	5225108	0069159	3/31/2022	UNIVERSITY OF IOWA COOLING TOWER BLOWDOWN	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
584	5225006	0078182	4/30/2024	UNIVERSITY OF IOWA MS4	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
585	5225101	0003077	5/31/2022	UNIVERSITY OF IOWA POWER PLANT	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	NO TREATMENT						
586	0709004	0079952	8/31/2026	UNIVERSITY OF NORTHERN IOWA MS4	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
587	7780002	0078620	4/30/2024	URBANDALE, CITY OF MS4	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
588	9433115	0079227	5/31/2015	VALERO RENEWABLE FUELS COMPANY, LLC	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
589	7100104	0080829	2/28/2018	VALERO RENEWABLE FUELS COMPANY, LLC	O'Brien	3	LITTLE SIOUX R.	1	NO TREATMENT						
590	3400109	0080403	6/30/2027	VALERO RENEWABLE FUELS CO., LLC dba VALERO CHARLES	Floyd	2	CEDAR R. ABOVE THE SHELLROCK R.	1	NO TREATMENT						
591	7642000	0051122	4/30/2022	VARINA, CITY OF WTP	Pocahontas	3	NORTH RACCOON R.	1	NO TREATMENT						
592	8562102	0053269	5/31/2026	VERBIO NEVADA, LLC	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	NO TREATMENT						
593	0709109	0078140	2/29/2024	VIKING PUMP, INC. - VIKING ROAD FACILITY	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
594	1037101	0060607	2/28/2022	WAPSIE VALLEY CREAMERY, INC.	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	1	NO TREATMENT						
595	0990105	0071714	11/30/2016	WARTBURG COLLEGE	Bremer	1	CEDAR R. ABOVE THE SHELLROCK R.	1	NO TREATMENT						
596	3400501	0080225	8/31/2027	WASHINGTON ELEMENTARY SCHOOL	Floyd	2	CEDAR R. ABOVE THE SHELLROCK R.	1	NO TREATMENT						
597	0700903	0072290	4/30/2025	WATERLOO RESIDENTIAL CORRECTION FACILITY	Black Hawk	1	CEDAR R. ABOVE THE SHELLROCK R.	1	NO TREATMENT				0.1152		
598	0790002	0078301	4/30/2024	WATERLOO, CITY OF MS4	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	NO TREATMENT						
599	2573002	0078875	8/31/2024	WAUKEE, CITY OF MS4	Dallas	5	NORTH RACCOON R.	1	NO TREATMENT						
600	0990106	0080268	5/31/2028	WAVERLY MUNICIPAL FIRE DEPARTMENT	Bremer	1	CEDAR R. ABOVE THE SHELLROCK R.	1	NO TREATMENT						
601	8822101	0077313	2/28/2026	WDC ACQUISITION, LLC dba WELLMAN	Union	4	PLATTE R.	1	NO TREATMENT						
602	4063002	0066281	5/31/2027	WEBSTER CITY MUNICIPAL BLDG.	Hamilton	2	BOONE R.	1	NO TREATMENT						
603	7540104	0073075	5/31/2025	WELLS ENTERPRISES, INC. NORTH ICE CREAM PLANT	Plymouth	3	FLOYD R.	1	NO TREATMENT						
604	7540105	0073083	7/31/2026	WELLS' ENTERPRISES, INC.(SOUTH ICE CREAM PLANT)	Plymouth	3	FLOYD R.	1	NO TREATMENT						
605	7785002	0078778	3/31/2025	WEST DES MOINES, CITY OF MS4	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	NO TREATMENT						
606	3100118	0081175	10/29/2012	WESTERN DUBUQUE BIODIESEL, LLC	Dubuque	1	LITTLE MAQUOKETA R.	1	NO TREATMENT						
607	8100112	0079855	11/30/2024	WESTERN IOWA ENERGY, LLC	Sac	3	BOYER R.	1	NO TREATMENT						
608	9700501	0070289	11/30/2027	WESTWOOD COMMUNITY SCHOOL	Woodbury	3	LITTLE SIOUX R.	1	NO TREATMENT						
609	7791001	0078921	1/31/2027	WINDSOR HEIGHTS, CITY OF MS4	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	NO TREATMENT						
610	1556245	0080519	6/30/2027	A to Z Feeders	Cass	4	EAST NISHNABOTNA R.	1	OTHER						
611	8803002	0052182	7/31/2020	AFTON CITY PARK SPLASHPAD	Union	4	THOMPSON R.	1	OTHER			0.022	0.034		
612	8466409	0083224	3/31/2026	Albert Rens Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						

613	4856996	0077500	9/30/2025	Amana Farms, Inc.	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	OTHER						
614	7561286	0077585	5/31/2027	Anderson Cattle Company	Plymouth	3	FLOYD R.	1	OTHER						
615	7709000	0074489	2/28/2026	ANKENY AQUIFER STORAGE AND RECOVERY WELL	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	OTHER						
616	8278100	0003395	9/30/2023	ARCONIC DAVENPORT WORKS	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	OTHER			0.72	0.72		
617	3126115	0069540	12/31/2022	ARCTIC GLACIER PREMIUM ICE	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	OTHER						
618	8503105	0072061	4/30/2025	ARCTIC GLACIER U.S.A., INC.	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	OTHER			0.005	0.005		
619	6056506	0079502	12/31/2025	ARNEVA CATTLE, LLC	Lyon	3	BIG SIOUX R. ABOVE THE ROCK	1	OTHER						
620	6258708	0080136	4/30/2027	Augustine & Sons, Inc.	Mahaska	5	NORTH SKUNK R.	1	OTHER						
621	9756538	0080187	11/30/2026	B Baldwin Feedlot	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	OTHER						
622	8456228	0077721	8/31/2027	Bar K Cattle LLC - K52	Sioux	3	FLOYD R.	1	OTHER						
623	8457946	0059188	9/30/2024	Bar K Cattle, LLC - Carmel	Sioux	3	FLOYD R.	1	OTHER						
624	8456567	0077518	1/31/2025	Bar K Cattle, LLC - Inwood	Sioux	3	BIG SIOUX R. ABOVE THE ROCK	1	OTHER						
625	4356275	0077526	4/30/2028	Barry Farms	Harrison	4	BOYER R.	1	OTHER						
626	6057418	0080497	12/31/2027	Beef & Bacon Drive, Inc.	Lyon	3	ROCK R.	1	OTHER						
627	7556281	0080411	8/31/2027	Beitelspacher Land and Cattle, LLC	Plymouth	3	FLOYD R.	1	OTHER						
628	8465835	0081761	5/31/2024	Bell Lake Cattle Company	Sioux	3	FLOYD R.	1	OTHER						
629	2863481	0079219	12/31/2025	Beswick Farms	Delaware	1	MAQUOKETA R.	1	OTHER						
630	2985103	0077046	1/31/2018	BNSF RAILWAY COMPANY	Des Moines	6	FLINT R.	1	OTHER			0.0202	0.0202		
631	8463263	0079332	3/31/2026	Boerdery Inc.	Sioux	3	FLOYD R.	1	OTHER						
632	0819000	0079421	2/28/2025	Boone, City of WTP	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	OTHER						
633	3100100	0001210	9/30/2023	BP PRODUCTS DUBUQUE TERMINAL	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	OTHER						
634	8464000	0083119	2/28/2026	Brad Pollema Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
635	4166181	0082465	9/30/2024	Branstad Farms	Hancock	2	WINNEBAGO R.	1	OTHER						
636	7158774	0083941	7/31/2025	Brent Rieck Feedlot	O'Brien	3	LITTLE SIOUX R.	1	OTHER						
637	7758687	0038911	1/31/2023	Brenton Brothers, Inc	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	OTHER						
638	8459250	0082813	5/31/2025	Brian Roorda Dairy, LLC	Sioux	3	FLOYD R.	1	OTHER						
639	1456263	0080284	3/31/2027	Brian Soyer Feedlot	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	OTHER						
640	7256597	0079481	3/31/2026	Bruce A. Lorch, Inc	Osceola	3	LITTLE SIOUX R.	1	OTHER						
641	8457054	0052492	8/31/2026	Bruce Van Kekerix Feedlot	Sioux	3	BIG SIOUX R. ABOVE THE ROCK	1	OTHER						
642	8209100	0001198	3/31/2025	BUCKEYE TERMINALS, LLC - BETTENDORF TERMINAL	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	OTHER						
643	5200109	0072273	5/31/2028	BUCKEYE TERMINALS, LLC - CEDAR RAPIDS TERMINAL	Johnson	6	CEDAR R. BELOW CEDAR RAPIDS	1	OTHER						
644	7820112	0071234	6/30/2024	BUCKEYE TERMINALS, LLC - COUNCIL BLUFFS TERMINAL	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	OTHER						
645	9000103	0072281	9/30/2027	BUCKEYE TERMINALS, LLC - OTTUMWA TERMINAL	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	OTHER						
646	7556471	0080217	9/30/2027	Bull Creek Feedlot	Plymouth	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
647	2909000	0084271	10/31/2025	BURLINGTON MUNICIPAL WATERWORKS	Des Moines	6	FLINT R.	1	OTHER						
648	9600301	0072265	9/30/2024	BURR OAK SEWER COMMISSION-STP	Winneshiek	1	UPPER IOWA R.	2	OTHER	153	25.5	0.015	0.015		
649	6056865	0081370	9/30/2023	C & C Feedlot	Lyon	3	ROCK R.	1	OTHER						
650	3000800	0083879	5/31/2025	CENTRAL WATER SYSTEM	Dickinson	3	LITTLE SIOUX R.	1	OTHER						
651	9400122	0053461	3/31/2028	CERTAINTEED GYPSUM MINE	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	OTHER						
652	9700104	0004014	1/31/2027	CF INDUSTRIES NITROGEN, LLC - PORT NEAL NITROGEN	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	OTHER						
653	1800900	0082791	12/31/2023	CHEROKEE RURAL WATER DISTRICT #1 - CHEROKEE	Cherokee	3	LITTLE SIOUX R.	1	OTHER						
654	8456296	0079154	1/31/2028	Circle G Cattle, LLC	Sioux	3	FLOYD R.	1	OTHER						
655	8503002	0033235	5/31/2022	CITY OF AMES STEAM ELECTRIC PLANT	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	OTHER						
656	8456363	0080101	9/30/2026	City View Farms - West	Sioux	3	FLOYD R.	1	OTHER						
657	7160334	0077569	8/31/2024	City View Farms East	O'Brien	3	LITTLE SIOUX R.	1	OTHER						
658	1556657	0078069	10/31/2023	Clan Farms, Inc	Cass	4	EAST NISHNABOTNA R.	1	OTHER						
659	8456473	0083682	8/31/2027	Claussen Farms	Sioux	3	ROCK R.	1	OTHER						
660	8200107	0063525	9/30/2024	CONTINENTAL CEMENT COMPANY, LLC - DAVENPORT PLANT	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	OTHER						
661	1427000	0049692	12/31/2024	COON RAPIDS MUNICIPAL UTILITIES WTP	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	OTHER						
662	1356238	0079731	5/31/2027	Corey Agr, Inc. of Lytton Beef Feeding	Calhoun	3	NORTH RACCOON R.	1	OTHER						
663	7820000	0077470	12/31/2018	COUNCIL BLUFFS NARROWS TREATMENT PLANT	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	OTHER						
664	7820004	0082074	8/31/2022	COUNCIL POINT WATER PURIFICATION PLANT	Pottawattamie	4	KEG AND WAUBONSIE CR.S	1	OTHER						
665	8556450	0079561	5/31/2027	Couser Cattle Company	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	OTHER						
666	4356318	0080667	4/30/2028	Crossroads Cattle Company	Harrison	4	BOYER R.	1	OTHER						
667	4515103	0064955	10/26/2009	CULLIGAN WATER CONDITIONING OF CRESCO	Howard	1	UPPER IOWA R.	1	OTHER						
668	3065340	0082970	9/30/2025	D & G Farms	Dickinson	3	LITTLE SIOUX R.	1	OTHER						
669	8466282	0083500	8/31/2026	D & H Feedlot	Sioux	3	ROCK R.	1	OTHER						
670	6066014	0081990	1/31/2024	D&B Feedlot	Lyon	3	BIG SIOUX R. ABOVE THE ROCK	1	OTHER						
671	7666839	0083933	1/31/2028	Dallas Janssen Heifer Ranch	Pocahontas	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	OTHER						
672	8456760	0079880	2/29/2028	Darin Pollema Feedlot	Sioux	3	ROCK R.	1	OTHER						
673	3056816	0080128	1/31/2027	David and Dan Lorch Combined Operation	Dickinson	3	LITTLE SIOUX R.	1	OTHER						
674	1856511	0079618	9/30/2027	Deer Run Ranch	Cherokee	3	LITTLE SIOUX R.	1	OTHER						
675	2424000	0077160	4/30/2023	DENISON MUNICIPAL WTP	Crawford	4	BOYER R.	1	OTHER			0.0576	0.1152		
676	7727127	0069671	1/31/2025	DES MOINES TCE SUPERFUND SITE	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	OTHER						
677	8456302	0080349	10/31/2027	DG Farms, Inc.	Sioux	3	FLOYD R.	1	OTHER						
678	9600901	0054798	2/28/2025	DNR DECORAH STATE HATCHERY	Winneshiek	1	UPPER IOWA R.	1	OTHER						
679	2800900	0002275	3/31/2025	DNR MANCHESTER TROUT HATCHERY	Delaware	1	MAQUOKETA R.	1	OTHER	101					
680	9700401	0063631	9/30/2027	DNR SNYDER-WINNEBAGO LAKE	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	OTHER						
681	8464489	0083054	4/30/2025	Dry Creek Farms, Inc.	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
682	8456490	0078107	10/31/2027	East Valley Farm, Inc. (Site 1)	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
683	3126118	0076821	11/30/2022	EDWARDS CAST STONE COMPANY	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	OTHER						
684	8456276	0079189	9/30/2025	Eilts Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
685	5131000	0082325	9/30/2025	FAIRFIELD WATERWORKS	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	1	OTHER						
686	8462532	0078379	5/31/2025	Fairview Feeders	Sioux	3	BIG SIOUX R. ABOVE THE ROCK	1	OTHER						
687	7856253	0053350	4/30/2027	FEEDLOT SERVICE CO.	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	OTHER						
688	7700100	0000671	9/3/2008	FIRESTONE AGRICULTURAL TIRE CO.	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	OTHER						
689	5625000	0081001	1/31/2024	FORT MADISON WATER TREATMENT PLANT	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	OTHER						

690	1856935	0084042	7/31/2024	Gary Rupp Combined Operation	Cherokee	3	LITTLE SIOUX R.	1	OTHER						
691	6066047	0082058	8/31/2025	Gaylon Rozeboom Feedlot	Lyon	3	ROCK R.	1	OTHER						
692	7078101	0061972	2/29/2028	GERDAU	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	1	OTHER						
693	2760056	0077712	9/30/2024	Grand River Cattle Co, LLC	Decatur	5	THOMPSON R.	1	OTHER						
694	8461591	0083011	9/30/2023	Green Cattle Company (Darin)	Sioux	3	FLOYD R.	1	OTHER						
695	0140000	0048453	3/31/2028	GREENFIELD MUNICIPAL UTILITIES WTP	Adair	4	THOMPSON R.	1	OTHER						
696	6556217	0077909	7/31/2027	Gregory Feedlots, Inc. (North)	Mills	4	KEG AND WAUBONSIE CR.S	1	OTHER						
697	3663404	0079804	7/31/2027	Gregory Feedlots, Inc. (South Site)	Fremont	4	WEST NISHNABOTNA R.	1	OTHER						
698	6056953	0080900	8/31/2023	Groeneweg Livestock Facility	Lyon	3	ROCK R.	1	OTHER						
699	9756605	0081132	5/31/2028	Hamann Feedlot	Woodbury	3	LITTLE SIOUX R.	1	OTHER						
700	7556900	0078581	5/31/2026	Hansen Feed Yards	Plymouth	3	PERRY CR.	1	OTHER						
701	6056433	0081159	4/30/2028	Hansmann Feedlot	Lyon	3	ROCK R.	1	OTHER						
702	8335000	0084387	5/31/2026	HARLAN MUNICIPAL UTILITIES WATER TREATMENT PLANT	Shelby	4	WEST NISHNABOTNA R.	1	OTHER						
703	8459740	0079499	5/31/2028	Haverhals Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
704	5640106	0063045	9/30/2027	HENDRICKS RIVER LOGISTICS, LLC	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	OTHER						
705	7557919	0080977	3/31/2028	Hiemstra Farms	Plymouth	3	WEST FORK LITTLE SIOUX R.	1	OTHER						
706	1750116	0071951	5/31/2027	HOLCIM (US) INC. - WEST QUARRY	Cerro Gordo	2	WINNEBAGO R.	1	OTHER						
707	8460406	0082520	8/31/2026	Hoogland Dairy	Sioux	3	FLOYD R.	1	OTHER						
708	8456222	0077615	9/30/2024	Hoogland Feedlot	Sioux	3	FLOYD R.	1	OTHER						
709	7157435	0080365	3/31/2028	Hunt Brothers Feedlot	O'Brien	3	FLOYD R.	1	OTHER						
710	0375101	0059102	10/31/2022	INDUSTRIAL LAMINATES/NORPLEX INCORPORATED	Allamakee	1	TURKEY R.	1	OTHER						
711	8222121	0079430	10/31/2024	IOWA AMERICAN WATER COMPANY EAST RIVER STATION	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	OTHER						
712	5225000	0076082	12/31/2023	IOWA CITY WATER TREATMENT PLANT	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	OTHER						
713	4800802	0080969	7/31/2024	IOWA COUNTY WATER TREATMENT FACILITY	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	OTHER						
714	7455000	0081183	9/30/2025	IOWA LAKES REGIONAL WATER OSGOOD PLANT	Palo Alto	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	OTHER			0.66	0.567		
715	0900106	0079693	10/31/2022	IOWA REGIONAL UTILITIES ASSOCIATION	Bremer	1	SHELLROCK R.	1	OTHER						
716	8503100	0032697	5/31/2023	IOWA STATE UNIVERSITY POWER PLANT	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	OTHER						
717	0300100	0003735	5/31/2021	IPL - LANSING GENERATING STATION	Allamakee	1	YELLOW R. AND PAINT CR.	1	OTHER						
718	5715108	0000540	10/31/2021	IPL - PRAIRIE CREEK GENERATING STATION	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	OTHER						
719	1556301	0078476	2/29/2024	J. W. Freund Farms, Inc.	Cass	4	EAST NISHNABOTNA R.	1	OTHER						
720	1456478	0080292	3/31/2027	James Pudenz Inc	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	OTHER						
721	1556742	0080306	7/31/2027	JDH, Inc. Feedlot	Cass	4	NODAWAY R.	1	OTHER						
722	6056976	0082091	1/31/2025	JEFF GROENEWEG FEEDLOT	Lyon	3	ROCK R.	1	OTHER						
723	8461290	0077879	9/30/2025	JGM Feedlot LLC	Sioux	3	FLOYD R.	1	OTHER						
724	8222107	0059501	12/31/2025	JOHN DEERE DAVENPORT WORKS	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	OTHER						
725	0790102	0062481	5/31/2024	JOHN DEERE PRODUCT ENGINEERING CENTER	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	OTHER						
726	6056833	0079685	6/30/2027	John Fluit Jr., Beef Feedlot	Lyon	3	ROCK R.	1	OTHER						
727	1456269	0081337	6/30/2023	JOSH PUDENZ	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	OTHER						
728	6059150	0084131	8/31/2023	JRT Focus Farms Ltd, Site 1	Lyon	3	BIG SIOUX R. ABOVE THE ROCK	1	OTHER						
729	8460404	0077577	9/30/2026	K & D Feedyards, LLC	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
730	8463595	0080438	8/31/2027	Kekerix Kattle Co.	Sioux	3	ROCK R.	1	OTHER						
731	7561752	0080179	4/30/2027	Kellen Feedlot	Plymouth	3	FLOYD R.	1	OTHER						
732	4566247	0083062	7/31/2025	Kenneth Moellers - Hayek Farm	Howard	1	TURKEY R.	1	OTHER						
733	5640104	0033600	7/31/2027	KEOKUK ENERGY CENTER	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	2	OTHER			0.001	0.001		
734	8466255	0083151	5/31/2026	Kirk Den Herder Feedlot	Sioux	3	FLOYD R.	1	OTHER						
735	1340000	0084379	10/31/2022	KNIERIM, CITY OF WTP	Calhoun	3	NORTH RACCOON R.	1	OTHER						
736	8456598	0053218	6/30/2025	Koenen Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
737	8466384	0083852	5/31/2028	Kooima Custom Feed	Sioux	3	ROCK R.	1	OTHER						
738	3900800	0084212	12/31/2022	LAKE PANORAMA ASSOCIATION WTP	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	OTHER						
739	8461089	0077704	4/30/2028	Lake States Cattle Co. LLC	Sioux	3	FLOYD R.	1	OTHER						
740	8465430	0053261	11/30/2025	Lance Rus	Sioux	3	ROCK R.	1	OTHER						
741	9756513	0082619	3/31/2025	Larry Guthridge Combined Operation	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	OTHER						
742	7614000	0082473	12/31/2024	LAURENS, CITY OF WTP	Pocahontas	3	NORTH RACCOON R.	1	OTHER						
743	0556260	0080080	11/30/2026	Lauritsen Cattle Company	Audubon	4	EAST NISHNABOTNA R.	1	OTHER						
744	1750113	0072907	8/31/2024	LEHIGH CEMENT COMPANY LLC	Cerro Gordo	2	WINNEBAGO R.	1	OTHER						
745	2742000	0081787	6/30/2018	LEON WATER TREATMENT PLANT	Decatur	5	GRAND R.	1	OTHER						
746	8459032	0083895	11/30/2023	Les Ranschau - Ranschau Enterprises	Sioux	3	ROCK R.	1	OTHER						
747	8562100	0079375	9/30/2024	LINCOLNWAY ENERGY, LLC	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	OTHER						
748	1800112	0077275	4/30/2025	LITTLE SIOUX CORN PROCESSORS, LLC	Cherokee	3	LITTLE SIOUX R.	1	OTHER						
749	5200323	0080730	4/30/2024	LONGVIEW ESTATES HOA	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	OTHER	144	24	0.014	0.014		
750	2500904	0079669	10/31/2024	LOUISE P. MOON ASR FACILITY	Dallas	5	NORTH RACCOON R.	1	OTHER						
751	7720201	0068438	3/31/2024	LOVE'S TRAVEL SHOP 411	Polk	5	NORTH RACCOON R.	1	OTHER						
752	7861300	0077691	4/30/2028	LV Feedlot, LLC	Pottawattamie	4	WEST NISHNABOTNA R.	1	OTHER						
753	8400700	0080535	6/14/2014	LYON & SIOUX RWS BOYDEN SUBSYTEM WTP	Sioux	3	ROCK R.	1	OTHER						
754	8457177	0082449	5/31/2025	Maassen & Sons Combined Facility	Sioux	3	FLOYD R.	1	OTHER						
755	7727126	0064076	3/31/2016	MAGELLAN PIPELINE COMPANY, L.P.	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	OTHER						
756	9756759	0080098	10/31/2026	Mark Baldwin Feedlot	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	OTHER						
757	7556898	0080446	11/30/2023	Mark Beitelspacher Feedlot	Plymouth	3	FLOYD R.	1	OTHER						
758	8459758	0083810	8/31/2027	Mars Farms, Inc.	Sioux	3	FLOYD R.	1	OTHER						
759	1750000	0077305	2/29/2024	MASON CITY, CITY OF WTP	Cerro Gordo	2	WINNEBAGO R.	1	OTHER						
760	2900110	0075035	12/31/2021	MATTESON MARINE SERVICE, INC.	Des Moines	6	FLINT R.	1	OTHER						
761	8462015	0077844	10/31/2021	Meadowvale Dairy - North Site	Sioux	3	ROCK R.	1	OTHER						
762	8461393	0077852	12/5/2017	Meadowvale Dairy - South	Sioux	3	ROCK R.	1	OTHER						
763	9700102	0004103	11/30/2022	MIDAMERICAN ENERGY - NEAL NORTH ENERGY CENTER	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	OTHER						
764	9700106	0061859	8/31/2022	MIDAMERICAN ENERGY - NEAL SOUTH ENERGY CTR	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	OTHER						
765	5800105	0063282	3/31/2025	MIDAMERICAN ENERGY CO. - LOUISA STATION	Louisa	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	OTHER						
766	3100203	0052589	8/31/2027	MIRACLE CAR WASH	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	OTHER						

