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Antidegradation Alternatives Analysis

New Hampton
Wastewater Treatment Plant

City of New Hampton, Iowa

February 2024

PN 7035.002

STRAND ASSOCIATES®

Antidegradation Alternatives Analysis

for the

City of New Hampton, Iowa
Wastewater Treatment Plant

Prepared by:

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February 2024

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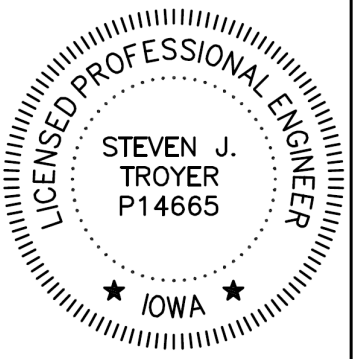
CERTIFICATION PAGE

CITY OF NEW HAMPTON, IOWA
WASTEWATER TREATMENT PLANT
ANTIDEGRADATION ALTERNATIVES ANALYSIS



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.

STEVEN J. TROYER, P.E. DATE
License number P14665

My license renewal date is December 31, 2024.

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EXECUTIVE SUMMARY

ES.01 INTRODUCTION

The City of New Hampton, Iowa (City) currently operates a trickling filter secondary treatment process wastewater treatment plant (WWTP). The WWTP was originally constructed in late 1963 and underwent upgrades in 1973, 1990, 1991, 1996, 1998, 2001, 2008, and 2015. The WWTP consists of flow equalization , grinding, grit collection, primary clarification, roughing filter, intermediate clarification, two trickling filters, two final clarifiers, sludge thickening, anaerobic digestion, and biosolids storage. The WWTP treats domestic and commercial waste from the City, as well as a large industrial load from several industries in the community. The plant discharge is regulated under National Pollutant Discharge Elimination System Permit (No. 1970001, as amended July 1, 2021) through Outfall 1 on Spring Branch, a tributary to the Little Wapsipinicon River, followed by the Wapsipinicon River.

As part of a facility planning effort, FOX Strand (now Strand Associates, Inc.® [Strand]) evaluated the condition, capacity, and performance of the WWTP. Strand also examined the ability of the existing trickling filters to meet future regulations and the goals of the Iowa Nutrient Reduction Strategy. As part of the evaluation, it was determined that the flows and loads to the WWTP will increase due to population and industrial growth over the 20-year design period. This increase in discharge to the receiving waters requires the development of an Antidegradation Alternative Analysis to evaluate the available options with an aim toward minimizing degradation of the stream.

ES.02 EXISTING CONDITIONS AND DESIGN PARAMETERS

The historical influent loadings to the WWTP were evaluated over the last 5 years. Wastewater flow and organic loadings were estimated and projected to the year 2045, including allowance for community and industrial growth. The proposed maximum month design capacity needs are as follows. Refer to Section 2 for details on current and projected wastewater flows and loads.

- Flow: 3.20 million gallons per day
- Biochemical Oxygen Demand: 4,733 pounds per day (lb/day)
- Total Suspended Solids: 3,824 lb/day
- Total Kjeldahl Nitrogen: 368 lb/day
- Phosphorous: 143 lb/day

ES.03 EXISTING FACILITIES

Section 3 contains a description of the existing treatment facilities and flow schematic.

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ES.04 IDENTIFICATION AND DISCUSSION OF ALTERNATIVES

Several alternatives to address the WWTP deficiencies are identified in Section 4. The alternatives evaluated in this report include the following.

- Alternative 1–Expand Existing Treatment Process and Add Nutrient Removal
- Alternative 2–Convert to an Aerated Granular Sludge System
- Alternative 3–Convert to an Aero-Mod® Activated Sludge System
- Alternative 4–Convert to an Oxidation Ditch Activated Sludge System
- Alternative 5–Convert to a Sequencing Batch Reactor (SBR) Activated Sludge System
- Alternative 6–Convert to an SBR Activated Sludge System and Aerobic Digestion
- Alternative 7–Implement Alternative 6 and Land Apply Effluent in Excess of Current Flows

ES.05 EVALUATION OF ALTERNATIVES

Section 5 includes an opinion of probable cost and net present cost (NPC) opinion for each alternative. Alternative 6 has the lowest capital cost opinion and NPC opinion.

ES.06 RECOMMENDATIONS AND IMPLEMENTATION

Alternative 6–Convert to an SBR Activated Sludge System with Aerobic Digestion is considered less-degrading. As the lowest cost alternative that will meet project objectives, it is considered the Base Pollution Control Alternative. Alternative 6 is the lowest cost alternative that is considered practicable, economically efficient, and reasonable and is recommended for implementation.

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SECTION 1–INTRODUCTION

1.01 BACKGROUND

The City of New Hampton, Iowa (City) currently operates a trickling filter secondary treatment process wastewater treatment plant (WWTP). The WWTP was originally constructed in late 1963 and underwent upgrades in 1973, 1990, 1991, 1996, 1998, 2001, 2008, and 2015. The WWTP consists of flow equalization (EQ), grinding, grit collection, primary clarification, roughing filter, intermediate clarification, two trickling filters, two final clarifiers, ultraviolet (UV) light disinfection, sludge thickening, anaerobic digestion, and biosolids storage. The WWTP treats domestic and light commercial and industrial waste from the City.

In November 2012, the Iowa Department of Natural Resources (Iowa DNR) created the Iowa Nutrient Reduction Strategy (NRS), which was revised in May 2013 and October 2014. The Iowa NRS requires communities with an average wet weather (AWW) flow of 1.0 million gallons per day (MGD) or greater to submit a report that evaluates the feasibility and reasonableness of reducing total nitrogen (TN) and total phosphorous (TP) discharged into surface waters. The City's new National Pollution Discharge Elimination System (NPDES) permit, issued June 1, 2019, requires that a nutrient reduction feasibility report be submitted by July 1, 2022. A copy of the new NPDES permit is included in Appendix A.

The City hired FOX Engineering Associates, Inc. (FOX Strand at the time of the facility plan; now Strand Associates, Inc.® [Strand]) to prepare a facility plan to evaluate the condition and performance of the existing system, identify deficiencies in need of improvement, and evaluate the feasibility of providing nutrient reduction. As part of this study, increases in population and industrial growth are projected, resulting in potential increases in the flows and loads the WWTP will receive during the planning period. An increase in flows and loads will likely cause an increase in the degradation of the receiving stream. Consequently, it is necessary to develop an Antidegradation Alternatives Analysis (AAA) in compliance with the State of Iowa's (Iowa) antidegradation policy (567 IAC 61.2(2)).

1.02 PURPOSE AND SCOPE

The purpose and scope of this AAA is to evaluate various treatment methods and identify the less degrading alternative (LDA) that is economically viable. The AAA has been developed in conjunction with the facility plan, which is intended to provide a more detailed review of plant deficiencies for current and anticipated future treatment requirements, along with evaluating the feasibility of nutrient reduction, specifically TN and TP.

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1.03 GENERAL DESCRIPTION OF THE FACILITIES

The City's WWTP is a trickling filter plant located at 800 South Locust Avenue in the City. The existing WWTP consists of preliminary treatment including flow EQ, grinders, a vortex grit chamber, a wet well, and four raw pumps; primary treatment consisting of one primary clarifier and one clariflotator; and secondary treatment consisting of a roughing filter, two intermediate clarifiers, two trickling filters, two final clarifiers, and UV light disinfection. The biosolids handling facilities consist of primary sludge pumping, one gravity thickener, two anaerobic digesters, and a biosolids storage tank. The facility treats domestic and commercial wastewater from the City, as well as a large industrial load from several industries in the community.

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SECTION 2–EXISTING CONDITIONS AND DESIGN PARAMETERS

2.01 WASTEWATER TREATMENT DEMANDS

The City is currently in substantial compliance with its NPDES permit and there are no enforceable schedules for improvements at this time. To estimate current wastewater flows and loadings, data from the City's monthly operating reports (MORs) were collected and evaluated for the time period of January 2016 to December 2020. Information from this set of data was used in conjunction with other general design criteria, to establish projected design flows and loadings anticipated for the end of the 20-year design period. The analysis procedure used, including the various assumptions that were made, is described in detail in the following.

2.01.1 Current and Projected Flows

To determine current wastewater flows, data from the WWTP's records was collected and evaluated for the period between January 2016 to December 2020. This is presented as "Existing Flow Data" in Table 2.1. The design flow parameters defined in the Iowa DNR Design Standards are summarized in the following:

- Average Dry Weather (ADW) Flow–The daily average flow when groundwater is at or near normal and runoff is not occurring.
- AWW Flow–The daily average flow for the wettest 30 consecutive days on record.
- Maximum Wet Weather (MWW) Flow–The total maximum flow received in a 24-hour period when groundwater is high and runoff is occurring.
- Peak Hour Wet Weather (PHWW) Flow–The total maximum flow received in 1 hour when the groundwater is high; runoff is occurring; and domestic, commercial, and industrial flows are at their peak.