767	4344000	0080454	4/30/2024	MISSOURI VALLEY CITY OF WTP	Harrison	4	BOYER R.	1	OTHER						
768	9756524	0079294	7/31/2025	MJ Cattle Company	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	OTHER						
769	7950000	0084310	7/31/2024	Montezuma, City of WTP	Poweshiek	5	NORTH SKUNK R.	1	OTHER						
770	7864122	0083321	4/30/2026	Moran Beef #2	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	OTHER						
771	7856509	0079537	4/30/2026	Moran Beef, Inc.	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	OTHER						
772	6056614	0083828	10/31/2027	Moser Feedlot	Lyon	3	ROCK R.	1	OTHER						
773	7048106	0001082	2/28/2018	MUSCATINE POWER AND WATER	Muscatine	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	OTHER						
774	5800107	0058262	5/31/2028	NATURAL GAS PIPELINE CO OF AMERICA #204	Louisa	6	IOWA R. BELOW NORTH LIBERTY	1	OTHER						
775	9800114	0052535	2/14/2021	NEW HEAVEN CHEMICALS IOWA LLC - SMO MANUFACTURING	Worth	2	SHELLROCK R.	1	OTHER						
776	7856255	0077666	1/31/2025	North Ridge Feedlot	Pottawattamie	4	WEST NISHNABOTNA R.	1	OTHER						
777	2500122	0077038	3/31/2027	NORTHERN NATURAL GAS - UNDERGROUND INJECTION WELL	Dallas	5	MIDDLE AND SOUTH RACCOON R.S	1	OTHER						
778	4100100	0064327	7/31/2025	NORTHERN NATURAL GAS CO. VENTURA STATION	Hancock	2	IOWA R. ABOVE ALBION	1	OTHER						
779	4100115	0052829	3/13/2024	NORTHERN NATURAL GAS CO., GARNER - LAOP	Hancock	2	IOWA R. ABOVE ALBION	1	OTHER						
780	7820106	0046752	2/28/2027	NUSTAR COUNCIL BLUFFS TERMINAL	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	OTHER						
781	7856376	0080144	8/31/2026	NVF Co, LLC	Pottawattamie	4	WEST NISHNABOTNA R.	1	OTHER						
782	6056581	0053137	9/30/2024	NW Iowa Feeders LLP	Lyon	3	ROCK R.	1	OTHER						
783	7100700	0052702	12/31/2023	OCRWS SOUTH WATER TREATMENT PLANT	O'Brien	3	LITTLE SIOUX R.	1	OTHER						
784	7565053	0080802	3/31/2028	Ohlendorf Feeders	Plymouth	3	FLOYD R.	1	OTHER						
785	3056332	0077534	4/30/2025	Olson Farm, Inc	Dickinson	3	LITTLE SIOUX R.	1	OTHER						
786	8474000	0077496	12/16/2013	ORANGE CITY, CITY OF WTP	Sioux	3	FLOYD R.	1	OTHER						
787	9083000	0000035	12/31/2026	OTTUMWA WATER WORKS, CITY OF	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	OTHER			0.74	0.74		
788	5260000	0082252	7/6/2014	OXFORD WATER TREATMENT PLANT	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	OTHER						
789	6900100	0004693	3/31/2023	PARKER-HANNIFIN CORPORATION	Montgomery	4	EAST NISHNABOTNA R.	1	OTHER						
790	2200102	0080624	2/28/2023	PATTISON SAND CO., LLC	Clayton	1	MISSISSIPPI R. ABOVE THE TURKEY R.	1	OTHER						
791	7257895	0053072	4/30/2024	Paul Feldkamp	Osceola	3	ROCK R.	1	OTHER						
792	6368000	0075001	5/31/2027	PELLA WATER TREATMENT PLANT	Marion	5	DES MOINES R. BELOW WHITEBREAST CR.	1	OTHER						
793	1156419	0079201	9/30/2025	Peterson Cattle Company	Buena Vista	3	NORTH RACCOON R.	1	OTHER						
794	9757143	0079316	8/31/2025	Peterson Feedlot - Whiskey Creek	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	OTHER						
795	2756899	0080861	12/13/2017	Petty Custom Cattle Feeding (Silverado Feeder Holdings)	Decatur	5	THOMPSON R.	1	OTHER						
796	7856795	0080314	3/31/2027	Pheasant Ridge Farm, Inc.	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	OTHER						
797	8200202	0076007	2/29/2024	PILOT TRAVEL CENTER #043	Scott	6	CEDAR R. BELOW CEDAR RAPIDS	1	OTHER						
798	9756576	0080683	5/31/2027	Pithan Feedlots, Inc.	Woodbury	3	LITTLE SIOUX R.	1	OTHER						
799	5600108	0070602	2/29/2028	PNB PROCESSORS, L.L.C.	Lee	6	SKUNK R. BELOW THE NORTH SKUNK	1	OTHER						
800	7400102	0078492	8/31/2024	POET BIOREFINING - EMMETSBURG, LLC	Palo Alto	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	OTHER						
801	8456323	0078981	7/31/2025	Poverty Acres Feedlot, Inc	Sioux	3	FLOYD R.	1	OTHER						
802	9083104	0078000	9/30/2023	QUEST LINER, INC. - LAOP	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	OTHER						
803	8464425	0083861	5/31/2028	Randy Kats Feedlot	Sioux	3	ROCK R.	1	OTHER						
804	0400918	0075418	1/31/2024	RATHBUN REGIONAL WATER ASSOCIATION	Appanoose	5	CHARITON R.	1	OTHER				0.038		
805	8464082	0083097	11/30/2025	Red Rock Cattle	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
806	1400108	0052331	6/30/2026	REG RALSTON LLC	Carroll	4	NORTH RACCOON R.	1	OTHER						
807	8300105	0077429	4/30/2023	REGIONAL WATER RURAL WATER ASSOCIATION WATER PLANT	Shelby	4	WEST NISHNABOTNA R.	1	OTHER						
808	4700106	0077259	7/31/2022	RELIANT PROCESSING GALVA PLANT	Ida	3	MAPLE R.	1	OTHER						
809	8456481	0078387	6/30/2023	Remmerde Farms	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
810	8456546	0080527	12/31/2027	Rick Koenen Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
811	7159443	0081230	6/30/2023	Ritter Cattle Company	O'Brien	3	FLOYD R.	1	OTHER						
812	6056382	0079022	10/31/2024	Rock River Feedyards, Inc.	Lyon	3	ROCK R.	1	OTHER						
813	6066387	0083267	10/31/2021	Rock River Jerseys Combined Dairy	Lyon	3	ROCK R.	1	OTHER						
814	8456731	0079341	6/30/2027	Rolling Hills Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
815	9958000	0053307	6/30/2026	ROWAN MUNICIPAL WATER SUPPLY	Wright	2	IOWA R. ABOVE ALBION	1	OTHER						
816	1856879	0079065	12/31/2019	RTCP Farm Partnership (Spring Valley Ranch)	Cherokee	3	LITTLE SIOUX R.	1	OTHER						
817	8400702	0083291	2/28/2025	RURAL WATER SYSTEM #1 - PLANT #3	Sioux	3	FLOYD R.	1	OTHER						
818	8456936	0079472	3/31/2028	Rus Farms Inc	Sioux	3	ROCK R.	1	OTHER						
819	1456442	0052403	1/31/2027	Russ Pudenz Farms, Inc.	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	OTHER						
820	7556723	0079600	7/31/2026	Russell Schmidt Feedlot	Plymouth	3	FLOYD R.	1	OTHER						
821	7856416	0079171	7/31/2026	S & B Feedyard	Pottawattamie	4	WEST NISHNABOTNA R.	1	OTHER						
822	1160248	0077755	4/30/2026	S & S Farms, Inc.	Buena Vista	3	NORTH RACCOON R.	1	OTHER						
823	7727011	0079847	5/31/2025	SAYLORVILLE WATER TREATMENT PLANT	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	OTHER						
824	8356843	0079511	5/31/2026	Schechinger Farms, Inc.	Shelby	4	WEST NISHNABOTNA R.	1	OTHER						
825	7556231	0080471	11/30/2027	Schnepf Farms	Plymouth	3	FLOYD R.	1	OTHER						
826	8165218	0083836	11/30/2027	SFI, Inc.	Sac	3	NORTH RACCOON R.	1	OTHER						
827	7383000	0079081	10/31/2018	SHENANDOAH, CITY OF WTP	Page	4	EAST NISHNABOTNA R.	1	OTHER						
828	7861149	0078409	3/31/2025	SILVER CREEK FEEDERS	Pottawattamie	4	WEST NISHNABOTNA R.	1	OTHER						
829	7700802	0052799	8/31/2023	SOUTHWEST POLK WATER SERVICE	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	OTHER						
830	7000108	0074101	8/31/2024	SSAB IOWA INC.	Muscatine	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	OTHER						
831	8456480	0080110	10/31/2026	Stan Eisma Feedlot	Sioux	3	FLOYD R.	1	OTHER						
832	3200105	0052462	10/31/2020	STATELINE COOPERATIVE	Emmet	3	EAST FORK DES MOINES R.	1	OTHER						
833	4764288	0080462	12/31/2027	Steve Meyer Feedlot	Ida	3	LITTLE SIOUX R.	1	OTHER						
834	0709102	0002534	5/31/2027	STREETER GENERATING STATION	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	OTHER			1.44	1.44		
835	2839100	0063533	1/31/2025	STRYTEN MANCHESTER, LLC	Delaware	1	MAQUOKETA R.	1	OTHER			0.1345			
836	8456715	0079103	6/30/2025	Sunrise Feedlot, Inc.	Sioux	3	ROCK R.	1	OTHER						
837	8670000	0052527	2/28/2021	TAMA WATER TREATMENT PLANT (POWESHIEK WATER	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	OTHER						
838	1863496	0080420	9/30/2027	Tentinger Feedlot	Cherokee	3	LITTLE SIOUX R.	1	OTHER						
839	6066472	0053196	7/31/2025	THANE FLUIT FEEDLOT	Lyon	3	ROCK R.	1	OTHER						
840	9000106	0083453	10/31/2016	THE AMERICAN BOTTLING COMPANY	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	OTHER						
841	2424103	0079456	9/30/2027	THE ANDERSONS MARATHON HOLDINGS, LLC	Crawford	4	BOYER R.	1	OTHER						
842	3126803	0084115	6/30/2022	THE GRAND OPERA HOUSE	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	OTHER						
843	8457953	0080195	11/30/2026	Tower 6 Feeders LLC	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						

844	8456485	0080594	11/30/2025	Trans Ova Genetics	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
845	5485500	0068390	10/31/2002	TRI-COUNTY COMMUNITY SCHOOL	Keokuk	6	NORTH SKUNK R.	1	OTHER	401	67	0.0068	0.0068		
846	1856642	0080021	11/30/2026	Triple U North (Stowater)	Cherokee	3	WEST FORK LITTLE SIOUX R.	1	OTHER						
847	9760300	0077780	4/30/2027	Triple U Ranch, LLC	Woodbury	3	LITTLE SIOUX R.	1	OTHER						
848	0709501	0063941	4/30/2026	UNIVERSITY OF NORTHERN IOWA	Black Hawk	1	CEDAR R. ABOVE THE SHELLROCK R.	1	OTHER						
849	5500112	0077194	3/31/2024	VALERO RENEWABLE FUELS CO, LLC - dba VALERO LAKOTA	Kossuth	2	BLUE EARTH R.	1	OTHER			0.076	0.09		
850	1100108	0080209	2/28/2025	VALERO RENEWABLE FUELS CO., LLC - dba VALERO ALBERT	Buena Vista	3	NORTH RACCOON R.	1	OTHER						
851	8456476	0077682	9/30/2026	Valley View Feedlots, Inc.	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
852	8456294	0079464	1/31/2026	Van Berkel Farms - Home Site	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
853	8458505	0083089	9/30/2026	Van Berkel Farms - Kooi Site	Sioux	3	BIG SIOUX R. ABOVE THE ROCK	1	OTHER						
854	8456950	0079529	2/29/2024	Van Essen Feedlot	Sioux	3	ROCK R.	1	OTHER						
855	8457021	0082848	6/30/2025	Van Holland Farm, Inc	Sioux	3	ROCK R.	1	OTHER						
856	3956251	0078590	11/30/2027	Van Meter Feedyard, LLC	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	OTHER						
857	8457694	0080659	3/31/2028	Van Voorst Cattle, Inc.	Sioux	3	FLOYD R.	1	OTHER						
858	8459625	0083712	12/31/2027	Van Voorst Dairy	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
859	8461718	0083381	5/31/2024	Van Wyhe Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
860	7257127	0079197	12/31/2026	Vander Lee Feedlot	Osceola	3	LITTLE SIOUX R.	1	OTHER						
861	8463232	0082899	12/31/2025	Vander Waal Brothers, Inc.	Sioux	3	FLOYD R.	1	OTHER						
862	6256457	0077798	2/29/2028	Ver Steegh Brothers Feedlot	Mahaska	5	DES MOINES R. BELOW WHITEBREAST CR.	1	OTHER						
863	8456496	0080608	1/31/2028	Vermeer & Sons Farms-Feedlot	Sioux	3	FLOYD R.	1	OTHER						
864	7820101	0004308	7/31/2026	WALTER SCOTT JR. ENERGY CENTER	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	OTHER						
865	5400800	0082511	2/28/2015	WAPELLO RWA WATER TREATMENT PLANT	Keokuk	6	SKUNK R. ABOVE THE NORTH SKUNK	1	OTHER						
866	7356421	0080713	7/31/2027	Wellhausen Feedlots	Page	4	NODAWAY R.	1	OTHER						
867	1456300	0077810	2/28/2027	Wendl Feedlot	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	OTHER						
868	2300103	0080951	1/31/2027	WENDLING QUARRIES - BEHR QUARRY	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	1	OTHER						
869	7000107	0080926	5/31/2024	WENDLING QUARRIES - MOSCOW QUARRY	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	1	OTHER						
870	5700117	0080934	5/31/2025	WENDLING QUARRIES - ROBINS QUARRY	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	OTHER						
871	1400900	0052484	10/31/2027	WEST CENTRAL IOWA RURAL WATER ASSOCIATION	Carroll	4	WEST NISHNABOTNA R.	1	OTHER						
872	1856845	0080616	10/31/2027	West Fork Feedlot	Cherokee	3	WEST FORK LITTLE SIOUX R.	1	OTHER						
873	1456552	0080250	2/28/2027	Wiederin Feedlot	Carroll	4	BOYER R.	1	OTHER						
874	2537102	0079162	10/31/2024	WILLIS AUTOMOTIVE, LLC – OASIS LASER WASH	Dallas	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	OTHER				0.0122		
875	8456342	0081191	11/30/2027	Winterfeld Cattle Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
876	6171000	0079961	10/31/2023	WINTERSET WATER TREATMENT PLANT	Madison	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	OTHER						
877	8462847	0084301	9/30/2025	Witt Brothers Feedlot	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	OTHER						
878	6061304	0077640	2/29/2024	Wynia Cattle	Lyon	3	ROCK R.	1	OTHER						
879	7256367	0083984	7/31/2027	Zylstra Feedlot (AT)	Osceola	3	ROCK R.	1	OTHER						
880	3102001	0069922	4/30/2025	ASBURY CITY OF STP	Dubuque	1	LITTLE MAQUOKETA R.	2	OXIDATION DITCH	6228	1040	0.538	0.803	WW	III
881	0505001	0035203	1/31/2020	AUDUBON CITY OF STP	Audubon	4	EAST NISHNABOTNA R.	1	OXIDATION DITCH	3233	540	0.277	0.967	WW	III
882	5903001	0028924	3/31/2023	CHARITON CITY OF STP	Lucas	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	OXIDATION DITCH	8048	1344	0.607	1.115	WW	III
883	3405001	0022039	5/31/2026	CHARLES CITY, CITY OF STP	Floyd	2	CEDAR R. ABOVE THE SHELLROCK R.	2	OXIDATION DITCH	40216	6716	2.41	4.66	WW	IV
884	5208001	0020788	3/31/2026	CORALVILLE CITY OF STP	Johnson	6	IOWA R. BELOW NORTH LIBERTY	2	OXIDATION DITCH	58814	9822	3.71	5.754	WW	IV
885	2330001	0035271	11/30/2021	DEWITT CITY OF STP	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	2	OXIDATION DITCH	10096	1686	1.2	2.14	WW	III
886	3815001	0023311	8/31/2025	DIKE CITY OF STP	Grundy	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	OXIDATION DITCH	2605	435	0.26	0.79	WW	III
887	9926001	0034380	11/30/2024	EAGLE GROVE, CITY OF STP	Wright	2	BOONE R.	2	OXIDATION DITCH	33545	5602	2.5	4.15	WW	IV
888	5131001	0035076	5/31/2026	FAIRFIELD, CITY OF STP	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	2	OXIDATION DITCH	29593	4942	1.3	4.2	WW	IV
889	8222201	0074110	6/30/2025	FLYING J TRAVEL PLAZA NO. 636 - DAVENPORT	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	OXIDATION DITCH						
890	7930001	0031186	12/31/2024	GRINNELL, CITY OF STP	Poweshiek	5	NORTH SKUNK R.	2	OXIDATION DITCH	17551	2931	1.666	4.236	WW	IV
891	7128001	0036480	6/30/2024	HARTLEY CITY OF STP	O'Brien	3	LITTLE SIOUX R.	1	OXIDATION DITCH	2904	485	0.24	0.78	WW	III
892	9133004	0053405	8/31/2027	INDIANOLA WATER RESOURCE RECOVERY FACILITY	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	OXIDATION DITCH	28186	4707	2.3	5.91	WW	IV
893	9083101	0060569	12/31/2027	JBS PORK	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	2	OXIDATION DITCH	451683	75431	2.14	2.41		
894	6663001	0032956	4/30/2024	OSAGE CITY OF STP	Mitchell	2	CEDAR R. ABOVE THE SHELLROCK R.	2	OXIDATION DITCH	14760	2465	0.968	1.071	WW	III
895	3150000	0075507	2/28/2027	PEOSTA, CITY OF STP	Dubuque	1	MAQUOKETA R.	3	OXIDATION DITCH	5587	933	0.231	0.442	WW	III
896	5282001	0036978	5/31/2027	SOLON CITY OF STP	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	OXIDATION DITCH	4054	677	0.38	0.68	WW	III
897	0970001	0033766	12/31/2027	SUMNER CITY OF STP	Bremer	1	WAPSIPINICON R. ABOVE ANAMOSA	1	OXIDATION DITCH	2545	425	0.206	0.82	WW	III
898	3405000	0003182	3/31/2024	CHARLES CITY WATER TREATMENT PLANT	Floyd	2	CEDAR R. ABOVE THE SHELLROCK R.	1	PRIMARY TREATMENT						
899	5625106	0059978	11/30/2025	CLIMAX MOLYBDENUM COMPANY	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	3	PRIMARY TREATMENT	93	15.6	0.15	0.375		
900	8816000	0078514	5/31/2027	CRESTON CITY WATER TREATMENT PLANT	Union	4	GRAND R.	1	PRIMARY TREATMENT				0.457		
901	9000101	0060909	4/30/2023	IPL - OTTUMWA GENERATING STATION	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	PRIMARY TREATMENT						
902	6200904	0074659	4/30/2027	LYNNDANA SEWER DISTRICT	Mahaska	5	SKUNK R. ABOVE THE NORTH SKUNK	1	PRIMARY TREATMENT	69	11.6	0.0046	0.0051		
903	6469000	0075345	12/31/2023	MARSHALLTOWN WATER TREATMENT PLANT	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	PRIMARY TREATMENT						
904	7800100	0004391	6/30/2024	NORTHERN NATURAL GAS CO. OAKLAND STATION	Pottawattamie	4	WEST NISHNABOTNA R.	1	PRIMARY TREATMENT						
905	7856000	0081523	11/30/2019	OAKLAND CITY OF WTP	Pottawattamie	4	WEST NISHNABOTNA R.	1	PRIMARY TREATMENT			0.0057	0.0057		
906	2038003	0082953	6/30/2025	OSCEOLA CITY OF WTP	Clarke	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	PRIMARY TREATMENT						
907	9800112	0078042	2/28/2027	POET BIOREFINING - HANLONTOWN, LLC	Worth	2	WINNEBAGO R.	1	PRIMARY TREATMENT						
908	3655000	0079995	12/31/2022	RIVERTON WATER TREATMENT PLANT	Fremont	4	EAST NISHNABOTNA R.	1	PRIMARY TREATMENT						
909	8486000	0079383	4/30/2023	Sioux Center WTP	Sioux	3	FLOYD R.	1	PRIMARY TREATMENT						
910	5225105	0071919	6/30/2023	UNIVERSITY OF IOWA WATER TREATMENT PLANT	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	PRIMARY TREATMENT			0.046	0.046		
911	0407003	0027472	11/30/2023	CENTERVILLE CITY OF STP (EAST)	Appanoose	5	CHARITON R.	1	ROTATING BIOLOGICAL	10425	1741	1.15	1.5	WW	III
912	0407004	0027464	11/30/2023	CENTERVILLE CITY OF STP (WEST)	Appanoose	5	CHARITON R.	1	ROTATING BIOLOGICAL	4383	732	0.18	0.41	WW	II
913	7428002	0021580	10/31/2025	EMMETSBURG CITY OF STP	Palo Alto	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	ROTATING BIOLOGICAL	6886	1150	0.62	1.5	WW	III
914	9525001	0021563	4/30/2025	FOREST CITY CITY OF STP	Winnebago	2	WINNEBAGO R.	1	ROTATING BIOLOGICAL	8982	1500	0.53	1.65	WW	III
915	6525001	0021946	10/31/2024	GMU WASTEWATER TREATMENT FACILITY	Mills	4	KEG AND WAUBONSIE CR.S	1	ROTATING BIOLOGICAL	16240	2712	1.256	1.43	WW	III
916	8335002	0021342	1/31/2024	HARLAN CITY OF STP	Shelby	4	WEST NISHNABOTNA R.	1	ROTATING BIOLOGICAL	9281	1550	0.657	1.777	WW	III
917	4728001	0020761	4/30/2026	IDA GROVE CITY OF STP	Ida	3	MAPLE R.	1	ROTATING BIOLOGICAL	4976	831	0.29	0.39	WW	II
918	8150001	0033090	5/31/2026	SAC CITY, CITY OF STP	Sac	3	NORTH RACCOON R.	1	ROTATING BIOLOGICAL	2731	456	0.354	0.7	WW	II
919	7165001	0032522	6/30/2025	SANBORN CITY OF STP	O'Brien	3	FLOYD R.	2	ROTATING BIOLOGICAL	24850	4150	0.471	0.983	WW	III
920	2171004	0021059	2/29/2024	SPENCER, CITY OF STP	Clay	3	LITTLE SIOUX R.	2	ROTATING BIOLOGICAL	33084	5525	1.95	3.7	WW	III

921	4063001	0036625	9/30/2026	WEBSTER CITY, CITY OF STP	Hamilton	2	BOONE R.	1	ROTATING BIOLOGICAL	24850	4150	1.5	3.3	WW	III
922	9200201	0074080	9/20/2006	AINSWORTH FOUR CORNERS	Washington	6	IOWA R. BELOW NORTH LIBERTY	1	SEPTIC TANK SAND	102	17	0.0075	0.0075		
923	3100401	0075621	5/31/2025	ALBRECHT ACRES CAMPGROUND-STP	Dubuque	1	LITTLE MAQUOKETA R.	1	SEPTIC TANK SAND	42	7	0.0035	0.0035		
924	5603001	0082406	10/31/2020	ARGYLE, CITY OF STP	Lee	6	DES MOINES R. BELOW WHITEBREAST CR.	1	SEPTIC TANK SAND	117	19.6	0.005	0.01		
925	3103001	0076911	9/30/2024	BALLTOWN, CITY OF-NORTH WWTF	Dubuque	1	LITTLE MAQUOKETA R.	1	SEPTIC TANK SAND	78	13	0.006	0.0064	WW	W
926	3103002	0076929	9/30/2024	BALLTOWN, CITY OF-SOUTH WWTF	Dubuque	1	LITTLE MAQUOKETA R.	1	SEPTIC TANK SAND	36	6	0.003	0.0032	WW	W
927	3109001	0071731	9/20/2009	BANKSTON CITY OF STP	Dubuque	1	LITTLE MAQUOKETA R.	1	SEPTIC TANK SAND	62	10	0.004	0.004	WW	W
928	5400401	0077224	2/17/2008	BELVA DEER PARK	Keokuk	6	NORTH SKUNK R.	1	SEPTIC TANK SAND	36	6	0.0032	0.0032		
929	9709001	0071510	2/28/2023	BRONSON CITY OF STP	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	SEPTIC TANK SAND	419	70	0.03	0.033		
930	2200401	0079839	2/29/2024	CAMP EWALU	Clayton	1	MAQUOKETA R.	1	SEPTIC TANK SAND	131	22	0.012	0.013		
931	0800403	0073806	7/31/2022	CAMP HANTESA STP (CAMP FIRE)	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	SEPTIC TANK SAND	62	10	0.005	0.005		
932	8900901	0076741	8/31/2026	CENTER VILLAGE CARE FACILITY-STP	Van Buren	6	DES MOINES R. BELOW WHITEBREAST CR.	1	SEPTIC TANK SAND	61	10.2	0.0054	0.0068		
933	2900109	0074969	9/26/2009	CNH AMERICA LLC BURLINGTON PROVING GROUNDS	Des Moines	6	FLINT R.	1	SEPTIC TANK SAND						
934	5280301	0077992	1/31/2025	CORRIDOR RIDGE SUBDIVISION-SHUEYVILLE	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	SEPTIC TANK SAND	171	29	0.0168	0.0168		
935	2800904	0075876	11/6/2006	DNR BACKBONE STATE PARK (CABINS & SPILLWAY)	Delaware	1	MAQUOKETA R.	1	SEPTIC TANK SAND	89	14.8	0.007	0.0089		
936	4800401	0075213	7/31/2026	EAST IOWA BIBLE CAMP-STP	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	SEPTIC TANK SAND	60	10	0.0004	0.0065		
937	5100201	0075906	12/31/2024	FAIRFIELD BUSINESS & IT PARK	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	1	SEPTIC TANK SAND	48	8	0.004	0.004		
938	9600302	0075442	1/31/2027	FESTINA-WINNESHIEK COUNTY-STP	Winneshiek	1	TURKEY R.	1	SEPTIC TANK SAND	102	17	0.01	0.01	WW	W
939	8500600	0067814	1/31/2025	HICKORY GROVE COURT, LLC	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	2	SEPTIC TANK SAND	66	11	0.0069	0.0069		
940	5600301	0076970	2/10/2007	HIDDEN OAKS ESTATES SUBDIVISION-STP	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	SEPTIC TANK SAND	54	9	0.0051	0.0051		
941	5600118	0052166	2/28/2026	IOWA FERTILIZER COMPANY	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	2	SEPTIC TANK SAND	30	5	0.0028	0.0028		
942	2900101	0001783	4/30/2020	IPL - BURLINGTON GENERATING STATION	Des Moines	6	FLINT R.	1	SEPTIC TANK SAND	12	2	0.001	0.0025		
943	5159001	0078417	11/22/2009	MAHARISHI VEDIC CITY	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	1	SEPTIC TANK SAND	509	85	0.05	0.05	WW	W
944	1150001	0067652	9/30/2025	MARATHON CITY OF STP	Buena Vista	3	NORTH RACCOON R.	1	SEPTIC TANK SAND	461	77	0.042	0.042	WW	W
945	8958001	0076651	12/31/2026	MOUNT STERLING, CITY OF STP	Van Buren	6	FOX AND WYACONDA R.S	1	SEPTIC TANK SAND	54	9	0.0039	0.0053	WW	W
946	7705500	0063321	5/31/2027	NORTH POLK COMMUNITY SCHOOL DISTRICT	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	2	SEPTIC TANK SAND	479	80	0.016	0.016		
947	5500501	0078115	12/31/2026	NORTH UNION COMMUNITY SCHOOL DISTRICT	Kossuth	2	EAST FORK DES MOINES R.	1	SEPTIC TANK SAND	83	13.8	0.0055	0.0055		
948	8600402	0074977	11/30/2017	PILGRIM HEIGHTS RETREAT CENTER-STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	SEPTIC TANK SAND	80	14		0.008		
949	7900208	0078018	8/31/2022	PLEASANT STAY INN & SUITES	Poweshiek	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	SEPTIC TANK SAND	60	10	0.005	0.005		
950	3361001	0076660	6/30/2024	RANDALIA CITY OF STP	Fayette	1	TURKEY R.	1	SEPTIC TANK SAND	89	15	0.008	0.009	WW	W
951	2441001	0042927	7/31/2023	RICKETTS CITY OF STP	Crawford	4	SOLDIER R.	1	SEPTIC TANK SAND	102	17	0.0143	0.0143	WW	W
952	1374001	0033715	3/31/2028	RINARD CITY OF STP	Calhoun	3	NORTH RACCOON R.	1	SEPTIC TANK SAND	12	2	0.004	0.006	WW	W
953	7048301	0077453	12/31/2025	RIVERVIEW SUBDIVISION	Muscatine	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	SEPTIC TANK SAND	59	9.9	0.005	0.0058		
954	2277002	0071072	12/31/2026	SAINT OLAF CITY OF STP	Clayton	1	TURKEY R.	2	SEPTIC TANK SAND	153	25.5	0.006	0.015	WW	W
955	5200405	0052791	9/30/2026	SCALES POINTE CAMPGROUND & MARINA	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	SEPTIC TANK SAND	24	4	0.0021	0.0021		
956	2383001	0076996	10/31/2023	TORONTO, CITY OF-STP	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	1	SEPTIC TANK SAND	154	25.8	0.0152	0.0167	WW	W
957	1182001	0079782	3/2/2013	TRUESDALE, CITY OF STP	Buena Vista	3	NORTH RACCOON R.	2	SEPTIC TANK SAND	96	16	0.0068	0.0091	WW	W
958	2300401	0080799	11/30/2024	WAPSI CENTER CAMP DORMITORY	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	1	SEPTIC TANK SAND	51	8.5	0.0017	0.0017		
959	9200302	0077089	12/31/2025	WATER'S EDGE SUBDIVISION - WWTF	Washington	6	SKUNK R. BELOW THE NORTH SKUNK	1	SEPTIC TANK SAND	100	17	0.0099	0.0099		
960	0692001	0079871	9/30/2025	WATKINS, COMMUNITY OF	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	SEPTIC TANK SAND	134	22.3	0.008	0.013	WW	W
961	2391001	0071196	1/31/2024	WELTON CITY OF STP	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	1	SEPTIC TANK SAND	443	74	0.033	0.033	WW	W
962	4998001	0074209	3/31/2023	ZWINGLE, CITY OF STP	Jackson	1	MAQUOKETA R.	1	SEPTIC TANK SAND	122	20.4	0.012	0.012	WW	W
963	0700201	0082481	12/31/2024	CEDAR VALLEY SUITES	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	SEPTIC TANK WETLAND	87	14.6	0.005	0.005		
964	2133001	0079260	6/30/2021	GREENVILLE, CITY OF STP	Clay	3	LITTLE SIOUX R.	1	SEPTIC TANK WETLAND	157	26	0.0099	0.0099	WW	W
965	7700502	0075531	1/31/2024	IOWA ASSOCIATION OF MUNICIPAL UTILITIES	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	SEPTIC TANK WETLAND	17	3	0.0018	0.0018		
966	2503001	0041921	11/30/2027	ADEL CITY OF STP	Dallas	5	NORTH RACCOON R.	2	SEQUENCING BATCH	11587	1935	0.98	3.4	WW	III
967	8400120	0081621	2/28/2022	AGROPUR INC.	Sioux	3	FLOYD R.	1	SEQUENCING BATCH	56886	9500		0.35		
968	1509001	0029025	10/31/2024	ATLANTIC CITY OF STP	Cass	4	EAST NISHNABOTNA R.	2	SEQUENCING BATCH	11976	2000	0.98	2.65	WW	III
969	7329001	0035190	3/31/2027	CLARINDA CITY OF STP	Page	4	NODAWAY R.	2	SEQUENCING BATCH	18563	3100	0.85	1.6	WW	IV
970	1716901	0058441	10/31/2026	CLEAR LAKE SANITARY DISTRICT	Cerro Gordo	2	WEST FORK CEDAR R.	1	SEQUENCING BATCH	31838	5317	2.4	5.7	WW	IV
971	5722001	0024473	2/29/2028	COGGON CITY OF STP	Linn	1	WAPSIPINICON R. ABOVE ANAMOSA	2	SEQUENCING BATCH	1078	180	0.064	0.158	WW	II
972	1000500	0067393	4/30/2025	CONO RIDGE HAVEN	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	1	SEQUENCING BATCH	421	69	0.025	0.025		
973	3809001	0034355	1/31/2027	CONRAD CITY OF STP	Grundy	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	SEQUENCING BATCH	1916	320	0.2	0.26	WW	II
974	4236001	0025933	7/31/2025	ELDORA CITY OF STP	Hardin	2	IOWA R. ABOVE ALBION	2	SEQUENCING BATCH	7383	1233	0.694	1.515	WW	III
975	8230003	0063231	10/31/2025	ELDRIDGE CITY OF STP (SOUTH SLOPE)	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	SEQUENCING BATCH	16671	2784	1.1	2.4	WW	IV
976	4130002	0036153	2/29/2024	GARNER CITY OF STP	Hancock	2	IOWA R. ABOVE ALBION	2	SEQUENCING BATCH	3563	595	0.343	0.873	WW	III
977	6000201	0083348	3/31/2016	GRAND FALLS CASINO RESORT	Lyon	3	BIG SIOUX R. ABOVE THE ROCK	1	SEQUENCING BATCH	3545	592	0.0464	0.0811		
978	2537001	0041912	10/31/2026	GRANGER CITY OF STP	Dallas	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	2	SEQUENCING BATCH	4210	703	0.384	0.59	WW	III
979	3833001	0024511	8/31/2024	GRUNDY CENTER CITY OF STP	Grundy	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	SEQUENCING BATCH	7784	1300	0.4	1.2	WW	III
980	3544001	0036471	2/28/2027	HAMPTON CITY OF STP	Franklin	2	WEST FORK CEDAR R.	2	SEQUENCING BATCH	11790	1969	0.687	1.374	WW	III
981	2835001	0023469	8/31/2025	HOPKINTON CITY OF STP	Delaware	1	MAQUOKETA R.	1	SEQUENCING BATCH	1425	238	0.071	0.167	WW	II
982	9800802	0084221	3/31/2026	I35-105 INTERCHANGE COMMERCIAL DISTRICT	Worth	2	SHELLROCK R.	1	SEQUENCING BATCH	2994	500	0.09	0.122		
983	0743001	0035963	11/30/2026	LA PORTE CITY, CITY OF STP	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	SEQUENCING BATCH	3593	600	0.26	0.566	WW	III
984	2740001	0036102	5/31/2027	LAMONI CITY OF STP	Decatur	5	GRAND R.	1	SEQUENCING BATCH	2263	378	0.231	0.893	WW	III
985	8245002	0022012	7/31/2023	LECLAIRE CITY OF STP	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	SEQUENCING BATCH	11509	1922	1	1.54	WW	III
986	2742001	0027871	10/31/2024	LEON CITY OF STP	Decatur	5	THOMPSON R.	2	SEQUENCING BATCH	3263	545	0.34	0.98	WW	III
987	5100302	0072699	7/22/2003	Maharishi Vedic City - South	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	1	SEQUENCING BATCH	299	50	0.02	0.02	WW	II
988	6469001	0038610	10/31/2027	MARSHALLTOWN CITY OF WATER POLLUTION CONTROL	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	SEQUENCING BATCH	144174	24077	6.4	13.04	WW	IV
989	2258001	0028614	4/30/2022	MCGREGOR CITY OF STP	Clayton	1	YELLOW R. AND PAINT CR.	1	SEQUENCING BATCH	1629	272	0.086	0.15	WW	II
990	7751001	0021997	2/28/2022	MITCHELLVILLE CITY OF STP	Polk	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	2	SEQUENCING BATCH	6006	1003	0.387	1.69	WW	III
991	8055001	0023574	1/31/2024	MOUNT AYR CITY OF STP	Ringgold	4	GRAND R.	1	SEQUENCING BATCH	7192	1201	0.39	0.78	WW	III
992	4453001	0047970	5/31/2024	MOUNT PLEASANT CITY OF STP (MAIN)	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	1	SEQUENCING BATCH	14671	2450	1.35	2.75	WW	III
993	5700104	0003727	2/28/2027	NEXTERA ENERGY DUANE ARNOLD, LLC	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	SEQUENCING BATCH	560	93	0.054	0.054		
994	5252001	0032905	10/31/2025	NORTH LIBERTY CITY OF STP	Johnson	6	IOWA R. BELOW NORTH LIBERTY	2	SEQUENCING BATCH	28323	4730	2.93	4.429	WW	IV
995	3353001	0032344	5/31/2026	OELWEIN CITY OF STP	Fayette	1	WAPSIPINICON R. ABOVE ANAMOSA	1	SEQUENCING BATCH	16431	2744	1.07	2.66	WW	IV
996	7856100	0065111	5/31/2024	OSI INDUSTRIES, LLC	Pottawattamie	4	WEST NISHNABOTNA R.	2	SEQUENCING BATCH	95210	15900	0.491	0.78		
997	5260001	0032531	12/31/2025	OXFORD CITY OF STP	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	SEQUENCING BATCH	1018	170	0.096	0.239	WW	II