Table 2.1 also shows the existing WWTP design flows ("1998 Construction Permit") and the projected design flows ("2045 Design Flows").

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Table 2.1–Existing and Projected Design Flows

Parameter	1998 Construction Permit	Existing Flow Data (2016 to 2020)	2045 Design Flows
AAF, MGD	NA	1.37	1.90
ADW Flow, MGD[1]	1.32	1.09	1.17
AWW Flow, MGD	2.20	2.66	3.20
MWW Flow, MGD	3.00	6.06	7.17
PHWW Flow, MGD	NA	9.00	9.00

[1]The proposed ADW flow was computed by averaging the average of flow data in each February from 2016 to 2020.
AAF=annual average flow
NA=not applicable

2.01.2 Current and Projected Loadings

The WWTP operating data provided by the City from January 2016 to December 2020 was reviewed to determine the current loadings and projected loadings for the design year 2045. Current and projected loadings are summarized in Table 2.2. Historical data was provided by Iowa DNR as reported by the City's MORs.

Table 2.2–Current and Projected Loadings

	1998 Construction Permit	Existing Loads (2016 to 2020)	2045 Design Loads
BOD_5, lb/day			
Annual Average		2,759	4,328
Maximum Month	12,300	4,099	4,733
Maximum Day		7,892	8,039
TSS, lb/day			
Annual Average		1,516	2,304
Maximum Month		3,430	3,824
Maximum Day		8,341	7,608
TKN, lb/day			
Annual Average		254	349
Maximum Month	362	371	368
Maximum Day		598	546
Phosphorous, lb/day			
Annual Average		56.4	64.0
Maximum Month		122.8	143.4
Maximum Day		144.6	167.6

BOD_5=5-day biochemical oxygen demand
lb/day=pounds per day
TSS=total suspended solids
TKN=total Kjeldahl nitrogen

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2.01.3 Anticipated Discharge Limits

Based on the aforementioned flows and loads, the Iowa DNR developed water quality-based effluent limits (WQBEL) as provided in the Wasteload Allocation Calculations & Notes (WLA), February 18, 2022 (see Appendix B). When the new NPDES permit is issued, the limits must be at least as stringent as those provided in the WLA, but may be more stringent based on available technology. The WQBELs for the primary pollutants of concern (POC) are provided in Table 2.3.

Table 2.3–Water Quality-Based Permit Limits

Parameters	Average Concentration (mg/L)	Maximum Concentration (mg/L)	Average Mass (lb/day)	Maximum Mass (lb/day)
Outfall No. 001	**ADW = 1.17 MGD and AWW = 3.2 MGD**			
$CBOD_5$	Secondary Treatment Levels Will Not Violate WQS			
COD	41	41	1,091	1,091
Total DO	Minimum Concentration (mg/L)			
January to December	5.0			
Ammonia-Nitrogen*				
January	3.6	15.2	92.7	405.6
February	4.2	14.2	107.5	379.1
March	3.6	14.7	92.7	392.2
April	1.6	15.7	41.5	419.2
May	1.8	15.2	47.3	405.5
June	1.4	14.5	35.6	385.6
July	1.1	15.6	27.4	360.3
August	1.0	14.7	26.0	341.6
September	1.1	16.5	28.8	440.3
October	1.6	15.7	42.3	419.2
November	2.4	14.7	63.2	392.1
December	2.6	16.0	67.4	426.2
Bacteria	Geometric Mean (#org./100 mL)		March 15 to November 15	
E. coli	212			
Chloride	394	630	10,420	16,791
Sulfate	1,516	1,516	40,417	40,417
TRC**	0.0080	0.019	0.21	0.51
Aluminum, Total	0.9023	2.503	23.87	66.75
Copper, Total	0.0171	0.02694	0.4524	0.7182
pH	6.5 to 9.0 Standard Units			

Notes:
**Only required if chlorine is used for disinfection.
mg/L=milligrams per liter
$CBOD_5$=5-day carbonaceous oxygen demand
WQS=water quality standard
COD=carbonaceous oxygen demand
DO=dissolved oxygen
#org./100 mL=number of organisms per 100 milliliters
TRC=total residual chlorine

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Limits of 10 mg/L for TN and 1.0 mg/L for TP are anticipated to be included in future NPDES permits as the Iowa NRS is applied.

2.01.4 Pollutants of Concern

Table 2.4 identifies the POCs and the associated tier protection level that may be present in the plant discharge.

Table 2.4–POCs and Tier Protection Level

POC	Secondary or WQBEL	Beneficial Use Affected	Tier	Notes
Organic Matter ($CBOD_5$)	Yes	Aquatic Life	2	See Table 6.1 for discharge alternative determinations of degradation
TSS	Yes	General Uses	2	
Ammonia Nitrogen	Yes	Aquatic Life	2	Compliance with WQBEL will not cause degradation
Bacteria (*E. coli*)	Yes	Contact Recreation	2	Spring Branch not currently listed as impaired, Tier 2 review level assumed
Chloride	Yes	Aquatic Life	2	
Sulfate	Yes	Aquatic Life	2	
TN	Yes	Human Health (drinking water), Aquatic Life (indirect), General Uses (nuisance aquatic life)	2	NRS-based limit
TP	Yes	Aquatic Life (indirect), General Uses (nuisance aquatic life)	2	NRS-based limit
Priority Pollutants	Yes	Human Health (drinking water), Aquatic Life (indirect)	2	Only aluminum and copper have anticipated effluent limits

2.02 RECEIVING STREAM NETWORK

The WWTP discharges into Spring Branch (a tributary to the Little Wapsipinicon River), the Wapsipinicon River, and ultimately to the Mississippi River before leaving Iowa. The stream designations are shown in Table 2.5

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Table 2.5–Current Stream Designations

Stream	Current Designation	Source
Spring Branch	A2, B(WW-2)	Surface Water Classification, July 24, 2019
Little Wapsipinicon River	A2, B(WW-2)	Surface Water Classification, July 24, 2019
Wapsipinicon River	A1, B(WW-1), HH	Surface Water Classification, July 24, 2019
Mississippi River	A1, B(WW-1), HH, C	Surface Water Classification, July 24, 2019

Designated use waters are to be protected for all uses of general use segments in addition to the specific uses assigned. Designated use segments include:

A. Primary Contact Recreational Use (Class "A1")

Class A1 includes waters in which recreational or other uses may result in prolonged and direct contact with the water, involving considerable risk 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.

B. Secondary Contact Recreational Use (Class "A2")

Class A2 includes 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.

C. Warm Water–Type 1 (Class "B(WW-1)")

Class B(WW-1) includes waters 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 invertebrate species. These waters generally include border rivers, large interior rivers, and the lower segments of medium-size tributary streams.

D. Warm Water–Type 2 (Class "B(WW-2)")

Class B(WW-2) includes 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.

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E. Human Health (Class "HH")

Class HH includes 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.

F. Drinking Water Supply (Class "C")

Class C includes which are used as a raw water source of potable water supply.

Table 2.6–UAA Status

Stream	UAA Type	Fieldwork Complete?	Recommended Designation(s)	Status
Spring Branch	Recreation and Aquatic	Yes	A2, B(WW-2)	Pending Rulemaking and USEPA Approval
Little Wapsipinicon River	Recreation and Aquatic	Yes	A2, B(WW-2)	Pending Rulemaking and USEPA Approval
Wapsipinicon River	Recreation and Aquatic	Yes	A1, B(WW-1), HH	Pending Rulemaking and USEPA Approval

UAA=Field Use Attainability Assessment
USEPA=United States Environmental Protection Agency

Table 2.7–Impairment Status

Stream	Impairment(s)	TMDL Status	Notes
Spring Branch	None	NA	Not Monitored
Little Wapsipinicon River	None	NA	Not Monitored
Wapsipinicon River	Bacteria	Not Scheduled	Multiple Downstream Segments
	Biological	Not Scheduled	Multiple Downstream Segments. Fish Kill Due to Unknown Pollutant
Mississippi River	Bacteria	Not Scheduled	Multiple Downstream Segments
	Arsenic	Not Scheduled	Multiple Downstream Segments
	Aluminum	Not Scheduled	Multiple Downstream Segments

2.03 WWTP DESIGN FLOW

The combination of WWTP capacity and EQ basin volume should be capable of handling, treating, or storing anticipated flows for up to a 10-year storm event. The design WWTP flow of 4.0 MGD was determined as the maximum flow required to be treated through the mechanical plant during a peak flow period, with all flows above that diverted to the flow EQ basin, without overflowing the EQ basin.