998	6377001	0035921	8/31/2027	PLEASANTVILLE CITY OF STP	Marion	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	2	SEQUENCING BATCH	2144	358	0.26	0.87	WW	III
999	5064001	0033073	6/30/2024	PRAIRIE CITY, CITY OF STP	Jasper	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	2	SEQUENCING BATCH	3228	539	0.31	0.78	WW	III
1000	3870001	0033308	8/31/2024	REINBECK, CITY OF STP	Grundy	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	SEQUENCING BATCH	2778	464	0.306	0.728	WW	III
1001	9260001	0047945	6/30/2026	RIVERSIDE CITY OF STP	Washington	6	IOWA R. BELOW NORTH LIBERTY	2	SEQUENCING BATCH	8713	1455	0.444	0.654	WW	III
1002	8482001	0033057	9/30/2027	ROCK VALLEY CITY OF STP	Sioux	3	ROCK R.	2	SEQUENCING BATCH	5587	933	0.653	0.753	WW	III
1003	1376001	0033138	12/31/2027	ROCKWELL CITY, CITY OF STP	Calhoun	3	NORTH RACCOON R.	2	SEQUENCING BATCH	2341	391	0.35	1.114	WW	III
1004	4975001	0032867	3/31/2024	SABULA CITY OF STP	Jackson	1	MISSISSIPPI R. NEAR SABULA	1	SEQUENCING BATCH	1665	278	0.1308	0.2073	WW	II
1005	7170001	0032662	3/31/2026	SHELDON CITY OF STP	O'Brien	3	FLOYD R.	2	SEQUENCING BATCH	14970	2500	1.438	3.025	WW	III
1006	8584001	0035882	7/31/2024	STORY CITY CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	SEQUENCING BATCH	5988	1000	0.414	0.948	WW	III
1007	9271001	0032433	9/30/2026	WASHINGTON CITY OF STP	Washington	6	SKUNK R. BELOW THE NORTH SKUNK	2	SEQUENCING BATCH	19437	3246	1.6	6.24	WW	IV
1008	0105001	0035416	2/9/2008	ADAIR CITY OF STP	Adair	4	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	TRICKLING FILTER	874	146	0.08	0.33	WW	II
1009	3900501	0067156	9/30/2022	ADAIR-CASEY COMMUNITY SCHOOL DISTRICT	Guthrie	4	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	2	TRICKLING FILTER	120	20	0.0039	0.0039		
1010	5502001	0022055	2/29/2028	ALGONA CITY OF STP	Kossuth	2	EAST FORK DES MOINES R.	2	TRICKLING FILTER	26946	4500	1.32	2.6	WW	III
1011	8503001	0035955	2/28/2027	AMES WATER POLLUTION CONTROL FACILITY	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	TRICKLING FILTER	96707	16150	8.6	12.1	WW	IV
1012	7103001	0082422	10/31/2026	ARCHER CITY OF STP	O'Brien	3	LITTLE SIOUX R.	1	TRICKLING FILTER	143	24	0.0106	0.014	WW	II
1013	8709001	0026018	1/31/2027	BEDFORD CITY OF STP	Taylor	4	HUNDRED AND TWO	1	TRICKLING FILTER	1772	296	0.192	0.589	WW	II
1014	9110001	0081418	5/31/2026	BEVINGTON CITY OF STP	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	2	TRICKLING FILTER	325	54.21	0.0079	0.0099	WW	II
1015	4103001	0023582	8/31/2026	BRITT CITY OF STP	Hancock	2	BOONE R.	2	TRICKLING FILTER	3862	645	0.53	0.9	WW	II
1016	5300802	0071820	2/29/2024	CAMP COURAGEOUS OF IOWA	Jones	1	MAQUOKETA R.	2	TRICKLING FILTER	365	61	0.01	0.015		
1017	7809001	0042901	12/31/2026	CARSON CITY OF STP	Pottawattamie	4	WEST NISHNABOTNA R.	2	TRICKLING FILTER	880	147	0.065	0.161	WW	II
1018	0709001	0036633	7/31/2024	CEDAR FALLS CITY OF STP	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	TRICKLING FILTER	45928	7670	7.68	8.8	WW	III
1019	8400124	0053315	4/30/2026	CENTER FRESH EGG FARM - DOMESTIC WASTEWATER	Sioux	3	BIG SIOUX R. BELOW THE ROCK	1	TRICKLING FILTER	180	30	0.003	0.003		
1020	5009001	0041980	3/31/2025	COLFAX CITY OF STP	Jasper	5	SKUNK R. ABOVE THE NORTH SKUNK	1	TRICKLING FILTER	2754	460	0.325	0.685	WW	II
1021	5200801	0068331	9/30/2027	COTTAGE RESERVE CORPORATION	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	TRICKLING FILTER	222	37	0.022	0.022		
1022	7820001	0036641	11/30/2025	COUNCIL BLUFFS CITY OF STP	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	TRICKLING FILTER	186228	31100	6.5	14	WW	IV
1023	0600601	0077330	1/31/2026	COUNTRY AIRE TRAILER COURT-STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	TRICKLING FILTER	102	17	0.003	0.005		
1024	8816001	0035238	12/31/2025	CRESTON CITY OF STP	Union	4	PLATTE R.	1	TRICKLING FILTER	17964	3000	1.1	3.6	WW	III
1025	2529001	0056821	3/31/2025	DESOTO CITY OF STP	Dallas	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	2	TRICKLING FILTER	1359	227	0.09	0.63	WW	II
1026	3215001	0082147	10/31/2025	DOLLIVER, CITY OF STP	Emmet	3	EAST FORK DES MOINES R.	1	TRICKLING FILTER	81	13.6	0.006	0.008	WW	II
1027	2825001	0042773	4/30/2025	EARLVILLE CITY OF STP	Delaware	1	MAQUOKETA R.	1	TRICKLING FILTER	970	162	0.075	0.085	WW	II
1028	3218002	0023744	12/31/2025	ESTHERVILLE CITY OF STP	Emmet	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	TRICKLING FILTER	80838	13500	2	3.5	WW	IV
1029	4715001	0056537	6/30/2026	GALVA CITY OF STP	Ida	3	MAPLE R.	1	TRICKLING FILTER	431	72	0.035	0.074	WW	II
1030	0140001	0021369	9/30/2019	GREENFIELD CITY OF STP	Adair	4	THOMPSON R.	1	TRICKLING FILTER	2910	486	0.311	1.08	WW	II
1031	9200501	0070084	8/31/2022	HIGHLAND COMMUNITY SCHOOL	Washington	6	IOWA R. BELOW NORTH LIBERTY	1	TRICKLING FILTER	30	5	0.0024	0.0032		
1032	1037001	0036510	9/30/2025	INDEPENDENCE CITY OF STP	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	1	TRICKLING FILTER	49646	8291	1.8	4	WW	III
1033	2900900	0022144	1/31/2025	IOWA ARMY AMMUNITION PLANT	Des Moines	6	SKUNK R. BELOW THE NORTH SKUNK	1	TRICKLING FILTER						
1034	4260001	0023442	8/31/2025	IOWA FALLS CITY OF STP	Hardin	2	IOWA R. ABOVE ALBION	2	TRICKLING FILTER	16766	2800	1.14	2.625	WW	III
1035	3100602	0071811	9/30/2022	KNAPP MOBILE HOME PARK-STP	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	TRICKLING FILTER	126	21	0.0063	0.0063		
1036	6342001	0035866	7/31/2025	KNOXVILLE CITY OF STP	Marion	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	TRICKLING FILTER	17719	2959	1.355	3.07	WW	III
1037	4800207	0053388	3/31/2027	KUM & GO #1443 WILLIAMSBURG	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	TRICKLING FILTER	80	13.3	0.0012	0.0025	WW	II
1038	3100608	0063827	7/30/2007	LOST CANYON MOBILE HOME PARK	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	TRICKLING FILTER	150	25	0.015	0.015		
1039	1457001	0023337	8/31/2022	MANNING CITY OF STP	Carroll	4	WEST NISHNABOTNA R.	1	TRICKLING FILTER	2713	453	0.19	0.4	WW	II
1040	1461001	0081639	7/31/2026	MAPLE RIVER JUNCTION STP	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	TRICKLING FILTER	114	19	0.006	0.0113	WW	II
1041	5343001	0026034	12/31/2027	MONTICELLO CITY OF STP	Jones	1	MAQUOKETA R.	1	TRICKLING FILTER	6467	1080	0.54	1.14	WW	III
1042	4455001	0082881	7/31/2022	MOUNT UNION CITY OF (RUSS)	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	1	TRICKLING FILTER	153	26	0.015	0.015	WW	II
1043	8562001	0031704	1/31/2027	NEVADA CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	2	TRICKLING FILTER	29168	4871	1.658	3.71	WW	III
1044	0370001	0026611	4/30/2028	NEW ALBIN CITY OF STP	Allamakee	1	YELLOW R. AND PAINT CR.	1	TRICKLING FILTER	1437	240	0.105	0.123	WW	II
1045	1970001	0028525	5/31/2024	NEW HAMPTON CITY OF STP	Chickasaw	1	WAPSIPINICON R. ABOVE ANAMOSA	1	TRICKLING FILTER	73653	12300	1.32	2.2	WW	IV
1046	4858001	0034282	9/30/2021	NORTH ENGLISH CITY OF STP	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	TRICKLING FILTER	1101	184	0.054	0.242	WW	II
1047	3100611	0066290	11/30/2025	NORTHEND MOBILE HOME PARK	Dubuque	1	LITTLE MAQUOKETA R.	1	TRICKLING FILTER	93	16	0.015	0.015		
1048	0656001	0036943	6/30/2025	NORWAY CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	TRICKLING FILTER	1650	275.58	0.0724	0.2728	WW	II
1049	6739001	0036145	4/27/2008	ONAWA CITY OF STP	Monona	4	WEST FORK LITTLE SIOUX R.	1	TRICKLING FILTER	3233	540	0.268	0.568	WW	II
1050	2038002	0041815	3/31/2026	OSCEOLA CITY OF STP	Clarke	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	TRICKLING FILTER	24329	4063	1.065	2.648	WW	III
1051	6273001	0038539	3/31/2026	OSKALOOSA CITY OF STP (NORTHEAST)	Mahaska	5	SKUNK R. ABOVE THE NORTH SKUNK	1	TRICKLING FILTER	8814	1472	0.904	2.5	WW	III
1052	6950001	0040266	8/31/2024	RED OAK CITY OF STP	Montgomery	4	EAST NISHNABOTNA R.	1	TRICKLING FILTER	11976	2000	0.84	2.7	WW	III
1053	6065001	0032786	6/30/2026	ROCK RAPIDS CITY OF STP	Lyon	3	ROCK R.	1	TRICKLING FILTER	2934	490	0.295	0.502	WW	II
1054	3659001	0032328	1/31/2027	SHENANDOAH CITY OF STP	Fremont	4	EAST NISHNABOTNA R.	1	TRICKLING FILTER	8683	1450	0.867	1.88	WW	III
1055	0398001	0033081	9/30/2021	WAUKON CITY OF STP	Allamakee	1	YELLOW R. AND PAINT CR.	1	TRICKLING FILTER	9287	1624	0.79	1.652	WW	III
1056	0990001	0033197	7/31/2025	WAVERLY CITY OF STP	Bremer	1	CEDAR R. ABOVE THE SHELLROCK R.	1	TRICKLING FILTER	16120	2692	0.968	2.33	WW	III
1057	3383003	0035378	2/29/2020	WEST UNION CITY OF STP	Fayette	1	TURKEY R.	1	TRICKLING FILTER	7449	1244	0.5	0.85	WW	III
1058	2394001	0058912	9/30/2024	WHEATLAND CITY OF STP	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	2	TRICKLING FILTER	904	151	0.104	0.277	WW	II
1059	6171001	0034291	12/31/2024	WINTERSET CITY OF STP	Madison	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	TRICKLING FILTER	4790	800	0.5	1.75	WW	II
1060	5700401	0070050	2/28/2023	YMCA CAMP WAPSIE STP	Linn	1	WAPSIPINICON R. ABOVE ANAMOSA	2	TRICKLING FILTER	305	51	0.0225	0.0225		
1061	8803001	0041831	6/30/2027	AFTON CITY OF STP	Union	4	THOMPSON R.	1	WASTE STABILIZATION	1030	172	0.07	0.171	WL	IL
1062	9203001	0069183	4/30/2027	AINSWORTH CITY OF STP	Washington	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	635	106	0.038	0.06	WL	IL
1063	7509001	0035211	5/31/2022	AKRON CITY OF STP	Plymouth	3	BIG SIOUX R. BELOW THE ROCK	1	WASTE STABILIZATION	2216	370	0.131	0.217	WL	IL
1064	5704001	0024431	1/31/2025	ALBURNETT CITY OF STP	Linn	1	CEDAR R. BELOW CEDAR RAPIDS	1	WASTE STABILIZATION	953	159		0.085	WL	IL
1065	4213001	0034339	2/28/2025	ALDEN CITY OF STP	Hardin	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	1389	232	0.103	0.2	WL	IL
1066	0300901	0065790	4/30/2026	ALLAMAKEE COUNTY PUBLIC SAFETY CENTER STP	Allamakee	1	UPPER IOWA R.	1	WASTE STABILIZATION	102	17	0.01	0.01		
1067	9303003	0054054	8/31/2026	ALLERTON CITY OF STP (NORTH)	Wayne	5	CHARITON R.	1	WASTE STABILIZATION	171	29		0.02	WL	IL
1068	1203001	0042731	1/31/2025	ALLISON CITY OF STP	Butler	2	WEST FORK CEDAR R.	1	WASTE STABILIZATION	1527	255	0.075	0.2	WL	IL
1069	1903001	0030686	8/31/2024	ALTA VISTA CITY OF STP	Chickasaw	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	389	65	0.032	0.06	WL	IL
1070	8403001	0028932	12/31/2023	ALTON CITY OF STP	Sioux	3	FLOYD R.	1	WASTE STABILIZATION	2096	350	0.12	0.241	WL	IL
1071	6003001	0059722	11/30/2019	ALVORD CITY OF STP	Lyon	3	ROCK R.	1	WASTE STABILIZATION	269	45	0.015	0.025	WL	IL
1072	4802901	0059161	7/31/2021	AMANA SANITARY DISTRICT	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	3119	521		0.158	WL	IL
1073	8300100	0073920	7/10/2024	AMPC, INC. dba ESSENTIA PROTEINS SOLUTIONS - LAOP	Shelby	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	8982	1500	0.15	0.15		
1074	2307001	0021091	11/30/2023	ANDOVER CITY OF STP	Clinton	6	MISSISSIPPI R. NEAR SABULA	1	WASTE STABILIZATION	108	18		0.012	WL	IL

1075	4903001	0057975	8/31/2016	ANDREW CITY OF STP	Jackson	1	MAQUOKETA R.	1	WASTE STABILIZATION	952	159		0.079	WL	IL
1076	9704001	0042854	9/30/2027	ANTHON CITY OF STP	Woodbury	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	647	108	0.06	0.127	WL	IL
1077	1403001	0031208	12/31/2022	ARCADIA CITY OF STP	Carroll	4	BOYER R.	1	WASTE STABILIZATION	566	95	0.0526	0.0526	WL	IL
1078	8809001	0074462	4/30/2016	ARISPE, CITY OF STP	Union	4	GRAND R.	1	WASTE STABILIZATION	89	15		0.0087	WL	IL
1079	3307001	0027383	11/30/2023	ARLINGTON CITY OF STP	Fayette	1	TURKEY R.	1	WASTE STABILIZATION	677	113	0.061	0.075	WL	IL
1080	4703001	0025887	6/30/2025	ARTHUR CITY OF STP	Ida	3	LITTLE SIOUX R.	2	WASTE STABILIZATION	210	35		0.0484	WL	IL
1081	7209001	0024457	3/31/2023	ASHTON CITY OF STP	Osceola	3	ROCK R.	1	WASTE STABILIZATION	629	105		0.0449	WL	IL
1082	8271801	0076805	11/30/2022	ASPIRE PLEASANT VALLEY	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	WASTE STABILIZATION	89	14.88		0.0081		
1083	8104001	0057029	10/31/2026	AUBURN CITY OF STP	Sac	3	NORTH RACCOON R.	2	WASTE STABILIZATION	449	75	0.022	0.04	WL	IL
1084	1803001	0028908	7/31/2026	AURELIA CITY OF STP	Cherokee	3	MAPLE R.	1	WASTE STABILIZATION	1222	204	0.12	0.21	WL	IL
1085	1003001	0059412	3/31/2028	AURORA CITY OF STP	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	329	55		0.032	WL	IL
1086	6809001	0074713	1/31/2025	AVERY, CITY OF STP-(RATHBUN RWA)	Monroe	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	126	21.1		0.0124	WL	IL
1087	7803001	0030708	5/31/2025	AVOCA CITY OF STP	Pottawattamie	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	1677	280	0.124	0.165	WL	IL
1088	7403001	0079677	7/31/2021	AYRSHIRE, CITY OF STP	Palo Alto	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	WASTE STABILIZATION	204	34	0.0175	0.0202	WL	IL
1089	9405001	0029041	1/31/2028	BADGER CITY OF STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	844	141	0.096	0.109	WL	IL
1090	4907001	0063398	5/31/2026	BALDWIN-MONMOUTH WW TREATMENT AGENCY	Jackson	1	MAQUOKETA R.	1	WASTE STABILIZATION	605	101		0.053	WL	IL
1091	5507002	0057762	2/28/2025	BANCROFT CITY OF STP	Kossuth	2	EAST FORK DES MOINES R.	2	WASTE STABILIZATION	743	124		0.17	WL	IL
1092	7905001	0081329	1/31/2024	BARNES CITY, CITY OF STP	Poweshiek	5	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	205	34.2	0.021	0.021	WL	IL
1093	9408001	0041246	1/31/2025	BARNUM CITY OF STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	280	46.8		0.038	WL	IL
1094	5107001	0061778	1/31/2021	BATAVIA CITY OF STP	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	581	97		0.0556	WL	IL
1095	4709001	0027855	2/28/2026	BATTLE CREEK CITY OF STP	Ida	3	MAPLE R.	1	WASTE STABILIZATION	868	145	0.068	0.0796	WL	IL
1096	5003001	0023353	4/30/2027	BAXTER CITY OF STP	Jasper	5	SKUNK R. ABOVE THE NORTH SKUNK	2	WASTE STABILIZATION	1575	263	0.178	0.319	WL	IL
1097	4800105	0052268	4/30/2025	BAYER PRODUCTION SUPPLY LLC	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	317	53	0.0036	0.0171		
1098	3803001	0058734	6/30/2016	BEAMAN CITY OF STP	Grundy	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	WASTE STABILIZATION	347	58		0.0348	WL	IL
1099	1603001	0021971	7/31/2025	BENNETT CITY OF STP	Cedar	6	CEDAR R. BELOW CEDAR RAPIDS	1	WASTE STABILIZATION	613	102		0.06	WL	IL
1100	3113001	0076856	5/31/2024	BERNARD, CITY OF-STP	Dubuque	1	MAQUOKETA R.	1	WASTE STABILIZATION	191	32	0.018	0.018	WL	IL
1101	5200403	0069094	10/31/2022	BEYONDER GETAWAY AT SLEEPY HOLLOW	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	138	23		0.008		
1102	4003001	0034347	4/30/2025	BLAIRSBURG CITY OF STP	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	404	68		0.045	WL	IL
1103	6827001	0028215	9/30/2019	BLAKESBURG CITY OF STP	Monroe	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	564	94.15		0.0482	WL	IL
1104	6709001	0042889	12/31/2016	BLENCOE CITY OF STP	Monona	4	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	WASTE STABILIZATION	265	44	0.018	0.045	WL	IL
1105	8714001	0076023	10/31/2026	BLOCKTON CITY OF (SOUTHERN IA RURAL WATER ASSN.)	Taylor	4	PLATTE R.	1	WASTE STABILIZATION	210	35		0.022	WL	IL
1106	4609001	0047805	4/30/2024	BODE CITY OF STP	Humboldt	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	489	81.6	0.0309	0.0379	WL	IL
1107	8914001	0050628	7/31/2027	BONAPARTE CITY OF STP	Van Buren	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	550	92		0.055	WL	IL
1108	0825001	0058491	7/31/2017	BOXHOLM CITY OF STP	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	329	55	0.033	0.033	WL	IL
1109	7324001	0057151	6/30/2025	BRADDYVILLE CITY OF STP	Page	4	EAST NODAWAY R.	1	WASTE STABILIZATION	263	44		0.026	WL	IL
1110	0510001	0057100	7/31/2026	BRAYTON CITY OF STP	Audubon	4	EAST NISHNABOTNA R.	1	WASTE STABILIZATION	275	46		0.0275	WL	IL
1111	1409002	0056103	6/30/2023	BREDA CITY OF STP	Carroll	4	NORTH RACCOON R.	1	WASTE STABILIZATION	646	107.9	0.082	0.1225	WL	IL
1112	0115001	0062006	5/31/2025	BRIDGEWATER CITY OF (SIRWA)	Adair	4	NODAWAY R.	1	WASTE STABILIZATION	283	47.2		0.0261	WL	IL
1113	7514001	0058564	4/30/2018	BRUNSVILLE CITY OF STP	Plymouth	3	FLOYD R.	1	WASTE STABILIZATION	204	34	0.0198	0.0278	WL	IL
1114	5600606	0057525	6/30/2017	BRYANT'S MHP (now L & R Estates LLC)	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	WASTE STABILIZATION	27	5		0.0018		
1115	9506001	0047821	5/31/2016	BUFFALO CENTER CITY OF STP	Winnebago	2	BLUE EARTH R.	1	WASTE STABILIZATION	1521	254		0.1654	WL	IL
1116	5510001	0027405	10/31/2023	BURT CITY OF STP	Kossuth	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	586	97.8	0.076	0.115	WL	IL
1117	6309001	0072991	7/31/2025	BUSSEY CITY OF STP	Marion	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	659	110		0.065	WL	IL
1118	2320001	0028622	12/31/2022	CALAMUS CITY OF STP	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	2	WASTE STABILIZATION	599	100	0.037	0.067	WL	IL
1119	9417001	0057096	1/31/2022	CALLENDER CITY OF STP	Webster	2	NORTH RACCOON R.	1	WASTE STABILIZATION	407	68	0.045	0.147	WL	IL
1120	7109001	0062049	9/30/2016	CALUMET CITY OF STP	O'Brien	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	259	43	0.0245	0.0245	WL	IL
1121	5100105	0079707	2/28/2025	CAMBRIDGE INVESTMENT RESEARCH INC.	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	2	WASTE STABILIZATION	150	25		0.0083		
1122	8920001	0056685	11/30/2015	CANTRIL CITY OF STP	Van Buren	6	FOX AND WYACONDA R.S	2	WASTE STABILIZATION	281	47	0.022	0.033	WL	IL
1123	5700601	0065609	2/28/2026	CARLTON MOBILE HOME COURT	Linn	1	CEDAR R. BELOW CEDAR RAPIDS	1	WASTE STABILIZATION	72	12	0.005	0.005		
1124	6616001	0081566	1/31/2024	CARPENTER CITY OF STP	Mitchell	2	CEDAR R. ABOVE THE SHELLROCK R.	1	WASTE STABILIZATION	132	22	0.013	0.013	WL	IL
1125	9620001	0076236	2/28/2015	CASTALIA CITY OF STP	Winneshiek	1	YELLOW R. AND PAINT CR.	1	WASTE STABILIZATION	222	37	0.019	0.019	WL	IL
1126	0709600	0064033	1/31/2026	CEDAR FALLS MOBILE HOME VILLAGE	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	WASTE STABILIZATION	240	40		0.032		
1127	3800600	0061689	11/30/2024	CEDAR GLEN MHC LLC	Grundy	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	WASTE STABILIZATION	204	34	0.015	0.029		
1128	5315001	0080357	12/31/2024	CENTER JUNCTION, CITY OF STP	Jones	1	MAQUOKETA R.	1	WASTE STABILIZATION	175	29	0.0112	0.0148	WL	IL
1129	2324001	0062341	1/31/2025	CHARLOTTE CITY OF STP	Clinton	6	MAQUOKETA R.	1	WASTE STABILIZATION	892	149	0.076	0.076	WL	IL
1130	2417001	0022268	2/29/2024	CHARTER OAK CITY OF STP	Crawford	4	SOLDIER R.	1	WASTE STABILIZATION	719	120		0.0576	WL	IL
1131	4509001	0020931	6/30/2023	CHESTER CITY OF STP	Howard	1	UPPER IOWA R.	1	WASTE STABILIZATION	204	34		0.02	WL	IL
1132	9032001	0071081	1/31/2016	CHILLICOTHE,CITY OF-(WAPELLO RURAL WATER ASSN).	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	126	21		0.0125	WL	IL
1133	5000400	0068365	1/31/2019	CHRISTIAN CONFERENCE CENTER	Jasper	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	150	25		0.0058		
1134	3709001	0031216	1/31/2024	CHURDAN CITY OF STP	Greene	4	NORTH RACCOON R.	1	WASTE STABILIZATION	701	117		0.032	WL	IL
1135	9420001	0062936	7/31/2025	CLARE CITY OF STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	323	54		0.0311	WL	IL
1136	1630001	0027201	6/30/2026	CLARENCE CITY OF STP	Cedar	6	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	1455	243	0.14	0.2274	WL	IL
1137	1228001	0023388	9/30/2023	CLARKSVILLE CITY OF STP	Butler	2	SHELLROCK R.	1	WASTE STABILIZATION	1527	255		0.15	WL	IL
1138	8012001	0070980	10/31/2024	CLEARFIELD CITY OF STP	Ringgold	4	PLATTE R.	1	WASTE STABILIZATION	459	76		0.0398	WL	IL
1139	1817001	0042846	2/28/2027	CLEGHORN CITY OF STP	Cherokee	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	467	78	0.042	0.0468	WL	IL
1140	6415001	0057509	2/28/2026	CLEMONS CITY OF STP	Marshall	5	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	299	50		0.029	WL	IL
1141	8616001	0056812	2/28/2016	CLUTIER CITY OF STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	352	59		0.029	WL	IL
1142	9400301	0062421	9/30/2024	COATS UTILITY COMPANY (XENIA RURAL WATER)	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	183	31	0.022	0.024		
1143	7335001	0062332	8/31/2027	COIN CITY OF STP	Page	4	TARKIO R.	1	WASTE STABILIZATION	359	60	0.035	0.035	WL	IL
1144	8515001	0047767	7/31/2016	COLLINS CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	2	WASTE STABILIZATION	587	98		0.152	WL	IL
1145	8520001	0047759	3/31/2022	COLO CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	994	166	0.091	0.175	WL	IL
1146	7016001	0058769	9/30/2027	CONESVILLE CITY OF STP	Muscatine	6	IOWA R. BELOW NORTH LIBERTY	2	WASTE STABILIZATION	814	136	0.076	0.097	WL	IL
1147	4807001	0079901	8/31/2021	CONROY, IOWA - POWESHIEK WATER ASSOC	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	212	35	0.0156	0.0208	WL	IL
1148	3927002	0028983	1/31/2024	COON RAPIDS CITY OF STP	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	WASTE STABILIZATION	1545	258	0.153	0.185	WL	IL
1149	0220000	0076759	12/31/2023	CORNING MUNICIPAL UTILITIES WATER TREATMENT PLANT	Adams	4	EAST NODAWAY R.	1	WASTE STABILIZATION						
1150	9721001	0023531	9/30/2026	CORRECTIONVILLE CITY OF STP	Woodbury	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	1078	180	0.106	0.2378	WL	IL
1151	8300901	0066214	2/29/2024	COUNTRY CARE CENTER CORPORATION	Shelby	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	61	10.2		0.006		