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SECTION 3–EXISTING FACILITIES

3.01 TREATMENT FACILITY–OVERVIEW

Wastewater flows to the City's WWTP through two separate interceptor sewers. The east interceptor sewer is commonly referred to as the "domestic" sewer, and the west interceptor sewer is commonly referred to as the "industrial" sewer because it carries the majority of the industrial wastewater flow, although it does serve a significant domestic portion of the City. The two interceptor sewers come together at the main lift station, which also provides preliminary treatment. It consists of two grinders (one for each interceptor sewer), two grit removal systems (one for each trunk sewer), two wet wells, and four raw wastewater pumps. Flows in excess of pumping capacity flow by gravity to the flow EQ basin. A return pumping station is provided to return flows from the EQ basin to the main lift station. From the main lift station, wastewater is pumped through two force mains to the WWTP. Flow measurement is provided by two Parshall flumes (one for each sewer) and two magnetic flow meters (one for each force main). Primary treatment consists of one primary clarifier that serves flows from the east (domestic) sewer and one clariflotator that serves mainly industrial flow from the west sewer. All flows are then combined for secondary treatment, which includes a covered roughing filter, two intermediate clarifiers, two covered trickling filters, and two final clarifiers. Treated effluent is disinfected with a non-contact UV system before discharge. Solids handling facilities include a gravity thickener, two anaerobic digesters, and a biosolids storage tank.

The City's trickling filter plant was originally constructed in 1963 with a grinder, raw wastewater pumping station, primary clarifier (existing sludge thickening tank), trickling filter (existing roughing filter), final clarifier (existing intermediate clarifier), and an anerobic digester. Another grinder (industrial sewer), clariflotator, two additional trickling filters, an intermediate clarifier, a final clarifier, two polishing ponds (one pond is currently used for stormwater EQ), and anaerobic digestion were added during the 1973 improvements project. A second final clarifier and primary sludge pumping station were added in 1989. Grit removal was added to each of the trunk sewers in 1990. A biosolids storage tank was added in 1991. The primary clarifier was converted to a sludge thickening tank and a new primary clarifier was added in 1998. The trickling filter rock media was also replaced, and a trickling filter recirculation pumping station and flow EQ basin were also added in 1998. In 2001, the roughing filter media was replaced. UV disinfection was added in 2015.

The existing treatment facility consists of multiple unit processes. Following is a discussion of the current condition, performance, capacity, and deficiencies of the existing treatment units at the WWTP. The WWTP consists of the following major unit processes:

- East (Domestic) Sewer
  - Grinder and manually cleaned bar screen
  - Grit removal
  - Raw pumping
  - Primary clarification

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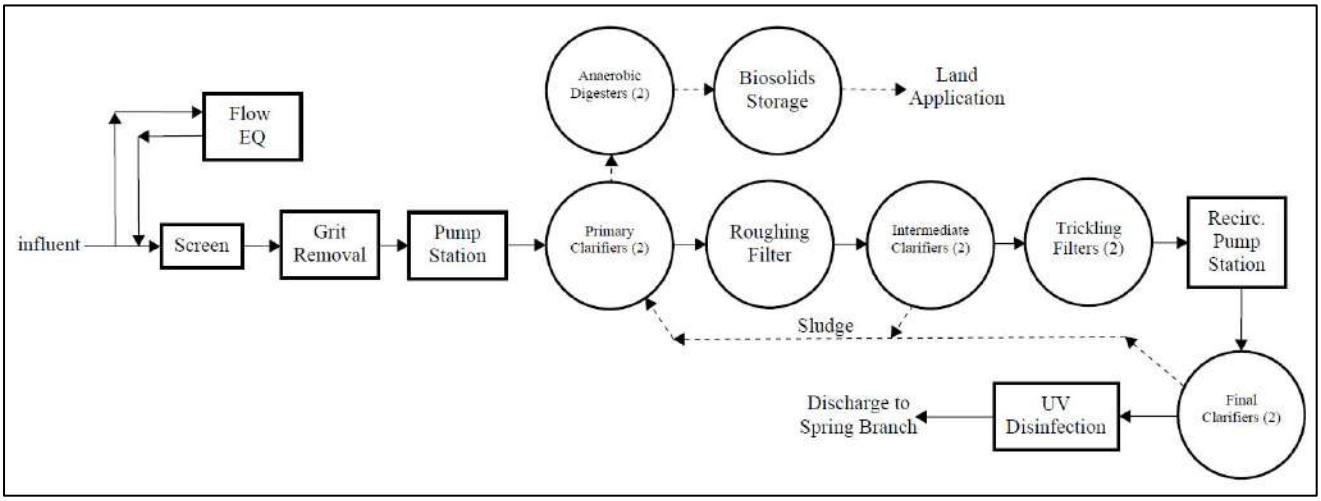
- West (Industrial) Sewer
  - Grinder and manually cleaned bar screen
  - Grit removal
  - Raw pumping
  - Clariflotator
- EQ basin and return pumping station
- Roughing filter
- Intermediate clarification
- Trickling filters
- Trickling filter recirculation
- Final clarification
- Disinfection
- Gravity sludge thickening
- Anaerobic digester
- Biosolids storage

A schematic of the existing WWTP is shown in Figure 3.1.

Figure 3.1–Existing WWTP Schematic



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SECTION 4–IDENTIFICATION AND DISCUSSION OF ALTERNATIVES

4.01 GENERAL

The WWTP is currently meeting effluent limits. However, the projected flows and loads exceed the WWTP capacity and there are significant deficiencies that have been identified with the existing WWTP. In addition, nutrient reduction should be implemented in the next major WWTP improvements project to comply with the Iowa NRS.

The following alternatives include improvements required to address deficiencies of the existing plant and meet the objectives of the Iowa NRS, new NPDES permit requirements, and increasing flows and loads.

Alternative	Description
1	Expand Existing Treatment Process and Add Nutrient Removal
2	Convert to an Aerated Granular Sludge (AGS) System
3	Convert to an Aero-Mod® Activated Sludge System
4	Convert to an Oxidation Ditch Activated Sludge System
5	Convert to a Sequencing Batch Reactor (SBR) Activated Sludge System
6	Convert to an SBR Activated Sludge System with Aerobic Digestion
7	Implement Alternative 6 and Land Apply Effluent in Excess of Current Flows

Schematics showing the improvements for each alternative can be found in the following sections. In order to keep the existing WWTP in operation while the new WWTP is under construction, Alternatives 2 through 7 will require additional property to the south or east of the existing site for the new facilities.

Because of the age and condition of the existing facilities, several of the alternative are based on replacing these existing facilities with an activated sludge process to meet the Iowa NRS goals. Alternative 1 considers upgrading the existing facility; however, the age and condition of many of the existing facilities (and the treatment limitations of the existing process) makes this less desirable. The following sections describe the proposed modifications for each alternative, organized by unit process.

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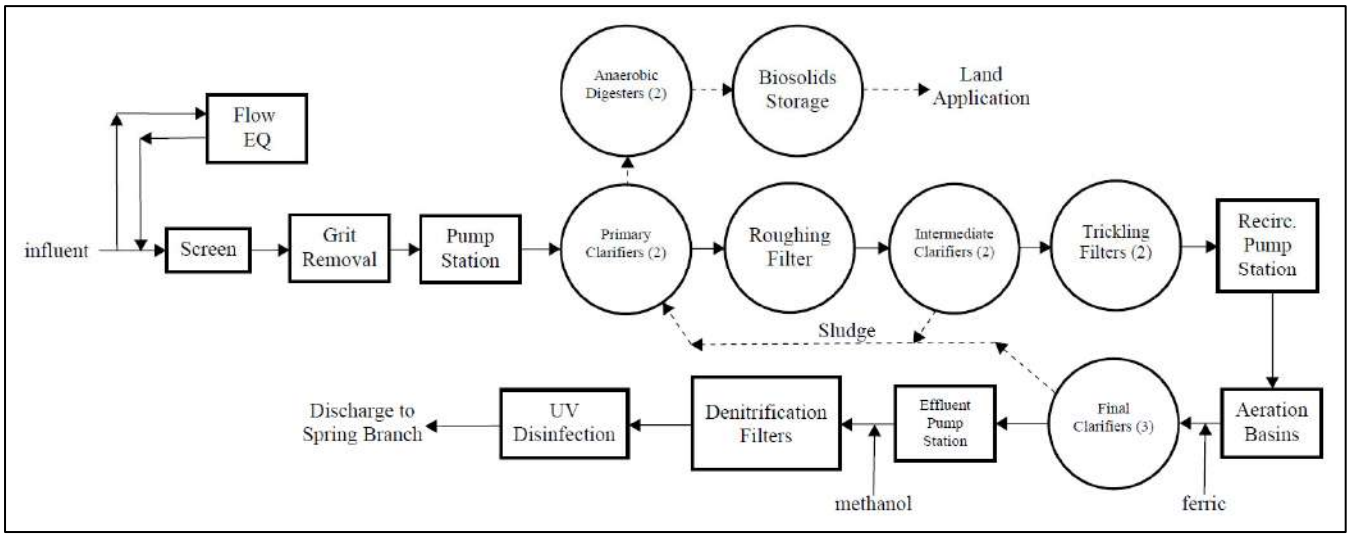
4.02 ALTERNATIVE 1–EXPAND EXISTING TREATMENT PROCESS AND ADD NUTRIENT REMOVAL

Under this option, the basic unit processes of the existing WWTP would remain in their current form with some unit processes being expanded and additional unit processes being added as required. This alternative includes expanding flow EQ, upgrading preliminary treatment to include screening and improved grit removal, replacing raw wastewater pumps, repairing the primary clarifier and clariflotator, refurbishing the roughing filter and trickling filters, adding aeration basins, repairing the intermediate clarifiers and one final clarifier, adding two new final clarifiers, and constructing an effluent pumping station. To meet the goals of the Iowa NRS, chemical addition would be provided for phosphorous reduction and denitrification filters would be added for nitrogen reduction. The existing UV system will be used for disinfection. Flow through the primary and secondary treatment processes would be limited to approximately 4.0 MGD. Additional wastewater would be diverted to a flow EQ basin. Improvements to the solids handling facilities include new sludge thickening, refurbishing the existing anaerobic digesters, and providing additional biosolids storage. A schematic is shown in Figure 4.1.

This alternative is considered an LDA because it includes chemical TP removal and denitrification to enhance TN removal with the intent of meeting future NRS induced limits.

Figure 4.1–Alternative 1 Schematic



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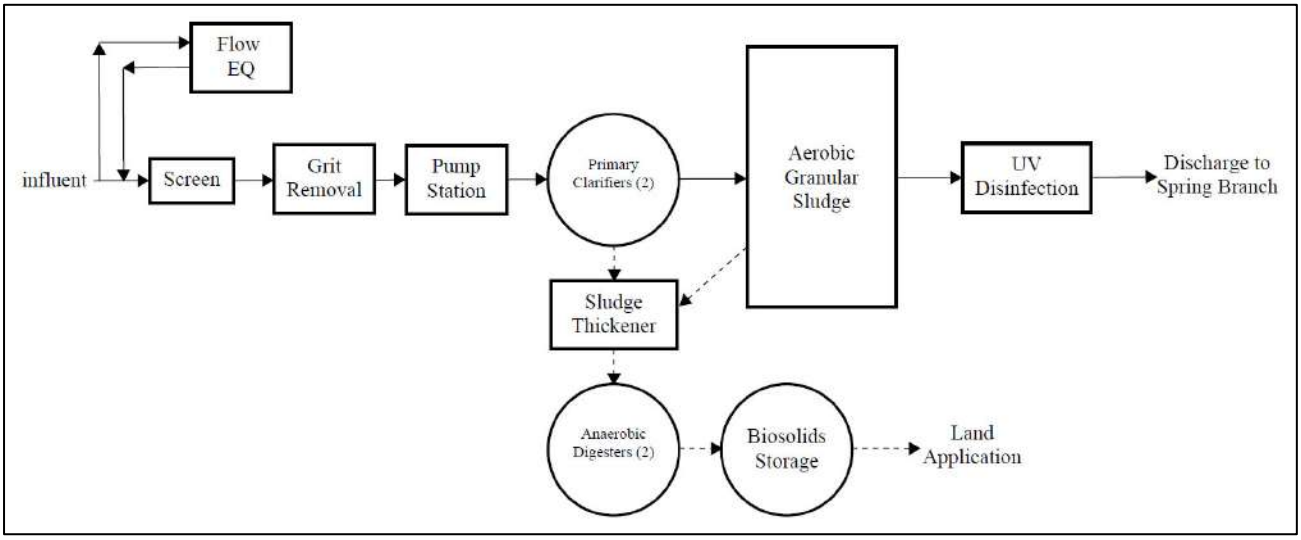
4.03 ALTERNATIVE 2–CONVERT TO AN AGS SYSTEM

Under this option, many of the unit processes of the existing WWTP would be removed from service and potentially demolished, including the roughing filter, roughing filter pumping station, intermediate clarifier(s), trickling filers, trickling filter pumping station, and final clarifiers. A new AGS activated sludge system would take the place of these unit processes while also providing biological nutrient removal (BNR). The AGS system would be designed to treat for removal of nitrogen and phosphorus and comply with the 10-mg/L TN and 1.0-mg/L TP effluent goals indicated in the Iowa NRS. This alternative includes expanding flow EQ, upgrading preliminary treatment to include screening and improved grit removal, replacing raw wastewater pumps, repairing the primary clarifier and clariflotator, constructing a new AGS system, and continued use of the existing UV disinfection system. Flow through the primary and secondary treatment processes would be limited to approximately 4.0 MGD. Additional wastewater would be diverted to a flow EQ basin. Improvements to the solids handling facilities include new sludge thickening, refurbishing the existing anaerobic digesters, and providing additional biosolids storage. A schematic is shown in Figure 4.2.

This alternative is considered an LDA by adding the AGS system for nutrient reduction.

Figure 4.2–Alternative 2 Schematic



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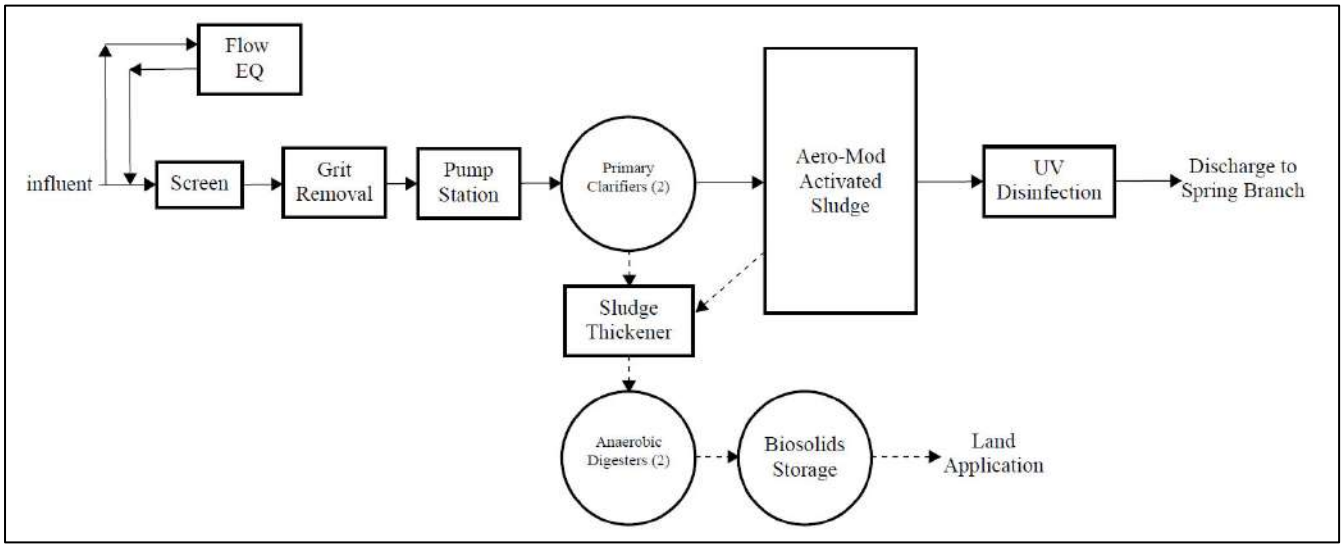
4.04 ALTERNATIVE 3–CONVERT TO AN AERO-MOD® ACTIVATED SLUDGE SYSTEM

Under this option, similar to Alternative 2, many of the unit processes of the existing WWTP would be removed from service and potentially demolished, including the roughing filter, roughing filter pumping station, intermediate clarifier(s), trickling filters, trickling filter pumping station, and final clarifiers. A new Aero-Mod® activated sludge system would take the place of these unit processes while also providing BNR. The Aero-Mod® system would be designed to treat for removal of nitrogen and phosphorus and comply with the 10-mg/L TN and 1.0-mg/L TP effluent goals indicated in the Iowa NRS. This alternative includes expanding flow EQ, upgrading preliminary treatment to include screening and improved grit removal, replacing raw wastewater pumps, repairing the primary clarifier and clariflotator, constructing a new Aero-Mod® activated sludge system, and continued use of the existing UV disinfection system. Flow through the primary and secondary treatment processes would be limited to approximately 4.0 MGD. Additional wastewater would be diverted to a flow EQ basin. Improvements to the solids handling facilities include new sludge thickening, refurbishing the existing anaerobic digesters, and providing additional biosolids storage. A schematic is shown in Figure 4.3.

This alternative is considered an LDA by designing the Aero-Mod® system to specifically target TN and TP reduction.