1152	5000600	0067717	3/31/2025	COUNTRY CREEK ESTATES	Jasper	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	60	10		0.0045		
1153	8200601	0065471	8/31/2023	COUNTRY ESTATES MOBILE HOME PARK	Scott	6	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	180	30		0.018		
1154	6500602	0082201	11/30/2020	COUNTRY ESTATES MOBILE HOME PARK	Mills	4	PIGEON AND MOSQUITO CR.S	1	WASTE STABILIZATION						
1155	8500601	0068527	3/31/2027	COUNTRY LIVING COURT, LLC	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	99	16.6		0.0069		
1156	4500901	0083461	3/31/2017	COUNTRY WINDS MANOR, INC.	Howard	1	UPPER IOWA R.	1	WASTE STABILIZATION	72	12		0.0068		
1157	7521001	0075850	3/31/2025	CRAIG, CITY OF STP (SOUTHERN SIOUX CO. RURAL WATER	Plymouth	3	FLOYD R.	1	WASTE STABILIZATION	116	19.4	0.01	0.012		
1158	9214001	0076074	1/31/2024	CRAWFORDSVILLE, CITY OF (WAPELLO RURAL WATER ASSN)	Washington	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	341	57	0.032	0.032	WL	IL
1159	7822001	0076431	9/30/2022	CRESCENT CITY OF STP	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	WASTE STABILIZATION	587	98		0.058	WL	IL
1160	4800715	0065480	4/30/2025	CREST COUNTRY INN	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	36	6		0.0021		
1161	8822001	0074063	6/30/2016	CROMWELL, CITY-STP -SIRWA	Union	4	PLATTE R.	1	WASTE STABILIZATION	122	20		0.012	WL	IL
1162	4115001	0062367	6/30/2016	CRYSTAL LAKE CITY OF STP	Hancock	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	322	54	0.033	0.033	WL	IL
1163	1516001	0034363	9/30/2019	CUMBERLAND CITY OF STP	Cass	4	NODAWAY R.	1	WASTE STABILIZATION	317	53		0.041	WL	IL
1164	9725001	0023477	1/31/2025	CUSHING CITY OF STP	Woodbury	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	337	56	0.031	0.031	WL	IL
1165	7414001	0064823	3/31/2023	CYLINDER CITY OF STP	Palo Alto	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	WASTE STABILIZATION	122	20.4	0.012	0.03	WL	IL
1166	9729001	0035246	6/30/2028	DANBURY CITY OF STP	Woodbury	3	MAPLE R.	1	WASTE STABILIZATION	599	100	0.062	0.102	WL	IL
1167	2915001	0025861	11/30/2024	DANVILLE CITY OF STP	Des Moines	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	1222	204	0.13	0.83	WL	IL
1168	8222004	0076261	1/31/2028	DAVENPORT, CITY OF-WEST LOCUST LAGOON	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	WASTE STABILIZATION	240	40	0.024	0.024	WL	IL
1169	2600901	0065846	12/31/2015	DAVIS COUNTY CARE FACILITY	Davis	6	FOX AND WYACONDA R.S	1	WASTE STABILIZATION	70	12		0.0067		
1170	9425001	0023558	4/30/2027	DAYTON CITY OF STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	614	102.6	0.088	0.186	WL	IL
1171	2718001	0072745	1/31/2016	DECATUR CITY-STP-SIRWA	Decatur	5	THOMPSON R.	1	WASTE STABILIZATION	180	30	0.0177	0.0177	WL	IL
1172	1433001	0035181	10/31/2024	DEDHAM CITY OF STP	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	WASTE STABILIZATION	350	60		0.035	WL	IL
1173	7915001	0071943	6/30/2026	DEEP RIVER, CITY OF STP	Poweshiek	5	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	373	62	0.0275	0.0359	WL	IL
1174	8315001	0042862	6/30/2023	DEFIANCE CITY OF STP	Shelby	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	449	75		0.0475	WL	IL
1175	2813001	0062855	9/30/2018	DELAWARE CITY OF STP	Delaware	1	MAQUOKETA R.	1	WASTE STABILIZATION	207	35	0.0204	0.0204	WL	IL
1176	2817001	0047848	3/31/2027	DELHI CITY OF STP	Delaware	1	MAQUOKETA R.	2	WASTE STABILIZATION	838	140	0.09	0.103	WL	IL
1177	2328001	0061913	1/31/2028	DELMAR, CITY OF STP	Clinton	6	MAQUOKETA R.	1	WASTE STABILIZATION	728	121.5		0.0694	WL	IL
1178	2421001	0020826	6/30/2027	DELOIT CITY OF STP	Crawford	4	BOYER R.	1	WASTE STABILIZATION	225	37.5		0.025	WL	IL
1179	5617901	0073326	5/31/2026	DENMARK SANITARY DISTRICT STP	Lee	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	553	92.4		0.044	WL	IL
1180	5909001	0080322	1/31/2024	DERBY CITY OF STP	Lucas	5	CHARITON R.	1	WASTE STABILIZATION	135	23		0.0135	WL	IL
1181	2503401	0082104	1/31/2016	DES MOINES WEST KOA (NOW RECREATIONAL ADVENTURES	Dallas	5	NORTH RACCOON R.	1	WASTE STABILIZATION	81	14		0.0056		
1182	0712901	0063908	10/31/2021	DEWAR SANITARY DISTRICT STP	Black Hawk	1	SHELLROCK R.	1	WASTE STABILIZATION	305	51	0.03	0.03	WL	IL
1183	2533001	0058661	2/28/2026	DEXTER CITY OF STP	Dallas	5	NORTH RACCOON R.	1	WASTE STABILIZATION	958	160	0.088	0.14	WL	IL
1184	8018001	0063401	11/30/2023	DIAGONAL CITY OF STP	Ringgold	4	GRAND R.	1	WASTE STABILIZATION	368	61		0.0373	WL	IL
1185	3900300	0068381	4/30/2024	DIAMONDHEAD LAKE	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	WASTE STABILIZATION	509	85		0.0564		
1186	2109001	0080691	1/31/2023	DICKENS WASTEWATER TREATMENT FACILITY	Clay	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	228	38	0.0167	0.0222	WL	IL
1187	8225001	0033022	2/28/2026	DIXON CITY OF STP	Scott	6	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	455	76	0.037	0.045	WL	IL
1188	4900900	0066010	12/31/2024	DNR BELLEVUE STATE PARK	Jackson	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	WASTE STABILIZATION	24	4	0.0021	0.0021		
1189	9400904	0076945	6/30/2017	DNR BRUSHY CREEK ST. PARK - S.EQUESTRIAN CAMPGROUND	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	53	9		0.005		
1190	9400903	0074543	6/30/2017	DNR BRUSHY CREEK ST.PARK-N.EQUESTRIAN CAMPGROUND	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	290	49		0.0138		
1191	4400901	0052732	2/28/2027	DNR GEODE STATE PARK	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	2	WASTE STABILIZATION	30	5.01	0.003	0.003		
1192	0400922	0081221	3/11/2013	DNR HONEY CREEK RESORT STATE PARK	Appanoose	5	CHARITON R.	1	WASTE STABILIZATION	623	104	0.031	0.044		
1193	8900904	0081361	4/30/2018	DNR LACEY KEOSAUQUA STATE PARK	Van Buren	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	24	4		0.0021		
1194	9100900	0066001	4/30/2027	DNR LAKE AHQUABI STATE PARK	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	36	6.04	0.0036	0.0036		
1195	4900903	0076473	6/30/2017	DNR MAQUOKETA CAVES STATE PARK	Jackson	1	MAQUOKETA R.	1	WASTE STABILIZATION	53	9		0.0038		
1196	4100900	0066028	2/28/2025	DNR PILOT KNOB STATE PARK	Hancock	2	WINNEBAGO R.	1	WASTE STABILIZATION	30	5		0.0012		
1197	5700402	0078425	1/31/2023	DNR PLEASANT CREEK STATE RECREATION AREA	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	WASTE STABILIZATION	18	3	0.0009	0.0019		
1198	5700403	0078433	1/31/2023	DNR Pleasant Creek State Recreation Area	Linn	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	WASTE STABILIZATION	68	11		0.0044		
1199	8300900	0077119	7/31/2018	DNR PRAIRIE ROSE STATE PARK	Shelby	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	15	3	0.0014	0.0014		
1200	0400913	0054844	6/30/2024	DNR RATHBUN FISH HATCHERY	Appanoose	5	CHARITON R.	1	WASTE STABILIZATION	180	30		0.008		
1201	3300902	0082317	11/30/2014	DNR VOLGA RIVER RECREATIONAL AREA WWTP	Fayette	1	TURKEY R.	1	WASTE STABILIZATION	84	14		0.005		
1202	8227001	0029017	3/31/2028	DONAHUE CITY OF STP	Scott	6	WAPSIPINICON R. BELOW ANAMOSA	2	WASTE STABILIZATION	527	88	0.03	0.058	WL	IL
1203	6015001	0023736	11/30/2027	DOON CITY OF STP	Lyon	3	ROCK R.	1	WASTE STABILIZATION	449	75		0.044	WL	IL
1204	8926001	0076031	2/28/2026	DOUDS/LEANDO,CITY OF(RATHBUN REGIONAL WATER ASSOC)	Van Buren	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	180	30		0.0236	WL	IL
1205	2427001	0034371	4/30/2023	DOW CITY, CITY OF STP	Crawford	4	BOYER R.	1	WASTE STABILIZATION	796	133		0.08	WL	IL
1206	2618001	0075612	1/31/2026	DRAKESVILLE, CITY OF-(RATHBUN REGIONAL WATER ASSOC.)	Davis	6	FOX AND WYACONDA R.S	1	WASTE STABILIZATION	180	30		0.0172	WL	IL
1207	4100901	0065901	4/30/2026	DUNCAN HEIGHTS CARE FACILITY	Hancock	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	71	11	0.0055	0.0055		
1208	9427001	0027413	2/28/2026	DUNCOMBE CITY OF STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	588	100	0.07	0.105	WL	IL
1209	2821001	0062839	11/30/2027	DUNDEE CITY OF STP	Delaware	1	MAQUOKETA R.	1	WASTE STABILIZATION	232	39		0.023	WL	IL
1210	0717001	0042790	12/31/2022	DUNKERTON CITY OF STP	Black Hawk	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	1455	243		0.1715	WL	IL
1211	4316001	0042871	8/31/2023	DUNLAP CITY OF STP	Harrison	4	BOYER R.	1	WASTE STABILIZATION	1593	266		0.154	WL	IL
1212	8114001	0035904	5/31/2025	EARLY CITY OF STP	Sac	3	BOYER R.	1	WASTE STABILIZATION	617	103	0.065	0.081	WL	IL
1213	6122001	0079791	6/30/2027	EAST PERU CITY OF STP (WARREN WATER DISTRICT)	Madison	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	186	31.1	0.0183	0.0183	WL	IL
1214	8631001	0061964	4/30/2016	ELBERON CITY OF STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	228	38	0.0207	0.0225	WL	IL
1215	9053001	0022306	8/31/2024	ELDON CITY OF STP	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	1916	320		0.1916	WL	IL
1216	8325001	0027677	8/31/2026	ELK HORN CITY OF STP	Shelby	4	EAST NISHNABOTNA R.	1	WASTE STABILIZATION	1115	186	0.1026	0.1026	WL	IL
1217	7825001	0034398	2/25/2012	ELLIOTT CITY OF STP	Pottawattamie	4	EAST NISHNABOTNA R.	1	WASTE STABILIZATION	665	111		0.0744	WL	IL
1218	4009001	0026280	11/30/2027	ELLSWORTH CITY OF STP	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	3772	630		0.203	WL	IL
1219	2334901	0062791	7/31/2016	ELWOOD COMMUNITY SANITARY DISTRICT	Clinton	6	MAQUOKETA R.	1	WASTE STABILIZATION	219	37		0.0194	WL	IL
1220	6520001	0024562	4/30/2023	EMERSON CITY OF STP	Mills	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	611	102		0.0769	WL	IL
1221	7349001	0026603	9/30/2027	ESSEX CITY OF STP	Page	4	EAST NISHNABOTNA R.	1	WASTE STABILIZATION	856	143	0.111	0.9	WL	IL
1222	0520001	0027987	11/30/2026	EXIRA CITY OF STP	Audubon	4	EAST NISHNABOTNA R.	2	WASTE STABILIZATION	928	155	0.0715	0.128	WL	IL
1223	0426001	0074381	2/28/2015	Exline, City of, STP	Appanoose	5	CHARITON R.	1	WASTE STABILIZATION	190	32	0.0187	0.0206	WL	IL
1224	5322001	0082929	6/30/2021	FAIRVIEW, COMMUNITY OF	Jones	1	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	205	34		0.0188	WL	IL
1225	2228001	0028495	9/30/2021	FARMERSBURG CITY OF STP	Clayton	1	TURKEY R.	1	WASTE STABILIZATION	389	65		0.0314	WL	IL
1226	8930001	0060313	8/31/2027	FARMINGTON CITY OF STP	Van Buren	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	1102	184		0.0937	WL	IL
1227	3615001	0023493	6/30/2027	FARRAGUT CITY OF STP	Fremont	4	EAST NISHNABOTNA R.	1	WASTE STABILIZATION	449	75	0.034	0.044	WL	IL
1228	5515001	0081396	4/30/2016	FENTON CITY OF STP	Kossuth	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	323	54	0.025	0.032	WL	IL

1229	9820001	0058718	3/31/2026	FERTILE CITY OF STP	Worth	2	WINNEBAGO R.	1	WASTE STABILIZATION	593	99		0.056	WL	IL
1230	3937900	0076465	4/30/2027	FIREFLY CREEK RANCH	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	WASTE STABILIZATION	43	7.1		0.005		
1231	2622000	0074047	1/31/2016	FLORIS, CITY OF- (WAPELLO RURAL WATER ASSN.)	Davis	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	180	30		0.017	WL	IL
1232	4000201	0082309	11/30/2025	FLYING J NO. 572	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	99	17		0.0124		
1233	7603002	0046671	3/31/2027	FONDA CITY OF STP	Pocahontas	3	NORTH RACCOON R.	1	WASTE STABILIZATION	1146	191		0.128	WL	IL
1234	9641001	0072176	1/31/2024	FORT ATKINSON CITY OF STP	Winneshiek	1	TURKEY R.	1	WASTE STABILIZATION	403	67.3	0.0367	0.0367	WL	IL
1235	2122001	0061841	8/31/2023	FOSTORIA CITY OF STP	Clay	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	336	56		0.033	WL	IL
1236	0922001	0058939	7/31/2024	FREDERIKA CITY OF STP	Bremer	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	295	49.3		0.0295	WL	IL
1237	6234001	0056791	3/31/2017	FREMONT CITY OF STP	Mahaska	5	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	743	124		0.07	WL	IL
1238	2725001	0069175	10/31/2022	GARDEN GROVE CITY OF STP	Decatur	5	THOMPSON R.	1	WASTE STABILIZATION	329	55		0.0315	WL	IL
1239	0625001	0056804	5/31/2028	GARRISON CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	WASTE STABILIZATION	419	70	0.04	0.068	WL	IL
1240	8637001	0025925	6/30/2020	GARWIN CITY OF STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	766	128		0.075	WL	IL
1241	2900901	0065447	7/31/2025	GATEWAY CENTER CARE FACILITY-STP	Des Moines	6	FLINT R.	1	WASTE STABILIZATION	114	19		0.0078		
1242	6028001	0036081	10/31/2027	GEORGE CITY OF STP	Lyon	3	ROCK R.	2	WASTE STABILIZATION	1174	196	0.091	0.218	WL	IL
1243	7607001	0031194	10/31/2018	GILMORE CITY, CITY OF STP	Pocahontas	3	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	1198	200	0.051	0.081	WL	IL
1244	9937001	0036137	7/31/2018	GOLDFIELD CITY OF STP	Wright	2	BOONE R.	1	WASTE STABILIZATION	3473	580	0.121	0.121	WL	IL
1245	4135001	0082562	2/29/2028	GOODELL CITY OF STP	Hancock	2	IOWA R. ABOVE ALBION	2	WASTE STABILIZATION	156	26	0.015	0.015	WL	IL
1246	2339001	0056944	9/30/2026	GOOSE LAKE CITY OF STP	Clinton	6	MAQUOKETA R.	1	WASTE STABILIZATION	392	66		0.0369	WL	IL
1247	7445001	0027821	11/30/2027	GRAETTINGER CITY OF STP	Palo Alto	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	WASTE STABILIZATION	826	138	0.081	0.163	WL	IL
1248	9825001	0062529	3/31/2028	GRAFTON CITY OF STP	Worth	2	SHELLROCK R.	1	WASTE STABILIZATION	341	57	0.0205	0.0283	WL	IL
1249	3730001	0041891	4/30/2027	GRAND JUNCTION CITY OF STP	Greene	4	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	987	165	0.112	0.152	WL	IL
1250	2341001	0027642	12/31/2024	GRAND MOUND CITY OF STP	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	796	133		0.105	WL	IL
1251	2728001	0066346	4/30/2028	GRAND RIVER CITY OF STP	Decatur	5	THOMPSON R.	1	WASTE STABILIZATION	204	34	0.016	0.02	WL	IL
1252	8429001	0043486	12/31/2022	GRANVILLE CITY OF STP	Sioux	3	FLOYD R.	1	WASTE STABILIZATION	222	37		0.028	WL	IL
1253	8728001	0075957	10/31/2026	GRAVITY, CITY OF (SOUTHERN IOWA RURAL WATER ASSN.)	Taylor	4	HUNDRED AND TWO	1	WASTE STABILIZATION	222	37		0.0218	WL	IL
1254	2831001	0040291	10/31/2022	GREELEY CITY OF STP	Delaware	1	MAQUOKETA R.	1	WASTE STABILIZATION	518	86.5		0.048	WL	IL
1255	2900603	0067733	6/28/2014	GREEN ACRES MOBILE HOME PARK	Des Moines	6	FLINT R.	1	WASTE STABILIZATION	341	57		0.0169		
1256	6440001	0048236	5/31/2026	GREEN MOUNTAIN - IOWA REGIONAL UTILITIES ASSOC.	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	282	47.1	0.014	0.024	WL	IL
1257	8800100	0003964	4/30/2016	GREEN VALLEY CHEMICAL CORPORATION	Union	4	THOMPSON R.	1	WASTE STABILIZATION						
1258	1528001	0031411	3/31/2027	GRISWOLD CITY OF STP	Cass	4	EAST NISHNABOTNA R.	1	WASTE STABILIZATION	1275	213	0.106	0.347	WL	IL
1259	3225001	0077488	8/31/2023	GRUVER CITY OF	Emmet	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	WASTE STABILIZATION	204	34		0.0199	WL	IL
1260	3937001	0041866	7/31/2027	GUTHRIE CENTER CITY OF STP	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	WASTE STABILIZATION	2222	371		0.2789	WL	IL
1261	1444001	0075817	10/31/2023	HALBUR CITY OF (WEST CENTRAL IA RURAL WATER ASSN)	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	WASTE STABILIZATION	216	36		0.0215	WL	IL
1262	3621001	0048321	11/30/2022	HAMBURG CITY OF STP	Fremont	4	NISHNABOTNA R.	1	WASTE STABILIZATION	1886	315		0.252	WL	IL
1263	7833001	0023485	7/31/2024	HANCOCK CITY OF STP	Pottawattamie	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	407	68		0.025	WL	IL
1264	9442001	0076244	1/31/2023	HARCOURT, CITY OF STP	Webster	2	NORTH RACCOON R.	1	WASTE STABILIZATION	365	61	0.018	0.036	WL	IL
1265	5428001	0079359	2/28/2026	HARPER, CITY OF STP	Keokuk	6	NORTH SKUNK R.	1	WASTE STABILIZATION	137	23	0.01	0.0134	WL	IL
1266	7222001	0036048	9/30/2022	HARRIS CITY OF STP	Osceola	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	299	50	0.0116	0.0225	WL	IL
1267	5000603	0065668	9/30/2023	HARVESTER GOLF CLUB DEVELOPMENT	Jasper	5	SKUNK R. ABOVE THE NORTH SKUNK	2	WASTE STABILIZATION	407	68	0.036	0.04		
1268	6338001	0072338	2/29/2028	HARVEY CITY OF STP	Marion	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	281	47		0.021	WL	IL
1269	6527001	0079758	5/31/2028	HASTINGS, CITY OF STP	Mills	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	329	55	0.014	0.025	WL	IL
1270	5600602	0068063	12/31/2015	HAWES ENTERPRISES LLC	Lee	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	253	43		0.0053		
1271	5600605	0067938	4/27/2013	HAWES INVESTMENTS (NOW DENNINGS BROTHERS LLC, SERIES	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	WASTE STABILIZATION	78	13		0.005		
1272	3346001	0036072	4/30/2025	HAWKEYE CITY OF STP	Fayette	1	TURKEY R.	2	WASTE STABILIZATION	575	96	0.03	0.071	WL	IL
1273	4100201	0083160	8/31/2024	HAWKEYE PRIDE EGG FARMS, L.L.P.	Hancock	2	BOONE R.	1	WASTE STABILIZATION	102	17		0.0075		
1274	1031001	0044024	5/31/2028	HAZLETON CITY OF STP	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	1018	170		0.17	WL	IL
1275	6529001	0061590	7/31/2023	HENDERSON CITY OF STP	Mills	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	240	40		0.021	WL	IL
1276	8600900	0066940	9/30/2025	HICKORY HILLS PARK	Tama	5	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	WASTE STABILIZATION	48	8		0.0018		
1277	9000601	0067636	10/31/2017	HIDDEN VALLEY MHP (NOW BEAR CREEK FLATS)	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	175	29		0.0122		
1278	4425001	0072435	6/30/2016	HILLSBORO CITY OF STP	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	154	26		0.0151	WL	IL
1279	4800901	0065927	4/30/2018	HILLSIDE ESTATES CARE FACILITY (NOW BAYER PRODUCTION	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	71	11.9	0.007	0.007		
1280	7528001	0057053	8/31/2027	HINTON CITY OF STP	Plymouth	3	FLOYD R.	1	WASTE STABILIZATION	1275	213		0.0902	WL	IL
1281	3839001	0041254	4/30/2026	HOLLAND CITY OF STP	Grundy	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	WASTE STABILIZATION	340	57		0.033	WL	IL
1282	4721001	0021954	12/31/2022	HOLSTEIN CITY OF STP	Ida	3	MAPLE R.	1	WASTE STABILIZATION	1946	325		0.355	WL	IL
1283	3146001	0025992	3/31/2024	HOLY CROSS CITY OF STP	Dubuque	1	MAQUOKETA R.	1	WASTE STABILIZATION	467	78	0.044	0.056	WL	IL
1284	8500603	0067806	12/31/2015	HOMESTEAD COLONY MOBILE HOME PARK	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	138	23		0.0096		
1285	4830901	0023591	9/30/2027	HOMESTEAD SANITARY DISTRICT	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	419	70	0.034	0.083	WL	IL
1286	9738001	0036501	12/31/2023	HORNICK CITY OF STP	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	WASTE STABILIZATION	380	63.5		0.035	WL	IL
1287	5633001	0036901	6/30/2016	HOUGHTON CITY OF STP	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	WASTE STABILIZATION	338	57		0.0395	WL	IL
1288	4254001	0031429	11/30/2019	HUBBARD CITY OF STP	Hardin	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	1132	189	0.067	0.136	WL	IL
1289	6040001	0031232	12/31/2022	INWOOD CITY OF STP	Lyon	3	BIG SIOUX R. ABOVE THE ROCK	2	WASTE STABILIZATION	1156	193		0.245	WL	IL
1290	5200401	0067083	10/31/2026	IO-DIS-E-CA CAMP	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	50	8		0.005		
1291	1946001	0058777	4/30/2025	IONIA CITY OF STP	Chickasaw	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	368	61		0.0355	WL	IL
1292	0100903	0068756	5/28/2014	IOWA DOT REST AREA #01-I80 ADAIR	Adair	4	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	228	38		0.008		
1293	0100902	0068764	8/31/2019	IOWA DOT REST AREA #02 I80 ADAIR	Adair	4	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	156	26		0.007		
1294	4800903	0067598	3/31/2021	IOWA DOT REST AREA #06 I80 VICTOR	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	569	95		0.016		
1295	8500902	0067555	7/31/2017	IOWA DOT REST AREA #19 I35 STORY CITY	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	137	23		0.0048		
1296	8500903	0067547	7/31/2017	IOWA DOT REST AREA #20 I35 STORY CITY	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	120	20		0.0039		
1297	7800903	0068896	1/31/2019	IOWA DOT REST AREA #23-I680 LOVELAND	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	WASTE STABILIZATION	28	4.62		0.0022		
1298	7800904	0068900	12/31/2023	IOWA DOT REST AREA #24-I680 LOVELAND	Pottawattamie	4	PIGEON AND MOSQUITO CR.S	1	WASTE STABILIZATION	39	6.55		0.0031		
1299	2700902	0068934	8/31/2018	IOWA DOT REST AREA #34 I35 LAMONI	Decatur	5	THOMPSON R.	1	WASTE STABILIZATION	353	59		0.014		
1300	3500904	0077321	3/31/2025	IOWA DOT REST AREA I35 DOWS (IRUA)	Franklin	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	305	51	0.011	0.011		
1301	8447001	0027961	9/30/2023	IRETON CITY OF STP	Sioux	3	BIG SIOUX R. BELOW THE ROCK	2	WASTE STABILIZATION	662	110.5	0.04	0.058	WL	IL
1302	8340001	0021024	5/31/2027	IRWIN CITY OF STP	Shelby	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	988	165	0.0533	0.065	WL	IL
1303	5000706	0076848	2/28/2025	JASPER COUNTY REGIONAL WASTEWATER SYSTEM	Jasper	5	NORTH SKUNK R.	1	WASTE STABILIZATION	1129	188.5	0.1	0.111	WL	IL
1304	4000701	0079898	1/31/2025	JAY BROS INC.	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	62	10	0.0039	0.0039		
1305	4027001	0024422	12/31/2022	JEWELL CITY OF STP	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	2054	343	0.133	0.175	WL	IL

1306	9835001	0052077	8/31/2020	JOICE, CITY OF STP	Worth	2	WINNEBAGO R.	1	WASTE STABILIZATION	269	45	0.0214	0.0234	WL	IL
1307	9233001	0059196	4/30/2027	KALONA CITY OF STP	Washington	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	2988	499	0.251	0.285	WL	IL
1308	4033001	0069124	1/31/2023	KAMRAR CITY OF STP	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	251	42	0.024	0.0245	WL	IL
1309	4150001	0026000	4/30/2026	KANAWHA CITY OF STP	Hancock	2	BOONE R.	1	WASTE STABILIZATION	1347	225	0.1	0.185	WL	IL
1310	8040001	0061760	1/31/2027	KELLERTON CITY OF STP	Ringgold	4	GRAND R.	1	WASTE STABILIZATION	407	68		0.034	WL	IL
1311	5038001	0043541	5/31/2025	KELLOGG CITY OF STP	Jasper	5	NORTH SKUNK R.	1	WASTE STABILIZATION	934	156		0.1	WL	IL
1312	9840001	0076635	8/31/2016	KENSETT, CITY OF-STP	Worth	2	SHELLROCK R.	1	WASTE STABILIZATION	305	51	0.03	0.03	WL	IL
1313	6245001	0062073	10/31/2024	KEOMAH VILLAGE CITY OF STP	Mahaska	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	222	37		0.028	WL	IL
1314	8938001	0023361	4/30/2025	KEOSAUQUA CITY OF STP	Van Buren	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	1293	216	0.137	0.18	WL	IL
1315	5442001	0079910	7/31/2027	KESWICK, CITY OF STP	Keokuk	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	301	50.2		0.0295	WL	IL
1316	5444001	0077186	12/31/2027	KINROSS, CITY OF STP (RUSS)	Keokuk	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	90	15.1	0.0067	0.0089	WL	IL
1317	4800104	0076881	4/30/2022	KINZE MANUFACTURING, INC.	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	168	28.1		0.0112		
1318	9069001	0074667	4/30/2027	KIRKVILLE, CITY OF	Wapello	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	180	30	0.0133	0.0177	WL	IL
1319	4945001	0056707	12/31/2025	LA MOTTE CITY OF STP	Jackson	1	MAQUOKETA R.	1	WASTE STABILIZATION	335	56	0.033	0.06	WL	IL
1320	9138001	0022021	6/30/2016	LACONA CITY OF STP	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	550	92		0.081	WL	IL
1321	1345003	0020842	7/31/2023	LAKE CITY CITY OF STP	Calhoun	3	NORTH RACCOON R.	1	WASTE STABILIZATION	2509	419	0.231	0.3	WL	IL
1322	9900900	0066401	7/31/2022	LAKE CORNELIA SANITARY DISTRICT	Wright	2	BOONE R.	1	WASTE STABILIZATION	475	79		0.0403	WL	IL
1323	9200403	0080853	1/31/2024	LAKE DARLING YOUTH CENTER CAMP	Washington	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	33	6	0.0112	0.0112		
1324	6300907	0083402	5/31/2016	LAKE RED ROCK - WHITEBREAST SEWAGE LAGOON	Marion	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	114	19		0.0091		
1325	8200602	0067695	10/31/2027	LAKEWOOD ESTATES MOBILE HOME PARK	Scott	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	2	WASTE STABILIZATION	509	85	0.046	0.101		
1326	5540001	0078697	10/31/2023	LAKOTA CITY OF STP	Kossuth	2	BLUE EARTH R.	1	WASTE STABILIZATION	263	44		0.026	WL	IL
1327	1051001	0025348	7/31/2022	LAMONT CITY OF STP	Buchanan	1	MAQUOKETA R.	1	WASTE STABILIZATION	515	86		0.089	WL	IL
1328	1449001	0062162	12/31/2026	LANESBORO CITY OF STP	Carroll	4	NORTH RACCOON R.	1	WASTE STABILIZATION	249	42		0.0245	WL	IL
1329	6000112	0052919	7/31/2027	LARCHWOOD 1447 LLC	Lyon	3	BIG SIOUX R. ABOVE THE ROCK	1	WASTE STABILIZATION	461	77	0.039	0.039		
1330	6050001	0047333	4/30/2022	LARCHWOOD CITY OF STP	Lyon	3	BIG SIOUX R. ABOVE THE ROCK	1	WASTE STABILIZATION	916	153		0.135	WL	IL
1331	1833001	0024589	11/30/2015	LARRABEE CITY OF STP	Cherokee	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	177	30	0.007	0.016	WL	IL
1332	3554001	0062944	9/30/2016	LATIMER-COULTER CITY OF STP	Franklin	2	WEST FORK CEDAR R.	1	WASTE STABILIZATION	862	144	0.0644	0.0789	WL	IL
1333	7614001	0025950	8/31/2026	LAURENS CITY OF STP	Pocahontas	3	NORTH RACCOON R.	1	WASTE STABILIZATION	3886	649	0.19	0.7	WL	IL
1334	1957001	0056910	2/28/2027	LAWLER CITY OF STP	Chickasaw	1	TURKEY R.	2	WASTE STABILIZATION	509	85		0.18	WL	IL
1335	9743001	0043168	4/30/2024	LAWTON CITY OF STP	Woodbury	3	WEST FORK LITTLE SIOUX R.	1	WASTE STABILIZATION	695	116	0.067	0.0725	WL	IL
1336	8657001	0027235	9/30/2025	LEGRAND CITY OF STP	Tama	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	WASTE STABILIZATION	1695	283	0.11	0.19	WL	IL
1337	9453001	0021296	3/31/2016	LEHIGH CITY OF STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	874	146		0.072	WL	IL
1338	6259001	0080501	7/31/2024	LEIGHTON, CITY OF STP	Mahaska	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	204	34	0.0138	0.018	WL	IL
1339	4900401	0079766	9/30/2021	LEISURE LAKE, COMMUNITY OF	Jackson	1	MAQUOKETA R.	1	WASTE STABILIZATION	422	70.4		0.0301	WL	IL
1340	9549001	0036528	5/31/2028	LELAND CITY OF STP	Winnebago	2	WINNEBAGO R.	1	WASTE STABILIZATION	305	51	0.0165	0.0335	WL	IL
1341	6055001	0026620	2/28/2017	LESTER CITY OF STP	Lyon	3	ROCK R.	2	WASTE STABILIZATION	305	51	0.024	0.0335	WL	IL
1342	5847001	0061492	4/30/2016	LETTS CITY OF STP	Louisa	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	551	92		0.0918	WL	IL
1343	1535001	0057487	5/31/2020	LEWIS CITY OF STP	Cass	4	EAST NISHNABOTNA R.	1	WASTE STABILIZATION	671	112		0.061	WL	IL
1344	9144301	0080152	5/31/2023	LIBERTY CENTER CITY OF (WARREN CO. BOARD OF	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	229	38.3	0.0144	0.0144	WL	IL
1345	5148001	0062821	6/30/2016	LIBERTYVILLE CITY OF STP	Jefferson	6	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	437	73		0.043	WL	IL
1346	1453001	0056855	4/30/2028	LIDDERDALE CITY OF STP	Carroll	4	MIDDLE AND SOUTH RACCOON R.S	1	WASTE STABILIZATION	359	60		0.027	WL	IL
1347	2000300	0068403	2/29/2028	LIFT, L.L.C.	Clarke	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	50	8.35		0.005		
1348	2300603	0071391	9/30/2025	LINCOLN MEADOWS, LLC	Clinton	6	MISSISSIPPI R. NEAR CLINTON	1	WASTE STABILIZATION	443	74	0.026	0.039		
1349	3944001	0081973	5/31/2023	LINDEN CITY OF STP	Guthrie	4	MIDDLE AND SOUTH RACCOON R.S	1	WASTE STABILIZATION	275	46		0.027	WL	IL
1350	9352001	0071897	11/30/2017	LINEVILLE CITY OF STP	Wayne	5	THOMPSON R.	1	WASTE STABILIZATION	350	59		0.0344	WL	IL
1351	1147001	0042897	4/30/2022	LINN GROVE CITY OF STP	Buena Vista	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	315	52.6	0.0297	0.0307	WL	IL
1352	9200601	0068560	10/31/2026	LINN HOLLOW MOBILE HOME PARK	Washington	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	102	17		0.005		
1353	6462001	0056847	3/31/2028	LISCOMB CITY OF STP	Marshall	5	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	356	59.5	0.021	0.035	WL	IL
1354	6060001	0025356	12/31/2021	LITTLE ROCK CITY OF STP	Lyon	3	ROCK R.	1	WASTE STABILIZATION	527	88	0.043	0.056	WL	IL
1355	4333001	0080276	4/30/2019	LITTLE SIOUX/RIVER SIOUX STP	Harrison	4	LITTLE SIOUX R.	1	WASTE STABILIZATION	378	63		0.037	WL	IL
1356	4647001	0023566	4/30/2023	LIVERMORE CITY OF STP	Humboldt	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	719	120		0.11	WL	IL
1357	5157001	0072729	8/31/2018	LOCKRIDGE CITY OF STP	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	302	50	0.029	0.029	WL	IL
1358	4337001	0058599	3/31/2028	LOGAN CITY OF STP	Harrison	4	BOYER R.	1	WASTE STABILIZATION	2114	353	0.198	0.248	WL	IL
1359	1389002	0084280	7/31/2023	LOHRVILLE, CITY OF STP	Calhoun	3	NORTH RACCOON R.	2	WASTE STABILIZATION	335	56		0.053	WL	IL
1360	5547001	0082341	2/28/2025	LONE ROCK, CITY OF STP	Kossuth	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	156	26	0.0155	0.0175	WL	IL
1361	3100601	0063983	6/30/2018	LORE MOBILE HOME PARK STP	Dubuque	1	LITTLE MAQUOKETA R.	2	WASTE STABILIZATION	66	11	0.0047	0.0067		
1362	8834001	0062910	11/30/2026	LORIMOR CITY OF STP	Union	4	THOMPSON R.	1	WASTE STABILIZATION	611	102		0.0607	WL	IL
1363	2346001	0036544	9/30/2027	LOST NATION CITY OF STP	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	838	140		0.0817	WL	IL
1364	5800901	0066117	9/30/2026	LOUISA CO. LAW ENFORCEMENT CENTER	Louisa	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	60	10		0.006		
1365	5551001	0082571	2/28/2023	LU VERNE, CITY OF STP	Kossuth	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	305	51	0.0299	0.0339	WL	IL
1366	2254001	0027685	3/31/2027	LUANA CITY OF STP	Clayton	1	YELLOW R. AND PAINT CR.	1	WASTE STABILIZATION	389	65		0.0314	WL	IL
1367	5915001	0072621	3/31/2028	LUCAS CITY OF STP (RATHBUN REGIONAL WATER	Lucas	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	228	38	0.018	0.024	WL	IL
1368	3158001	0074781	11/30/2024	LUXEMBURG, CITY OF-STP	Dubuque	1	MAQUOKETA R.	1	WASTE STABILIZATION	331	55.3	0.0254	0.0317	WL	IL
1369	5047001	0041971	11/30/2018	LYNNVILLE CITY OF STP	Jasper	5	NORTH SKUNK R.	1	WASTE STABILIZATION	419	70		0.041	WL	IL
1370	8133001	0020940	4/30/2022	LYTTON CITY OF STP	Sac	3	NORTH RACCOON R.	1	WASTE STABILIZATION	1317	220	0.158	0.1748	WL	IL
1371	4100105	0004791	3/31/2026	M.G. WALDBAUM COMPANY - LAOP	Hancock	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	7100	1136	0.15	0.15		
1372	7841001	0042919	5/31/2027	MACEDONIA CITY OF STP	Pottawattamie	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	331	55.25	0.0416	0.0418	WL	IL
1373	6134001	0079928	8/31/2024	MACKSBURG, CITY OF STP	Madison	5	THOMPSON R.	1	WASTE STABILIZATION	163	27		0.016	WL	IL
1374	5200306	0073733	10/31/2025	MAKADA SUBDIVISION-STP	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	105	17	0.009	0.0103		
1375	7945001	0048011	5/31/2025	MALCOM CITY OF STP	Poweshiek	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	WASTE STABILIZATION	478	80	0.0352	0.0396	WL	IL
1376	7450001	0023370	12/31/2020	MALLARD CITY OF STP	Palo Alto	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	WASTE STABILIZATION	539	90	0.048	0.0544	WL	IL
1377	6545001	0058572	12/31/2024	MALVERN CITY OF STP	Mills	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	1449	242	0.238	0.365	WL	IL
1378	2436001	0047368	7/31/2023	MANILLA CITY OF STP	Crawford	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	946	158	0.07	0.0928	WL	IL
1379	9845001	0047830	6/30/2025	MANLY CITY OF STP	Worth	2	SHELLROCK R.	1	WASTE STABILIZATION	1647	275		0.197	WL	IL
1380	1351001	0027189	6/30/2024	MANSON CITY OF STP	Calhoun	3	NORTH RACCOON R.	1	WASTE STABILIZATION	1934	323	0.19	0.442	WL	IL
1381	3420001	0057207	4/30/2025	MARBLE ROCK CITY OF STP	Floyd	2	SHELLROCK R.	1	WASTE STABILIZATION	614	103		0.06	WL	IL
1382	1838001	0036111	1/31/2025	MARCUS CITY OF STP	Cherokee	3	WEST FORK LITTLE SIOUX R.	1	WASTE STABILIZATION	778	130	0.135	0.235	WL	IL