Figure 4.3–Alternative 3 Schematic



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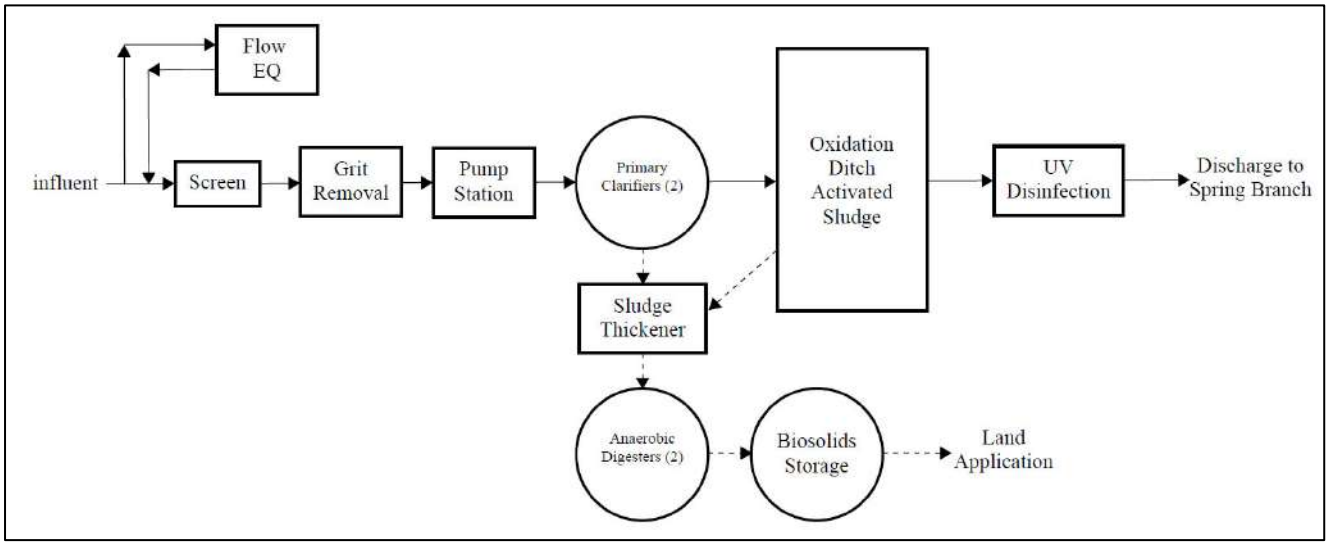
4.05 ALTERNATIVE 4–CONVERT TO AN OXIDATION DITCH ACTIVATED SLUDGE SYSTEM

Under this option, similar to Alternatives 2 and 3, many of the unit processes of the existing WWTP would be removed from service and potentially demolished, including the roughing filter, roughing filter pumping station, intermediate clarifier(s), trickling filers, trickling filter pumping station, and the west final clarifier. A new oxidation ditch activated sludge system would take the place of these unit processes while also providing BNR. The oxidation ditch system would be designed to treat for removal of nitrogen and phosphorus and comply with the 10-mg/L TN and 1.0-mg/L TP effluent goals indicated in the Iowa NRS. This alternative includes expanding flow EQ, upgrading preliminary treatment to include screening and improved grit removal, replacing raw wastewater pumps, repairing the primary clarifier and clariflotator, constructing a new oxidation ditch system, refurbishing one existing final clarifier and constructing two new final clarifiers, and continued use of the existing UV disinfection system. Flow through the primary and secondary treatment processes would be limited to approximately 4.0 MGD. Additional wastewater would be diverted to a flow EQ basin. Improvements to the solids handling facilities include new sludge thickening, refurbishing the existing anaerobic digesters, and providing additional biosolids storage. A schematic is shown in Figure 4.4.

Like Alternative 3, this alternative is considered an LDA by converting from a trickling filter plant to activated sludge with specific processes for TN and TP reduction.

Figure 4.4–Alternative 4 Schematic



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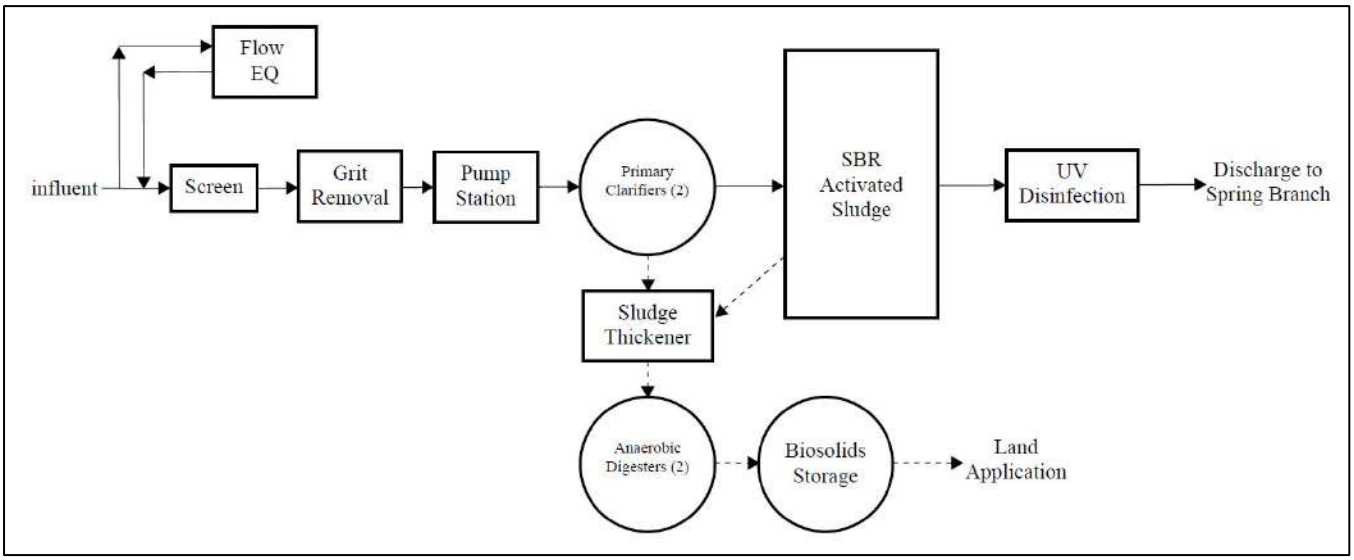
4.06 ALTERNATIVE 5–CONVERT TO SBR ACTIVATED SLUDGE

Under this option, similar to the previous alternatives, many of the unit processes of the existing WWTP would be removed from service and potentially demolished, including the roughing filter, roughing filter pumping station, intermediate clarifier(s), trickling filers, trickling filter pumping station, and final clarifiers. A new SBR would take the place of these unit processes while also providing BNR. The SBR system would be designed to treat for removal of nitrogen and phosphorus and comply with the 10-mg/L TN and 1.0-mg/L TP effluent goals indicated in the Iowa NRS. This alternative includes expanding flow EQ, upgrading preliminary treatment to include screening and improved grit removal, replacing raw wastewater pumps, repairing the primary clarifier and clariflotator, constructing a new SBR system, and continued use of the existing UV disinfection system. Flow through the primary and secondary treatment processes would be limited to approximately 4.0 MGD. Additional wastewater would be diverted to a flow EQ basin. Improvements to the solids handling facilities include new sludge thickening, refurbishing the existing anaerobic digesters, and providing additional biosolids storage. A schematic is shown in Figure 4.5.

As with similar alternatives, this alternative is considered an LDA by converting from a trickling filter plant to activated sludge with specific processes for TN and TP reduction.

Figure 4.5–Alternative 5 Schematic



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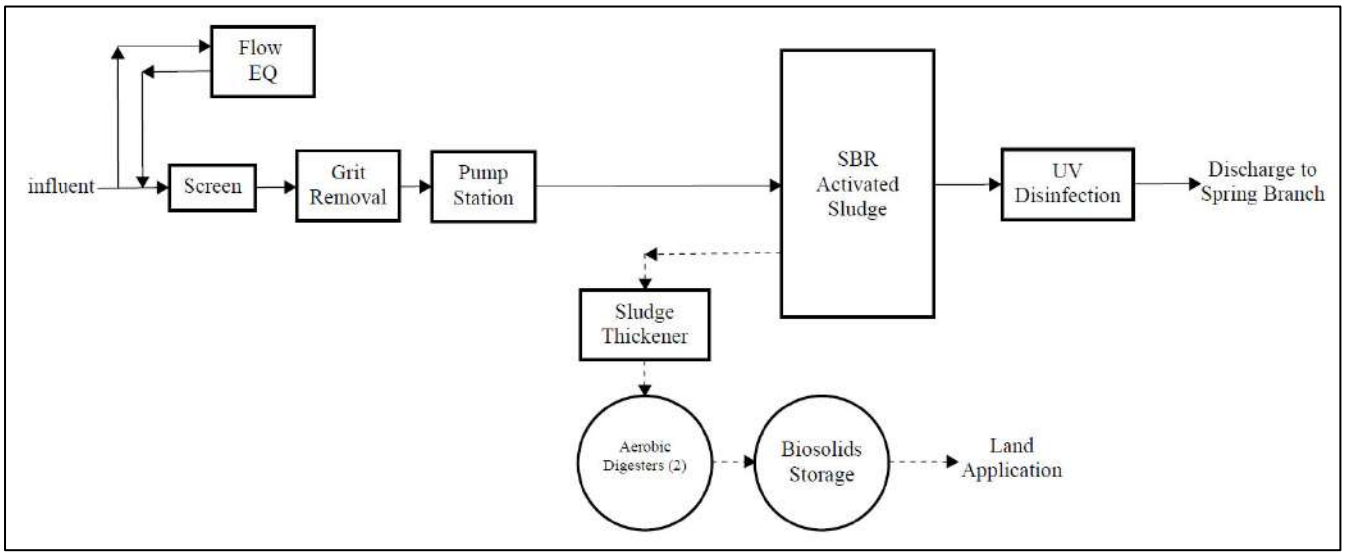
4.07 ALTERNATIVE 6–CONVERT TO SBR ACTIVATED SLUDGE AND AEROBIC DIGESTION