1383	6400901	0075973	6/30/2020	MARSHALL COUNTY LAW CENTER	Marshall	5	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	2	WASTE STABILIZATION	347	58		0.0217		
1384	5737001	0062987	4/30/2028	MARTELLE CITY OF STP	Linn	1	CEDAR R. BELOW CEDAR RAPIDS	1	WASTE STABILIZATION	509	85		0.08	WL	IL
1385	9147001	0031836	9/30/2026	MARTENSDALE CITY OF STP	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	509	85		0.08	WL	IL
1386	5452001	0078727	9/30/2026	MARTINSBURG, CITY OF STP	Keokuk	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	138	23		0.0135	WL	IL
1387	2843001	0077241	2/29/2024	MASONVILLE, CITY OF-STP	Delaware	1	MAQUOKETA R.	1	WASTE STABILIZATION	153	26	0.011	0.015	WL	IL
1388	8458001	0023451	1/31/2022	MAURICE CITY OF STP	Sioux	3	FLOYD R.	1	WASTE STABILIZATION	365	61	0.0128	0.0346	WL	IL
1389	3350001	0025976	4/30/2024	MAYNARD CITY OF STP	Fayette	1	TURKEY R.	1	WASTE STABILIZATION	629	105	0.054	0.081	WL	IL
1390	8552001	0051934	10/31/2017	MCCALLSBURG CITY OF STP	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	377	63		0.0468	WL	IL
1391	8258001	0057185	10/31/2024	MCCAUSLAND CITY OF STP	Scott	6	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	431	72		0.0424	WL	IL
1392	6868001	0076902	7/31/2016	MELROSE CITY OF STP (RATHBUN REGIONAL WATER ASSN)	Monroe	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	153	26		0.015	WL	IL
1393	7234001	0083658	12/31/2022	MELVIN CITY OF STP	Osceola	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	295	49.3		0.029	WL	IL
1394	3956001	0071374	12/31/2026	MENLO CITY OF STP	Guthrie	4	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	485	81	0.029	0.0455	WL	IL
1395	1849001	0020753	7/31/2019	MERIDEN CITY OF STP	Cherokee	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	275	46	0.0255	0.0255	WL	IL
1396	7548001	0024538	1/31/2020	MERRILL CITY OF STP	Plymouth	3	FLOYD R.	1	WASTE STABILIZATION	816	136	0.0657	0.0825	WL	IL
1397	1754001	0076724	8/31/2021	MESERVEY, CITY OF-STP	Cerro Gordo	2	WEST FORK CEDAR R.	1	WASTE STABILIZATION	287	48	0.028	0.028	WL	IL
1398	4852001	0077283	11/30/2017	MILLERSBURG CITY OF (POWESHIEK WATER ASSN)	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	192	32		0.0188	WL	IL
1399	8954001	0058751	11/30/2017	MILTON CITY OF STP	Van Buren	6	FOX AND WYACONDA R.S	1	WASTE STABILIZATION	599	100		0.0821	WL	IL
1400	2547001	0023418	12/31/2026	MINBURN CITY OF STP	Dallas	5	NORTH RACCOON R.	2	WASTE STABILIZATION	407	68	0.04	0.04	WL	IL
1401	7849001	0048330	6/30/2026	MINDEN CITY OF STP	Pottawattamie	4	KEG AND WAUBONSIE CR.S	2	WASTE STABILIZATION	689	115	0.112	0.123	WL	IL
1402	6549001	0082082	7/31/2019	MINEOLA CITY OF STP	Mills	4	KEG AND WAUBONSIE CR.S	1	WASTE STABILIZATION	195	32.5	0.015	0.019	WL	IL
1403	5052001	0022276	12/31/2025	MINGO CITY OF STP	Jasper	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	509	85		0.043	WL	IL
1404	4344001	0026654	2/13/2012	MISSOURI VALLEY CITY OF STP	Harrison	4	BOYER R.	1	WASTE STABILIZATION	4401	735		0.4326	WL	IL
1405	4347001	0081051	6/30/2019	MODALE, CITY OF STP	Harrison	4	ALLEN CR.	1	WASTE STABILIZATION	335	56		0.0325	WL	IL
1406	6731001	0062995	6/30/2023	MOORHEAD CITY OF STP	Monona	4	SOLDIER R.	1	WASTE STABILIZATION	407	68		0.038	WL	IL
1407	0472001	0020851	10/31/2025	MOULTON CITY OF STP	Appanoose	5	FOX AND WYACONDA R.S	1	WASTE STABILIZATION	677	113	0.067	0.17	WL	IL
1408	0650001	0059153	8/31/2020	MOUNT AUBURN CITY OF STP	Benton	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	2	WASTE STABILIZATION	189	31.5		0.0185	WL	IL
1409	2032001	0063304	12/31/2023	MURRAY CITY OF STP	Clarke	5	THOMPSON R.	1	WASTE STABILIZATION	865	144.5	0.075	0.084	WL	IL
1410	0477001	0071064	12/31/2015	MYSTIC CITY OF STP	Appanoose	5	CHARITON R.	1	WASTE STABILIZATION	725	121		0.071	WL	IL
1411	8264001	0075221	1/31/2028	NEW LIBERTY, CITY OF-STP	Scott	6	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	216	36	0.021	0.021	WL	IL
1412	8758001	0033049	5/31/2015	NEW MARKET CITY OF STP	Taylor	4	HUNDRED AND TWO	1	WASTE STABILIZATION	599	100	0.06	0.08	WL	IL
1413	4271001	0028193	5/31/2018	NEW PROVIDENCE CITY OF STP	Hardin	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	251	42		0.0249	WL	IL
1414	1155001	0021989	6/30/2021	NEWELL, CITY OF STP	Buena Vista	3	NORTH RACCOON R.	2	WASTE STABILIZATION	1180	197	0.146	0.255	WL	IL
1415	7052001	0036561	6/30/2027	NICHOLS CITY OF STP	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	1	WASTE STABILIZATION	551	92		0.045	WL	IL
1416	0260001	0040231	5/31/2026	NODAWAY CITY OF (SIRWA)	Adams	4	EAST NODAWAY R.	1	WASTE STABILIZATION	234	39	0.0209	0.0209	WL	IL
1417	7856001	0033448	9/30/2024	OAKLAND CITY OF STP	Pottawattamie	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	1826	305	0.02	0.15	WL	IL
1418	5868001	0073601	9/30/2022	OAKVILLE CITY OF STP	Louisa	6	MISSISSIPPI R. FROM THE WAPSIPINICON TO THE IOWA	1	WASTE STABILIZATION	449	75	0.0375	0.0442	WL	IL
1419	7239001	0035068	10/31/2017	OCHEYEDAN CITY OF STP	Osceola	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	593	99	0.0561	0.0836	WL	IL
1420	8144001	0032506	6/30/2022	ODEBOLT CITY OF STP	Sac	3	MAPLE R.	2	WASTE STABILIZATION	1030	172	0.147	0.306	WL	IL
1421	4465001	0074560	6/30/2025	OLDS MUNICIPAL UTILITIES	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	210	35		0.0205	WL	IL
1422	5355001	0036064	2/28/2027	OLIN CITY OF STP	Jones	1	WAPSIPINICON R. BELOW ANAMOSA	2	WASTE STABILIZATION	946	158		0.175	WL	IL
1423	5460001	0083801	2/29/2020	OLLIE, CITY OF STP	Keokuk	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	228	38.1	0.0168	0.0224	WL	IL
1424	5358001	0057134	10/31/2022	ONSLOW CITY OF STP	Jones	1	MAQUOKETA R.	1	WASTE STABILIZATION	479	80		0.0346	WL	IL
1425	0900902	0070751	4/30/2016	ORAN COMMUNITY SANITATION DISTRICT	Bremer	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	305	51		0.021	WL	IL
1426	6658001	0064271	4/30/2017	ORCHARD CITY OF STP	Mitchell	2	CEDAR R. ABOVE THE SHELLROCK R.	1	WASTE STABILIZATION	102	17		0.013	WL	IL
1427	0160001	0074535	7/28/2014	ORIENT STP (SIRWA)	Adair	4	THOMPSON R.	1	WASTE STABILIZATION	466	80	0.029	0.0432	WL	IL
1428	9464001	0032948	10/31/2019	OTHO CITY OF STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	563	94	0.06	0.15	WL	IL
1429	9758001	0065811	7/31/2027	OTO CITY OF STP	Woodbury	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	186	31	0.015	0.018	WL	IL
1430	5361001	0032450	12/31/2026	OXFORD JUNCTION CITY OF STP	Jones	1	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	808	135		0.087	WL	IL
1431	7561001	0032336	4/30/2023	OYENS CITY OF STP	Plymouth	3	FLOYD R.	1	WASTE STABILIZATION	115	19.21	0.0113	0.0113	WL	IL
1432	7622001	0079308	10/31/2022	PALMER, CITY OF STP	Pocahontas	3	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	218	36		0.0254	WL	IL
1433	8355001	0071455	12/31/2023	PANAMA CITY OF STP	Shelby	4	PIGEON AND MOSQUITO CR.S	2	WASTE STABILIZATION	171	28.6	0.0243	0.0227	WL	IL
1434	6368301	0075434	5/31/2027	PARK HILLS WASTEWATER FACILITY	Marion	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	90	15	0.012	0.012	WL	IL
1435	1281001	0058831	3/31/2022	PARKERSBURG CITY OF STP	Butler	2	WEST FORK CEDAR R.	1	WASTE STABILIZATION	1347	225		0.489	WL	IL
1436	0400302	0053188	2/28/2025	PARKSIDE KNOLLS HOA	Appanoose	5	CHARITON R.	1	WASTE STABILIZATION						
1437	5200603	0068349	9/30/2025	PARKVIEW MOBILE HOME COURT	Johnson	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	126	21		0.023		
1438	4863001	0071188	7/31/2027	PARNELL CITY OF STP	Iowa	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	311	52	0.0205	0.0295	WL	IL
1439	3748001	0060321	8/31/2027	PATON CITY OF STP	Greene	4	NORTH RACCOON R.	1	WASTE STABILIZATION	489	81.6		0.048	WL	IL
1440	6151001	0062961	7/31/2027	PATTERSON CITY OF STP	Madison	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	407	68		0.04	WL	IL
1441	5100501	0052961	7/31/2024	PEKIN COMMUNITY SCHOOL DISTRICT	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	309	51.6	0.016	0.0161		
1442	2800901	0065854	1/31/2016	PENN CENTER, INC.	Delaware	1	MAQUOKETA R.	1	WASTE STABILIZATION	63	10		0.007		
1443	4360001	0073881	1/31/2016	PERSIA STP (REGIONAL WATER INC.)	Harrison	4	BOYER R.	1	WASTE STABILIZATION	317	53		0.0312	WL	IL
1444	2853001	0079740	8/31/2026	PETERSBURG, CITY OF STP (EIRUSS)	Delaware	1	MAQUOKETA R.	1	WASTE STABILIZATION	231	38.6	0.013	0.021	WL	IL
1445	2154002	0033677	4/30/2028	PETERSON CITY OF STP	Clay	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	553	92.3		0.065	WL	IL
1446	9766002	0033685	3/31/2016	PIERSON CITY OF STP	Woodbury	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	500	84		0.05	WL	IL
1447	0862001	0058530	6/30/2024	PILOT MOUND CITY OF STP	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	278	46.5		0.031	WL	IL
1448	1600201	0069043	3/31/2016	PILOT TRAVEL CENTERS #496	Cedar	6	CEDAR R. BELOW CEDAR RAPIDS	1	WASTE STABILIZATION	64	11		0.0034		
1449	4364001	0057827	1/31/2023	PISGAH CITY OF STP	Harrison	4	SOLDIER R.	2	WASTE STABILIZATION	336	56.1	0.0215	0.0675	WL	IL
1450	0960001	0033693	12/31/2022	PLAINFIELD CITY OF STP	Bremer	1	CEDAR R. ABOVE THE SHELLROCK R.	1	WASTE STABILIZATION	569	95	0.022	0.034	WL	IL
1451	0484001	0080845	2/28/2025	PLANO, IOWA-ADLM-FMS	Appanoose	5	CHARITON R.	1	WASTE STABILIZATION	61	10.2	0.0045	0.006	WL	IL
1452	5171001	0082554	8/31/2015	PLEASANT PLAIN CITY OF STP (RUSS)	Jefferson	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	202	34	0.015	0.0198	WL	IL
1453	1363001	0032824	6/30/2022	POMEROY CITY OF STP	Calhoun	3	NORTH RACCOON R.	2	WASTE STABILIZATION	725	121	0.055	0.162	WL	IL
1454	8365001	0072443	1/31/2025	PORTSMOUTH CITY OF STP	Shelby	4	PIGEON AND MOSQUITO CR.S	1	WASTE STABILIZATION	244	40.8	0.02	0.02	WL	IL
1455	3300901	0061875	6/30/2027	PRAIRIE VIEW CARE FACILITY	Fayette	1	TURKEY R.	1	WASTE STABILIZATION	162	27		0.0105		
1456	5772001	0063347	5/31/2025	PRAIRIEBURG CITY OF STP	Linn	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	383	64		0.031	WL	IL
1457	0270001	0033456	4/30/2027	PRESCOTT CITY OF STP	Adams	4	EAST NODAWAY R.	1	WASTE STABILIZATION	599	100	0.05	0.0677	WL	IL
1458	7155001	0033031	7/31/2022	PRIMGHAR CITY OF STP	O'Brien	3	LITTLE SIOUX R.	2	WASTE STABILIZATION	976	163		0.1224	WL	IL
1459	9360001	0082007	1/31/2028	PROMISE CITY, CITY OF STP	Wayne	5	CHARITON R.	1	WASTE STABILIZATION	149	24.95	0.0077	0.0126	WL	IL