Under this option, similar to the previous alternatives, many of the unit processes of the existing WWTP would be removed from service and potentially demolished, including the roughing filter, roughing filter pumping station, intermediate clarifier(s), trickling filters, trickling filter pumping station, and final clarifiers. In addition, the existing primary clarifier and clariflotator would be eliminated and the existing anaerobic digesters would be converted to aerobic digesters. The secondary treatment process would be the same as Alternative 5, with a new SBR, only larger to provide for additional treatment capacity because the primary clarifiers would be eliminated. The SBR system would be designed to treat for removal of nitrogen and phosphorus and comply with the 10-mg/L TN and 1.0-mg/L TP effluent goals indicated in the Iowa NRS. This alternative includes expanding flow EQ, upgrading preliminary treatment to include screening and improved grit removal, replacing raw wastewater pumps, constructing a new SBR system, and continued use of the existing UV disinfection system. Flow through the primary and secondary treatment processes would be limited to approximately 4.0 MGD. Additional wastewater would be diverted to a flow EQ basin. Improvements to the solids handling facilities include new sludge thickening, converting the existing anaerobic digesters to aerobic digesters, and providing additional biosolids storage. A schematic is shown in Figure 4.6.

As with Alternative 5, this alternative is considered lesser degrading by converting from a trickling filter plant to an SBR to reduce TN and TP. However, as the least cost alternative that will meet project objectives it is considered the Base Pollution Control Alternative (BCPA) from which all other alternatives are compared.

Figure 4.6–Alternative 6 Schematic



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4.08 ALTERNATIVE 7–LAND APPLICATION

This alternative is intended to be a Non-Degrading Alternative (NDA). To attain this classification, the current effluent flows continue to be discharged to Outfall 001, but the "increase" in flows over the design period are land applied. Chapter 21 of the Iowa Wastewater Facilities Design Standards addresses land application of WWTP effluent. At a minimum, the wastewater must be pretreated to a level attainable in a primary lagoon. The existing WWTP is near the end of its useful life, so the WWTP will still require a major upgrade to meet anticipated limits with the portion of the flow that will continue to be directly discharged to the receiving stream. Flow directed to land application will also be treated by the upgraded WWTP to meet the Chapter 21 requirements.

For the purposes of this study, it is assumed that all improvements required under Alternative 6 will be implemented and the excess flow over current discharges will be directed toward the land application facilities. Based on a current AWW of 2.66 MGD and a projected AWW of 3.20 MGD, the net flow rate of 0.54 MGD must be applied to the land to meet the NDA standard.

After treatment through the plant the excess effluent would be diverted from Outfall 001 and transmitted to a new holding lagoon. According to Chapter 21, Figure 3, the holding pond must be sized to accommodate 230 days of flow. Based on a design AWW of 0.54 MGD, a storage volume of 124 million gallons (MG) is required, plus additional volume to accommodate precipitation falling on the lagoon surface and application site. Assuming a usable depth of 12 feet in the lagoon and additional area for dikes and access, the total area required would be approximately 40 acres.

The pretreated wastewater is distributed over the land by sprinklers due to the nearly flat topography. The flow is eliminated by both percolation and evapotranspiration from the grass growing over the site. Any flow not eliminated as it passes over the field is collected in ditches at the lower end of the application site. In accordance with the regulations, it may be recirculated back to the holding lagoon or discharged to a stream with the appropriate NPDES permit. However, to consider this alternative as an NDA, none of the flow can be allowed to reach the receiving stream and adequate ground must be dedicated to land application to accommodate all the flow.

Given the flow is restricted to treated domestic wastewater, restrictions in application rates due to nutrients or other contaminants in the waste stream are not anticipated. Percolation testing will be required, but it is anticipated that the soils and vegetation in the application area will not be a controlling factor. Consequently, the application rate used herein is based on the overland flow rates identified in Chapter 21 (i.e., a maximum hydraulic loading rate of 3 inches per week).

To use transpiration from the plants, it is assumed that application will only take place during the growing season; reported to be 153 days in this area (approximately 22 weeks). At the maximum application rate of 3 inches per week, it may be possible to apply up to 66 inches per year. To accommodate 124 MG, approximately 69 acres are needed, plus buffer areas, collection ditches, and additional area for precipitation over the site. Assuming an additional 25 percent of land area is needed for these other purposes, the land application area required is approximately 86 acres.

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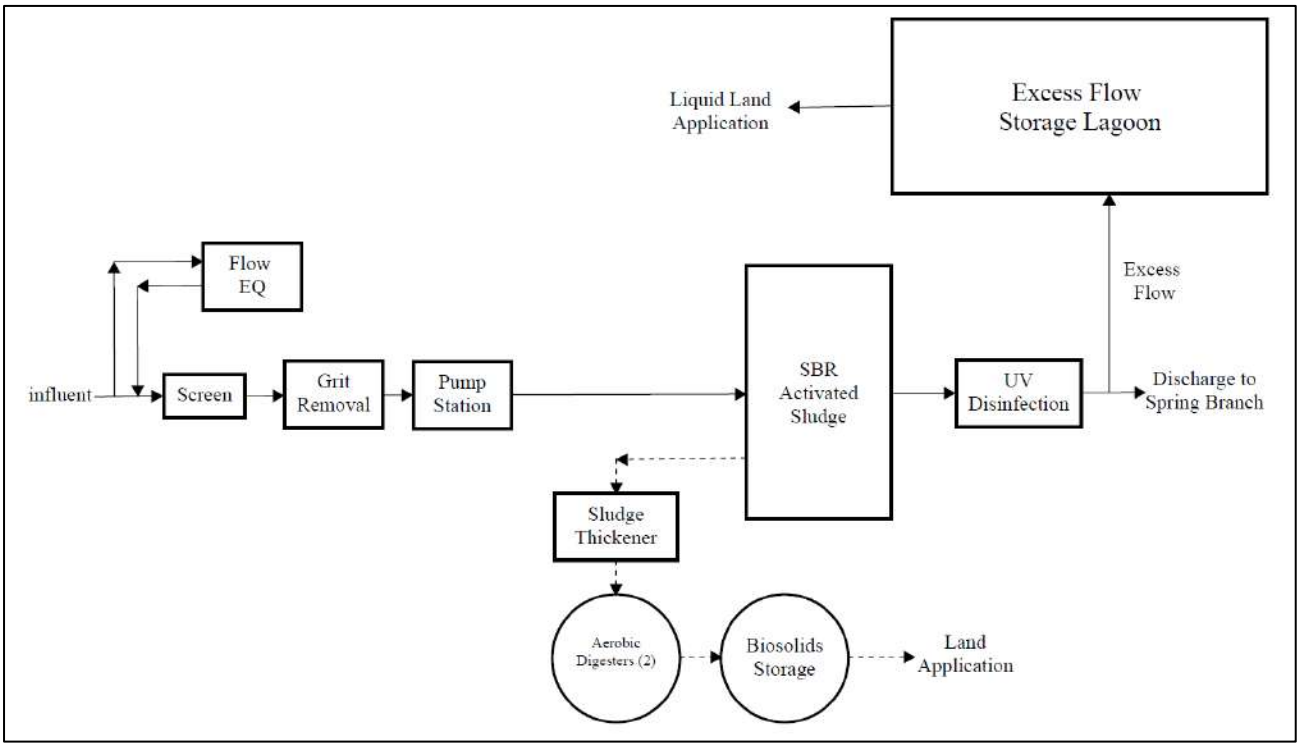
Combined with the needed area for the holding lagoon the total land requirement would be at least 126 acres. For the purposes of this study, it is assumed that the areas east and south of the facility can be purchased and are adequate to locate the lagoon and serve as the land application area. A schematic is shown in Figure 4.7.

Figure 4.7–Alternative 7 Schematic



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SECTION 5–EVALUATION OF ALTERNATIVES

5.01 CAPITAL COSTS

A summary of the opinion of probable cost (OPC) for each alternative is shown in Table 5.1. These cost opinions are intended to be used as a basic guideline for budgetary planning. OPCs were prepared from project information from other Strand projects, budget quotations received from equipment manufacturers, data provided by cost estimating guides (e.g., RS Means), and other project cost information available to Strand. Capital costs are considered in 2023 dollars.

As can be seen in Table 5.1, Alternative 6–SBR with Aerobic Digestion has the lowest capital cost. Alternative 5 is within approximately 1 percent and could be considered equivalent in cost. Alternative 2–AGS is approximately 4 percent higher, and Alternative 4–Oxidation Ditch is approximately 11 percent higher.

Table 5.1–OPC Summary

Alternative	
1–Expand Existing Treatment Process and Add Nutrient Removal	$36,241,000
2–Convert to an AGS System	$29,023,000
3–Convert to an Aero-Mod® Activated Sludge System	$33,617,000
4–Convert to an Oxidation Ditch Activated Sludge System	$31,068,000
5–Convert to an SBR Activated Sludge System	$28,245,000
6–Convert to an SBR Activated Sludge System and Aerobic Digestion	$27,943,000
7–Implement Alternative 6 and Land Apply Effluent in Excess of Current Flows	$39,481,000

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5.02 NET PRESENT COST (NPC) ANALYSIS

The OPC for each alternative reflects the initial cost and does not include operation and maintenance (O&M) costs associated with the facility over the 20-year design period. Other costs (such as electricity, labor, and equipment replacement) can largely impact the true long-term cost of a given alternative.

The NPC evaluation method was used to compare the cost effectiveness of the alternatives presented over the 20-year planning period. This evaluation considers the initial, or capital costs, as well as the O&M costs. In addition, salvage values were also estimated and included in the evaluation for improvements that are expected to have a life longer than the design period of 20 years. With the NPC method, all project costs are converted into their equivalent value at present time. Alternatives with a higher NPC would be considered less economically favorable than those with a lower NPC.

Table 5.2–NPC Summary

Alternative	
1–Expand Existing Treatment Process and Add Nutrient Removal	$43,762,000
2–Convert to an AGS System	$35,682,000
3–Convert to an Aero-Mod® Activated Sludge System	$38,224,000
4–Convert to an Oxidation Ditch Activated Sludge System	$36,405,000
5–Convert to an SBR Activated Sludge System	$33,913,000
6–Convert to an SBR Activated Sludge System and Aerobic Digestion	$33,869,000
7–Implement Alternative 6 and Land Apply Effluent in Excess of Current Flows	$41,414,000

As can be seen in Table 5.2, Alternative 6 has the lowest NPC. Alternative 5 is the next lowest with an NPC approximately 0.1 percent higher, which can be considered equivalent to Alterative 6. The NPC of Alterative 2 is approximately 5 percent higher and Alternative 4 is approximately 7 percent more than Alternative 6.

5.03 ECONOMIC EFFICIENCY AND COST VERSUS ENVIRONMENTAL BENEFIT

The economic efficiency of the alternatives was evaluated based on:

1. Iowa's nonbinding criterion of 115 percent.
2. Consideration of incremental cost increases associated with each alternative versus the anticipated environmental benefit.

As a first step in attempting to gauge the environmental benefit, the estimated differences in effluent quality and loadings at average daily conditions for the existing treatment system and the practicable alternatives are presented in Tables 5.3 through 5.5.

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Table 5.3–Anticipated POC Effluent Quality at Average Daily Conditions, Concentrations

Alternative No.	$CBOD_5$ (mg/L)	TSS (mg/L)	Ammonia-Nitrogen* (mg/L)	*E. Coli* (#/100 mL)	Chloride (mg/L)	Sulfate (mg/L)	TN** (mg/L)	TP** (mg/L)
Existing	25	30	2.2	630	394	1,516	16.2	3.9
1	25	30	2.2	630	394	1,516	10	1
2	25	30	2.2	630	394	1,516	10	1
3	25	30	2.2	630	394	1,516	10	1
4	25	30	2.2	630	394	1,516	10	1
5	25	30	2.2	630	394	1,516	10	1
6	25	30	2.2	630	394	1,516	10	1
7	25	30	2.2	630	394	1,516	10	1

*Ammonia-Nitrogen is the average of the permit 30-day average effluent concentrations for 12 months.
**TN and TP concentrations for existing facility determined based on historical effluent data collected from 2016 to April 2020.

Table 5.4–Anticipated POC Effluent Quality at Average Daily Conditions (1.42 MGD), Loadings

Alternative No.	$CBOD_5$ (lb/day)	TSS (lb/day)	Ammonia-Nitrogen (lb/day)	*E. Coli* (# org.)	Chloride (lb/day)	Sulfate (lb/day)	TN (lb/day)	TP (lb/day)
Existing	396	475	34.9	45,311,000,000	6,243	24,023	257	61.8
1	396	475	34.9	45,311,000,000	6,243	24,023	158	15.8
2	396	475	34.9	45,311,000,000	6,243	24,023	158	15.8
3	396	475	34.9	45,311,000,000	6,243	24,023	158	15.8
4	396	475	34.9	45,311,000,000	6,243	24,023	158	15.8
5	396	475	34.9	45,311,000,000	6,243	24,023	158	15.8
6	396	475	34.9	45,311,000,000	6,243	24,023	158	15.8
7	286	343	25.1	32,672,000,000	4,502	17,322	114	11.4

#org.=number of organisms

Table 5.5–Incremental Loading Removals as Compared to the BPCA (Alternative 3)

Alternative No.	$CBOD_5$ (lb/day)	TSS (lb/day)	Ammonia-Nitrogen (lb/day)	*E. Coli* (# org.)	Chloride (lb/day)	Sulfate (lb/day)	TN (lb/day)	TP (lb/day)
Existing	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	111	133	10	12,39,000,000	1,742	6,701	44	4.4

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A discussion of these results is summarized in the following:

- The existing condition is not practicable because of the poor condition of the existing facilities, including several structures and equipment at the end of their useful life, and the existing facility does not have adequate capacity to handle 2045 design flows and loads.
- Alternative 1–Expand Existing Treatment Process and Add Nutrient Removal would produce nominally the same effluent quality as Alternative 6.
- Alternative 2–AGS System would produce nominally the same effluent quality as Alternative 6.
- Alternative 3–Aero-Mod Activated Sludge System would produce nominally the same effluent quality as Alternative 6.
- Alternative 4–Oxidation Ditch Activated Sludge System would produce nominally the same effluent quality as Alternative 6.
- Alternative 5–SBR Activated Sludge System would produce nominally the same effluent quality as Alternative 6.
- Alternative 6–SBR Activated Sludge System and Aerobic Digestion, is the BPCA and is the reference alternative. As such, all incremental removals for this alternative are zero.
- Alternative 7–Alternative 6 plus Land Application of Effluent in Excess of Current Flows is an NDA that would remove additional effluent POC loadings from the existing discharge point by land applying additional water and solids.

The second step in attempting to determine the environmental benefit associated with each alternative for various POC reductions is to determine what effect, if any, each of the reductions will have on the receiving stream network. Gauging both near- and far-field effects of each incremental POC loading is a difficult, if not impossible, task. For the purposes of this analysis, two simplifying assumptions will be made:

1. Incremental loads for POCs with effluent limits as stringent or more stringent than that required by WQSs numeric criteria ($CBOD_5$, TSS, ammonia, *E. coli*, chloride, sulfate, and priority pollutants) will not have a discernable effect on the environment provided that effluent limitations are met.

2. Incremental loads for POCs that do not have effluent limits associated with WQSs numeric criteria but are generally known to have environmental impacts (nutrients) are presumed to have some effect at the incremental loading levels associated with the alternatives.

The third step in determining environmental benefit is valuation of the effects of POC loadings for comparison to incremental alternative costs. Under the previous simplifying assumptions, this analysis will only attempt to value the effects of incremental nutrient loads. To accomplish this, two separate sources of information will be used, one of which quantifies nationwide nutrient loads in excess of assimilative capacities and another that places values associated with those loadings on damages attributable to freshwater eutrophication.

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USEPA reports estimated incremental nutrient loads for each state in the United States (US) for 2002 via the United States Geological Survey SPARROW model at https://www.epa.gov/nutrient-policy-data/estimated-total-nitrogen-and-total-phosphorus-loads-and-yields-generated-within. Although for some states the modeling was incomplete, the following incremental nitrogen and phosphorus loadings can be summed to arrive at an approximate estimate of nationwide incremental nutrient loads:

- TN = 8.6 billion pounds per year
- TP = 750 million pounds per year

In Eutrophication of U.S. Freshwaters: Analysis of Potential Economic Damages, Dodds et al., estimates potential value losses of $2.2 billion annually in recreational water usage, waterfront real estate, spending on recovery of threatened and endangered species, and drinking water associated with excess nutrient loading in the US.

As another simplifying assumption, this analysis will assign equal effects to both nitrogen and phosphorus loads (i.e., one-half of the economic damages are attributable to nitrogen and the other one-half are attributable to phosphorus). Using this assumption in addition to the USEPA load and damage estimates, the following are estimated unit valuations of nutrients in terms of negative environmental effects on fresh water:

$$\text{TN Valuation} = \frac{\$1.1 \text{ billion per year}}{8.6 \text{ billion pounds nitrogen per year}} = \$0.13 \text{ per pound of nitrogen}$$

$$\text{TP Valuation} = \frac{\$1.1 \text{ billion per year}}{750 \text{ billion pounds phosphorus per year}} = \$1.47 \text{ per pound of phosphorus}$$

To provide a conservative comparison of the alternatives, the cost evaluation is completed on the difference in nutrient loading between alternatives, as summarized in Table 5.6:

Table 5.6–Present Worth Cost Comparison of Alternatives

Alternative		Total Reduction of Daily Load (lb/day)	Total Annual Load (lb/yr)	Annual Benefit	Present Worth Benefit
Alternative 7 vs. Alternative 6 (BPCA)	TN	44	16,134	$2,097	$31,937
	TP	4.4	1,613	$6,354	$36,114
				Total	**$68,051**

lb/yr=pounds per year

As shown in Table 5.6, the total present worth benefit of implementing the NDA is approximately $68,051. A benefit-to-cost ratio greater than 1.0 would be required to demonstrate that the incremental cost of an alternative is justified given the incremental environmental benefit. To achieve a benefit-to-cost ratio greater than 1.0, the difference in NPC

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between the alternatives would need to be less than $68,051. As shown in Table 5.2, the NPC for Alternative 7 is $7,545,000 greater than the present worth cost for Alternative 6, for a benefit-to-cost ratio of 0.01.