1460	4552001	0061352	10/31/2016	PROTIVIN CITY OF STP	Howard	1	TURKEY R.	1	WASTE STABILIZATION	497	83		0.0462	WL	IL
1461	2662001	0074802	1/31/2025	PULASKI, CITY OF STP	Davis	6	FOX AND WYACONDA R.S	1	WASTE STABILIZATION	269	45		0.0262	WL	IL
1462	4800103	0072044	6/30/2024	QUANTUM PLASTICS	Iowa	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	92	15				
1463	1855001	0042994	8/31/2026	QUIMBY CITY OF STP	Cherokee	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	455	76		0.041	WL	IL
1464	4283001	0033707	4/30/2017	RADCLIFFE CITY OF STP	Hardin	2	IOWA R. ABOVE ALBION	2	WASTE STABILIZATION	649	108		0.0899	WL	IL
1465	9575001	0062804	9/30/2022	RAKE CITY OF STP	Winnebago	2	BLUE EARTH R.	1	WASTE STABILIZATION	561	93.75		0.0408	WL	IL
1466	3649001	0062979	8/31/2025	RANDOLPH CITY OF STP	Fremont	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	274	46	0.0255	0.0255	WL	IL
1467	5071001	0047775	3/31/2026	REASNOR CITY OF STP	Jasper	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	285	48	0.018	0.0285	WL	IL
1468	2564001	0036099	5/31/2027	REDFIELD CITY OF STP	Dallas	5	MIDDLE AND SOUTH RACCOON R.S	1	WASTE STABILIZATION	1174	196		0.142	WL	IL
1469	1170001	0033219	8/31/2027	REMBRANDT CITY OF STP	Buena Vista	3	NORTH RACCOON R.	1	WASTE STABILIZATION	407	68	0.0267	0.0299	WL	IL
1470	1100106	0076554	11/30/2023	REMBRANDT ENTERPRISES, INC.	Buena Vista	3	NORTH RACCOON R.	3	WASTE STABILIZATION	96	16	0.0075	0.0075		
1471	9969001	0032760	2/28/2023	RENWICK CITY OF STP	Wright	2	BOONE R.	1	WASTE STABILIZATION	2910	486		0.096	WL	IL
1472	6480001	0036960	5/31/2026	RHODES CITY OF STP	Marshall	5	SKUNK R. ABOVE THE NORTH SKUNK	2	WASTE STABILIZATION	862	144	0.035	0.118	WL	IL
1473	6670001	0032514	11/30/2023	RICEVILLE CITY OF STP	Mitchell	2	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	1437	240		0.12	WL	IL
1474	5470001	0061328	7/31/2027	RICHLAND CITY OF STP	Keokuk	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	802	134		0.0722	WL	IL
1475	3175001	0066311	11/30/2026	RICKARDSVILLE CITY OF STP	Dubuque	1	LITTLE MAQUOKETA R.	1	WASTE STABILIZATION	254	42		0.025	WL	IL
1476	9680001	0058726	1/31/2023	RIDGEWAY CITY OF STP	Winneshiek	1	UPPER IOWA R.	1	WASTE STABILIZATION	359	60		0.0289	WL	IL
1477	3275001	0057436	4/30/2023	RINGSTED CITY OF STP	Emmet	3	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	647	108		0.077	WL	IL
1478	3754001	0041882	2/29/2028	RIPPEY CITY OF STP	Greene	4	NORTH RACCOON R.	1	WASTE STABILIZATION	419	70	0.0419	0.0419	WL	IL
1479	3655001	0077097	1/31/2027	RIVERTON, CITY OF-STP	Fremont	4	EAST NISHNABOTNA R.	1	WASTE STABILIZATION	311	52		0.0304	WL	IL
1480	1769001	0063495	8/31/2023	ROCK FALLS CITY OF STP	Cerro Gordo	2	SHELLROCK R.	1	WASTE STABILIZATION	198	33	0.0155	0.0155	WL	IL
1481	3430001	0058432	9/30/2027	ROCKFORD CITY OF STP	Floyd	2	SHELLROCK R.	1	WASTE STABILIZATION	1461	244		0.12	WL	IL
1482	1773001	0033481	10/31/2027	ROCKWELL, CITY OF STP	Cerro Gordo	2	WEST FORK CEDAR R.	1	WASTE STABILIZATION	1569	262		0.152	WL	IL
1483	7639001	0032310	2/28/2025	ROLFE CITY OF STP	Pocahontas	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	2	WASTE STABILIZATION	689	115		0.123	WL	IL
1484	8500606	0067857	1/31/2025	ROLLING HILLS MOBILE HOME PARK	Story	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	291	49		0.021		
1485	4475001	0072427	1/31/2016	ROME CITY OF STP	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	126	21		0.0124	WL	IL
1486	6279001	0072311	2/28/2027	ROSE HILL CITY OF STP	Mahaska	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	174	29		0.0171	WL	IL
1487	1080001	0043672	9/30/2027	ROWLEY CITY OF STP	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	431	72		0.0427	WL	IL
1488	2166001	0035408	11/30/2016	ROYAL CITY OF STP	Clay	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	509	85	0.049	0.069	WL	IL
1489	3440001	0061344	5/31/2016	RUDD CITY OF STP	Floyd	2	SHELLROCK R.	1	WASTE STABILIZATION	670	112		0.0565	WL	IL
1490	4675001	0061239	2/28/2022	RUTLAND CITY OF STP	Humboldt	2	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	WASTE STABILIZATION	263	44		0.0262	WL	IL
1491	2864001	0041785	3/31/2025	RYAN CITY OF STP	Delaware	1	MAQUOKETA R.	1	WASTE STABILIZATION	458	77	0.041	0.105	WL	IL
1492	3181501	0077984	4/30/2027	SAGEVILLE SCHOOL STP	Dubuque	1	LITTLE MAQUOKETA R.	1	WASTE STABILIZATION	83	14	0.0044	0.0056		
1493	9176001	0072451	9/30/2024	SAINT MARYS CITY OF STP	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	162	27		0.012	WL	IL
1494	4478001	0047996	1/31/2023	SALEM CITY OF STP	Henry	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	485	81	0.0468	0.092	WL	IL
1495	9770001	0032913	8/31/2023	SALIX CITY OF STP	Woodbury	3	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	WASTE STABILIZATION	569	95		0.0544	WL	IL
1496	6800602	0064041	6/30/2023	SAMPLES COVENANT PARK	Monroe	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	54	9		0.0042		
1497	5600608	0065391	3/31/2019	SANDUSKY MOBILE HOME VILLAGE	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	WASTE STABILIZATION	18	3	0.0012	0.0013		
1498	2200901	0065749	8/31/2016	SCENIC ACRES CARE FACILITY	Clayton	1	TURKEY R.	2	WASTE STABILIZATION	135	23		0.0131		
1499	8156001	0042935	2/28/2027	SCHALLER CITY OF STP	Sac	3	MAPLE R.	1	WASTE STABILIZATION	796	133	0.0775	0.092	WL	IL
1500	7955001	0062553	7/31/2025	SEARSBORO CITY OF STP	Poweshiek	5	NORTH SKUNK R.	1	WASTE STABILIZATION	299	50		0.028	WL	IL
1501	9368001	0055301	3/31/2016	SEYMOUR CITY OF STP	Wayne	5	CHARITON R.	1	WASTE STABILIZATION	1096	183		0.11	WL	IL
1502	7380001	0069477	6/30/2020	SHAMBAUGH CITY OF STP	Page	4	NODAWAY R.	1	WASTE STABILIZATION	254	42.5		0.025	WL	IL
1503	8770001	0076571	5/31/2016	SHARPSBURG,CITY-STP-(SIRWA)	Taylor	4	HUNDRED AND TWO	1	WASTE STABILIZATION	122	20.4	0.012	0.012	WL	IL
1504	8369001	0036579	8/31/2020	SHELBY CITY OF STP	Shelby	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	695	116		0.123	WL	IL
1505	3183001	0056952	10/31/2027	SHERRILL CITY OF STP (EAST)	Dubuque	1	LITTLE MAQUOKETA R.	2	WASTE STABILIZATION	359	60		0.03	WL	IL
1506	7245001	0032841	7/31/2025	SIBLEY CITY OF STP	Osceola	3	ROCK R.	1	WASTE STABILIZATION	13772	2300	0.433	0.736	WL	IL
1507	3661001	0035971	9/30/2027	SIDNEY CITY OF STP	Fremont	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	1569	262	0.116	0.123	WL	IL
1508	6575001	0079774	5/31/2027	SILVER CITY, CITY OF STP	Mills	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	305	51	0.03	0.04	WL	IL
1509	9783001	0056341	4/30/2026	SMITHLAND CITY OF STP	Woodbury	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	311	52		0.0347	WL	IL
1510	6749001	0061743	10/31/2023	SOLDIER CITY OF STP	Monona	4	SOLDIER R.	1	WASTE STABILIZATION	341	57	0.0325	0.048	WL	IL
1511	5478001	0084018	9/30/2022	SOUTH ENGLISH, CITY OF STP	Keokuk	6	NORTH SKUNK R.	1	WASTE STABILIZATION	234	39.1		0.023	WL	IL
1512	1100701	0083305	2/28/2017	SOUTH WEST SHORELINE SANITARY DISTRICT	Buena Vista	3	NORTH RACCOON R.	1	WASTE STABILIZATION	353	59		0.048	WL	IL
1513	8000702	0083968	9/30/2023	SOUTHWEST RINGGOLD COUNTY WWTF - SIRWA	Ringgold	4	GRAND R.	1	WASTE STABILIZATION	183	31		0.018	WL	IL
1514	9686001	0042749	6/30/2026	SPILLVILLE CITY OF STP	Winneshiek	1	TURKEY R.	1	WASTE STABILIZATION	614	103	0.022	0.0447	WL	IL
1515	4984001	0033154	8/31/2022	SPRINGBROOK CITY OF STP	Jackson	1	MAQUOKETA R.	2	WASTE STABILIZATION	91	15.24	0.0106	0.0112	WL	IL
1516	5782002	0064726	4/30/2026	SPRINGVILLE CITY OF STP	Linn	1	CEDAR R. BELOW CEDAR RAPIDS	1	WASTE STABILIZATION	2754	460	0.26	0.3	WL	IL
1517	6161001	0039896	11/30/2020	ST CHARLES CITY OF STP	Madison	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	2	WASTE STABILIZATION	1222	204	0.096	0.12	WL	IL
1518	4979001	0040304	11/30/2022	ST DONATUS CITY OF STP	Jackson	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	WASTE STABILIZATION	300	50		0.03	WL	IL
1519	5675001	0076716	6/30/2016	ST PAUL CITY OF STP	Lee	6	MISSISSIPPI R. NEAR FORT MADISON	1	WASTE STABILIZATION	180	30		0.0165	WL	IL
1520	6482001	0077291	9/30/2018	ST. ANTHONY CITY OF (IRUA)	Marshall	5	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	114	19		0.0112	WL	IL
1521	3368001	0074705	5/31/2023	ST. LUCAS CITY OF STP	Fayette	1	TURKEY R.	1	WASTE STABILIZATION	216	36	0.017	0.021	WL	IL
1522	6677001	0035254	10/31/2026	STACYVILLE, CITY OF STP	Mitchell	2	CEDAR R. ABOVE THE SHELLROCK R.	1	WASTE STABILIZATION	760	127		0.158	WL	IL
1523	4045001	0032743	1/31/2025	STANHOPE CITY OF STP	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	754	126	0.051	0.085	WL	IL
1524	1089001	0054178	11/30/2025	STANLEY CITY OF STP	Buchanan	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	218	36	0.0115	0.02	WL	IL
1525	6965001	0042978	9/24/2014	STANTON CITY OF STP	Montgomery	4	TARKIO R.	1	WASTE STABILIZATION	857	143	0.062	0.0727	WL	IL
1526	3300501	0053234	1/31/2026	STARMONT COMMUNITY SCHOOL DISTRICT	Fayette	1	TURKEY R.	1	WASTE STABILIZATION	161	26.9	0.0158	0.0158		
1527	8973001	0061603	5/31/2016	STOCKPORT CITY OF STP	Van Buren	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	541	90		0.0463	WL	IL
1528	7063001	0033464	1/31/2016	STOCKTON CITY OF STP	Muscatine	6	CEDAR R. BELOW CEDAR RAPIDS	1	WASTE STABILIZATION	359	60		0.04	WL	IL
1529	3880001	0084107	6/30/2017	STOUT CITY OF STP	Grundy	2	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	WASTE STABILIZATION	221	36.9	0.016	0.0217	WL	IL
1530	9480001	0035980	2/29/2028	STRATFORD CITY OF STP	Webster	2	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	1156	193	0.12	0.155	WL	IL
1531	5200907	0083674	7/31/2024	SUGAR BOTTOM RECREATION AREA	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	102	17		0.0073		
1532	8000701	0069469	6/30/2020	SUN VALLEY SANITARY DISTRICT LAGOON	Ringgold	4	THOMPSON R.	2	WASTE STABILIZATION	988	165		0.076	WL	IL
1533	3100400	0068748	9/30/2026	SUNDOWN MOUNTAIN RESORT	Dubuque	1	LITTLE MAQUOKETA R.	2	WASTE STABILIZATION	45	7.5	0.0008	0.0028		
1534	4000702	0076864	1/31/2023	SUPER 8	Hamilton	2	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	42	6.98		0.0029		
1535	7177001	0036129	3/31/2027	SUTHERLAND CITY OF STP	O'Brien	3	LITTLE SIOUX R.	2	WASTE STABILIZATION	713	119	0.07	0.2775	WL	IL
1536	1778001	0073903	2/28/2023	SWALEDALE, CITY STP	Cerro Gordo	2	WEST FORK CEDAR R.	1	WASTE STABILIZATION	204	34	0.02	0.02	WL	IL

1537	5584001	0047813	5/31/2023	SWEA CITY CITY OF STP	Kossuth	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	970	162		0.063	WL	IL
1538	3667001	0038440	4/30/2020	TABOR CITY OF STP	Fremont	4	WEST NISHNABOTNA R.	1	WASTE STABILIZATION	1150	192	0.117	0.15	WL	IL
1539	1479001	0033782	12/31/2026	TEMPLETON CITY OF STP	Carroll	4	EAST NISHNABOTNA R.	1	WASTE STABILIZATION	491	82		0.1	WL	IL
1540	3500900	0062472	9/30/2021	TERRACE HILL SANITARY DISTRICT STP	Franklin	2	WEST FORK CEDAR R.	1	WASTE STABILIZATION	150	25	0.0075	0.0135	WL	IL
1541	3080001	0036609	3/31/2028	TERRIL CITY OF STP	Dickinson	3	LITTLE SIOUX R.	2	WASTE STABILIZATION	462	77.2	0.0467	0.061	WL	IL
1542	8858001	0079936	3/31/2027	THAYER CITY OF STP	Union	4	THOMPSON R.	1	WASTE STABILIZATION	73	12.2		0.0072	WL	IL
1543	7700911	0066966	3/31/2025	THOMAS MITCHELL PARK	Polk	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	60	10	0.0031	0.0031		
1544	9585001	0068683	2/28/2023	THOMPSON CITY OF STP	Winnebago	2	WINNEBAGO R.	1	WASTE STABILIZATION	810	135		0.0742	WL	IL
1545	4680001	0058581	12/31/2026	THOR CITY OF STP	Humboldt	2	BOONE R.	1	WASTE STABILIZATION	290	49		0.0285	WL	IL
1546	1781001	0033201	1/31/2023	THORNTON CITY OF STP	Cerro Gordo	2	WEST FORK CEDAR R.	1	WASTE STABILIZATION	718	120	0.0718	0.0718	WL	IL
1547	8800401	0074594	8/31/2019	THREE MILE LAKE CAMPGROUND-STP	Union	4	GRAND R.	1	WASTE STABILIZATION	59	10	0.0045	0.0045		
1548	5200311	0070076	6/30/2021	TIMBERLAKE HOMEOWNERS ASSOCIATION	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	77	13	0.0037	0.0075		
1549	2900606	0068250	3/31/2016	TIMBERLINE ESTATES, LTD	Des Moines	6	FLINT R.	1	WASTE STABILIZATION	515	86		0.0515		
1550	8080001	0074471	8/31/2022	TINGLEY, CITY-OF-STP-SIRWA	Ringgold	4	GRAND R.	1	WASTE STABILIZATION	180	30		0.0177	WL	IL
1551	5588001	0033375	10/31/2023	TITONKA CITY OF STP	Kossuth	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	763	127.5	0.07	0.115	WL	IL
1552	6382001	0081647	8/31/2026	TRACY CITY OF STP (MAHASKA RURAL WATER SYSTEMS, INC.)	Marion	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	263	44	0.0191	0.0255	WL	IL
1553	5786901	0041262	1/31/2024	TROY MILLS SANITARY DISTRICT	Linn	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	437	73		0.04	WL	IL
1554	6309500	0067041	6/30/2016	TWIN CEDARS COMMUNITY SCHOOL	Marion	5	DES MOINES R. BELOW WHITEBREAST CR.	1	WASTE STABILIZATION	225	38		0.015		
1555	1300903	0070114	1/31/2025	TWIN LAKES UTILITIES STP	Calhoun	3	NORTH RACCOON R.	1	WASTE STABILIZATION	898	150	0.0616	0.0616	WL	IL
1556	3100300	0061298	3/31/2024	TWIN RIDGE SUBDIVISION	Dubuque	1	MISSISSIPPI R. FROM DUBUQUE TO THE MAQUOKETA	1	WASTE STABILIZATION	305	51		0.03	WL	IL
1557	5200908	0084298	10/31/2023	U.S. ARMY - CORALVILLE DAM	Johnson	6	IOWA R. BELOW ALBION AND ABOVE NORTH LIBERTY	1	WASTE STABILIZATION	54	9	0.0012	0.0116		
1558	4291001	0034266	8/31/2020	UNION CITY OF STP	Hardin	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	640	106		0.064	WL	IL
1559	0497001	0074373	3/31/2028	UNIONVILLE, CITY OF STP	Appanoose	5	FOX AND WYACONDA R.S	1	WASTE STABILIZATION	138	23		0.0112	WL	IL
1560	0800500	0067181	6/30/2027	UNITED COMMUNITY SCHOOL	Boone	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	104	17		0.0037		
1561	2900103	0063606	3/31/2019	UNITED STATES GYPSUM COMPANY	Des Moines	6	FLINT R.	1	WASTE STABILIZATION	22	3.7		0.0058		
1562	6290001	0047741	5/31/2025	UNIVERSITY PARK CITY OF STP	Mahaska	5	SKUNK R. ABOVE THE NORTH SKUNK	1	WASTE STABILIZATION	728	122		0.0645	WL	IL
1563	1200107	0072231	6/30/2019	UNVERFERTH MFG. CO., INC.	Butler	2	CEDAR R. ABOVE THE SHELLROCK R.	2	WASTE STABILIZATION	49	8.1	0.0041	0.0051		
1564	6762001	0043010	11/30/2026	UTE CITY OF STP	Monona	4	SOLDIER R.	1	WASTE STABILIZATION	587	98		0.0587	WL	IL
1565	2452001	0032654	9/30/2026	VAIL CITY OF STP	Crawford	4	BOYER R.	2	WASTE STABILIZATION	599	100	0.028	0.05	WL	IL
1566	4000104	0070033	8/31/2022	VAN DIEST SUPPLY COMPANY	Hamilton	2	BOONE R.	2	WASTE STABILIZATION	275	45	0.019	0.037		
1567	2570001	0036021	8/31/2027	VAN METER CITY OF STP	Dallas	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	1	WASTE STABILIZATION	1347	225		0.1518	WL	IL
1568	2783001	0066354	8/31/2024	VAN WERT CITY OF STP	Decatur	5	THOMPSON R.	1	WASTE STABILIZATION	305	51	0.024	0.03	WL	IL
1569	9486001	0032930	11/30/2026	VINCENT CITY OF STP	Webster	2	BOONE R.	1	WASTE STABILIZATION	323	54		0.0323	WL	IL
1570	2285001	0062952	7/31/2023	VOLGA CITY OF STP	Clayton	1	TURKEY R.	1	WASTE STABILIZATION	365	61		0.034	WL	IL
1571	3371001	0032492	3/31/2023	WADENA, CITY OF STP	Fayette	1	TURKEY R.	1	WASTE STABILIZATION	265	44.2		0.0437	WL	IL
1572	8166001	0033065	5/31/2022	WALL LAKE CITY OF STP	Sac	3	BOYER R.	1	WASTE STABILIZATION	1159	193.6	0.082	0.107	WL	IL
1573	3290001	0062812	3/31/2023	WALLINGFORD CITY OF STP	Emmet	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	WASTE STABILIZATION	305	51		0.03	WL	IL
1574	0700904	0074241	10/31/2023	WASHBURN AREA-STP BLACK HAWK COUNTY	Black Hawk	1	CEDAR R. BELOW THE SHELLROCK R. THRU CEDAR RAPIDS	1	WASTE STABILIZATION	1407	235	0.1175	0.1175	WL	IL
1575	1880001	0043001	5/31/2024	WASHTA CITY OF STP	Cherokee	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	482	81		0.045	WL	IL
1576	0397001	0063517	8/31/2022	WATERVILLE CITY OF STP	Allamakee	1	YELLOW R. AND PAINT CR.	1	WASTE STABILIZATION	234	39	0.021	0.021	WL	IL
1577	2178001	0083666	5/31/2023	WEBB, CITY OF STP	Clay	3	LITTLE SIOUX R.	1	WASTE STABILIZATION	193	32.3	0.0147	0.019	WL	IL
1578	5491001	0078719	12/31/2026	WEBSTER, CITY OF STP	Keokuk	6	IOWA R. BELOW NORTH LIBERTY	1	WASTE STABILIZATION	126	21	0.012	0.012	WL	IL
1579	2788001	0069167	5/31/2022	WELDON CITY OF STP	Decatur	5	THOMPSON R.	1	WASTE STABILIZATION	293	49		0.0212	WL	IL
1580	5592001	0033472	8/31/2017	WESLEY CITY OF STP	Kossuth	2	BOONE R.	1	WASTE STABILIZATION	641	107		0.063	WL	IL
1581	9100401	0075523	12/31/2027	WESLEY WOODS CAMP & RETREAT CENTER	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	120	20		0.0029		
1582	7470001	0036994	10/31/2024	WEST BEND CITY OF STP	Palo Alto	3	DES MOINES R. ABOVE THE EAST FORK DES MOINES	1	WASTE STABILIZATION	1090	182	0.141	0.25	WL	IL
1583	1600600	0067946	5/21/2014	WEST BRANCH MOBILE HOME	Cedar	6	CEDAR R. BELOW CEDAR RAPIDS	1	WASTE STABILIZATION	635	108		0.0318		
1584	9281001	0072460	12/31/2026	WEST CHESTER CITY OF STP	Washington	6	SKUNK R. BELOW THE NORTH SKUNK	1	WASTE STABILIZATION	180	30	0.017	0.017	WL	IL
1585	7589001	0042960	4/30/2024	WESTFIELD CITY OF STP	Plymouth	3	BIG SIOUX R. BELOW THE ROCK	1	WASTE STABILIZATION	234	39		0.0176	WL	IL
1586	3379001	0075353	4/30/2025	WESTGATE, CITY OF-STP	Fayette	1	WAPSIPINICON R. ABOVE ANAMOSA	1	WASTE STABILIZATION	210	35	0.021	0.021	WL	IL
1587	2458001	0040274	10/31/2026	WESTSIDE CITY OF STP	Crawford	4	BOYER R.	1	WASTE STABILIZATION	386	65	0.0375	0.0417	WL	IL
1588	6769001	0032719	1/31/2027	WHITING CITY OF STP	Monona	4	MISSOURI R. FROM SIOUX CITY TO THE LITTLE SIOUX	1	WASTE STABILIZATION	1084	181	0.12	0.21	WL	IL
1589	5595001	0033430	9/30/2024	WHITTEMORE CITY OF STP	Kossuth	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	1102	184	0.095	0.16	WL	IL
1590	4293001	0062448	9/30/2018	WHITTEN CITY OF STP (IRUA)	Hardin	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	305	51		0.0276	WL	IL
1591	6100401	0048096	8/31/2026	Wildwood Hills Ranch	Madison	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	101	16.8		0.0028		
1592	4070001	0058483	5/31/2024	WILLIAMS CITY OF STP	Hamilton	2	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	772	129	0.065	0.11	WL	IL
1593	5946001	0076449	9/30/2016	WILLIAMSON CITY OF (RATHBUN REGIONAL WATER ASSN)	Lucas	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	180	30		0.0167	WL	IL
1594	9100601	0067903	2/28/2027	WILSHIRE MOBILE HOME PARK	Warren	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	126	21		0.0123		
1595	2300602	0068497	3/31/2027	WINDING BROOK MOBILE HOME PARK STP	Clinton	6	WAPSIPINICON R. BELOW ANAMOSA	1	WASTE STABILIZATION	92	15.3		0.0076		
1596	4100112	0067229	6/30/2025	WINNEBAGO INDUSTRIES, INC.	Hancock	2	WINNEBAGO R.	1	WASTE STABILIZATION	749					
1597	4170001	0084174	6/30/2028	WODEN CITY OF STP	Hancock	2	EAST FORK DES MOINES R.	1	WASTE STABILIZATION	247	41.3	0.024	0.0278	WL	IL
1598	4388001	0032387	10/31/2023	WOODBINE CITY OF STP	Harrison	4	BOYER R.	1	WASTE STABILIZATION	1862	311		0.152	WL	IL
1599	2052001	0075256	1/31/2023	WOODBURN CITY OF (SIRWA)	Clarke	5	DES MOINES R. BELOW THE RACCOON TO WHITEBREAST CR.	1	WASTE STABILIZATION	244	41	0.014	0.024	WL	IL
1600	0800901	0063916	6/30/2024	WOODWARD RESOURCE CENTER	Boone	5	DES MOINES R. BELOW THE EAST FORK DES MOINES	2	WASTE STABILIZATION	2132	356	0.1021	0.15		
1601	4071001	0061310	11/30/2021	WOOLSTOCK CITY OF STP	Hamilton	2	BOONE R.	1	WASTE STABILIZATION	325	54.23		0.0312	WL	IL
1602	8590001	0058513	1/31/2023	ZEARING CITY OF STP	Story	5	IOWA R. ABOVE ALBION	1	WASTE STABILIZATION	1437	240		0.12	WL	IL

Column

Permit #

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