It should be noted that this methodology for estimating environmental benefits is by no means exact. For example, the source of nationwide costs does not include costs attributable to coastal hypoxia effects. However, given the enormous difference in costs between the alternatives in relation to the calculated benefit, it is not likely that accounting for coastal hypoxia issues would impact the findings of this evaluation.

Table 5.7 summarizes the evaluation of alternatives with respect to classification as non-degrading, less-degrading, or the BPCA as well as the practicability, economic efficiency, and affordability of each alternative. According to the US Census estimates from the 2022 American Community Survey 5-Year Estimates, the median household income (MHI) for the City is $60,052 per year. The percentage of MHI shown in Table 5.7 for each alternative was calculated based on the present worth cost of each alternative less salvage value, an interest rate of 2.75 percent over 20 years and a total of 1,491 housing units. It was also assumed that industrial contributors would continue to pay approximately 35 percent of the cost, and households would pay 65 percent.

Table 5.7–Alternative Classification and Evaluation

Alternative No.	BPCA NDA or LDA?	Practicable	Economically Efficient	Percent of BPCA	Affordable	Percent of MHI	Reasonable
1A	LDA	Yes	Yes	130	No	2.26	No
2A	LDA	Yes	Yes	104	Yes	1.85	Yes
3A	LDA	Yes	Yes	120	No	2.08	No
4A	LDA	Yes	Yes	111	Yes	1.99	Yes
5A	LDA	Yes	Yes	101	Yes	1.83	Yes
6A	BPCA	Yes	Yes	100	Yes	1.83	Yes
7A	NDA	Yes	No	141	No	2.43	No

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SECTION 6–RECOMMENDATIONS AND IMPLEMENTATION

6.01 DEGRADATION COMPARISON

Table 6.1 provides a comparison of the potential degradation of the alternatives deemed "reasonable" on a pollutant-by-pollutant basis.

Table 6.1–Reasonable Alternatives Degradation Comparison

POC	Potential Degradation: Alternative					Comments
	2	3	4	5	6	
$CBOD_5$	Yes	Yes	Yes	Yes	Yes	Removal efficiencies are expected to increase for these alternatives compared to the existing plant due to the age of the plant and activated sludge technologies will typically produce a higher quality effluent than trickling filters; however, due to the increase in design loading, future mass loading to the stream may be higher than the existing mass loading.
TSS	Yes	Yes	Yes	Yes	Yes	Anticipated removal efficiencies are expected to be similar for these alternatives compared to the existing plant. Because of the increase in design loading, future mass loading to the stream may be higher than the existing mass loading.
Ammonia-Nitrogen	Yes	Yes	Yes	Yes	Yes	Removal efficiencies are expected to increase significantly for these alternatives compared to the existing plant due to the age of the plant. Activated sludge technologies will typically produce a higher quality effluent than trickling filters. However, due to the increase in design loading, future mass loading to the stream may be higher than the existing mass loading.
E. coli	Yes	Yes	Yes	Yes	Yes	The existing UV disinfection has capacity to accommodate the increase flows and loads. The bacteria discharged to the receiving stream will remain similar to existing levels.
Chloride	Yes	Yes	Yes	Yes	Yes	Neither the existing treatment system nor the alternative treatment systems are designed to remove chloride or sulfate. The mass of these pollutants discharged to the stream may increase.
Sulfate	Yes	Yes	Yes	Yes	Yes	See previous.
TN	No	No	No	No	No	The proposed alternatives incorporate BNR capability to meet the Iowa NRS goals and reduce the TN discharge to the stream.
TP	No	No	No	No	No	The proposed alternatives incorporate BNR and/or chemical nutrient removal capability to meet the Iowa NRS goals and reduce the TP discharge to the stream
Priority Pollutants	Yes	Yes	Yes	Yes	Yes	The new technologies do not have aluminum nor copper removal processes. The mass of these pollutants discharged to the stream may increase.

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6.02 RECOMMENDATION

Alternative 6–SBR with Aerobic Digestion has the lowest capital cost, as well as the lowest life cycle cost. Based on anticipated costs and future requirements, Alternative 6–SBR with Aerobic Digestion is recommended for implementation. However, although this is the most cost-effective alternative, it comes with a significant cost. The City should explore all available financing and grant opportunities to help make the project more affordable.

6.03 JUSTIFICATION OF DEGRADATION

All five reasonable alternatives can be expected to discharge similar effluent quality and meet all secondary-based limits and WQBELs. The preferred alternative will increase the debt burden on the community, but at a slightly lower level than the other alternatives. The preferred alternative is anticipated to decrease stream pollutant loadings for ammonia, TN, TP, and possibly $CBOD_5$ due to the efficiencies provided by SBR technology and because the project is replacing equipment and structures that are near the end of their useful life.

The mass loads for the micro constituents of aluminum and copper, as with chlorides and sulfates, can be expected to increase in proportion to the population growth. At a projected growth rate of approximately 2 percent per decade, this increase will be minimal. Conversely, the cost of removing these constituents would be cost-prohibited.

As discussed previously, there may be minor degradation for some POCs because of population growth. However, the project is essential in order to replace equipment that will likely fail within the project period if left in operation. Further, the existing WWTP cannot meet the goals of the Iowa NRS. It is necessary to convert the WWTP to technologies that are capable of reducing TN to 10 mg/L and TP to 1 mg/L.

6.04 PROJECT SOCIAL AND ECONOMIC IMPORTANCE

6.04.1 Affected Community

The affected community is the City. The project is at a municipally owned public treatment works. The entire community will benefit from the project and will ultimately bear the costs through increased user fees.

6.04.2 Community Social and Economic Conditions

The US Census Bureau Web site has data available for the City, as well as Iowa. The selected data provided in Table 6.2 is extracted from the 2015 to 2020 American Community Survey 5-Year Estimates conducted by the Bureau.

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Table 6.2–City Demographics

Factor	City	Iowa State	Notes
Total Adult Population	2,438	2,504,540	Population ≥ 16 years
Total Labor Force	1,580	1,611,524	Population ≥ 16 years
Rate of Employment	67.5%	67.1%	Population ≥ 16 years
Rate of Unemployment	4.0%	3.9%	Population ≥ 16 years
Not in Labor Force	35.2%	32.9%	Population ≥ 16 years
Median Household Income	$60,052	$70,571	2022 Income
Poverty Level	8.0%	26.6%	Families below poverty level in 2019
Population Trends	-7.7%	3.8%	2000 to 2019
Workforce in Manufacturing	27.0%	14.7%	Percent of total persons employed
Workforce in Construction	7.5%	6.5%	Percent of total persons employed

Source: US Census Bureau, 2015 to 2022 American Community Survey 5-Year Estimates

The agricultural trend in Iowa is toward larger farms, greater reliance on equipment, and fewer agricultural employment opportunities. This situation creates challenges for rural communities as they struggle to keep their villages vibrant. The tendency is for families to move to the larger towns and cities where there are more employment opportunities. While the City did show a slight decrease in population from 2010 to 2020, the community anticipates a reversal of this trend because of regional industrial growth and other economic activities. While modest, a growth rate of 2 percent per decade is anticipated over the design period.

In the short term, the project will create construction jobs and bring workers into the area, which will result in some economic stimulation. In the long term, the City can only remain viable if it continues to provide essential services, such as wastewater collection and treatment. This project is essential to maintain the WWTP's ability to meet current and anticipated discharge limits and provide a safe environment.

DRAFT FINAL-(02.22.24)

SECTION 7–PUBLIC COMMENT PERIOD

A 30-day Public Comment Period commenced _____ with the publication of the Public Notice in the New Hampton Tribune and transmission of the Public Notice to the agencies and affected parties identified in Section 4.1 of the Iowa Antidegradation Implementation Procedures.

Responses to the comments received may be found in Appendix C. *To be completed after public comment period.*

APPENDIX A
NPDES PERMIT

DRAFT FINAL-(02.22.24)

AMENDMENT TO NPDES PERMIT

Iowa NPDES Permit Number:	1970001	Date of Permit Issuance:	June 1, 2019
EPA Number:	IA0028525	Date of Permit Expiration:	May 31, 2024
		Date of this Amendment:	November 1, 2020

Name and Mailing Address of Applicant:
CITY OF NEW HAMPTON
112 EAST SPRING ST
NEW HAMPTON, IA 50659

Identity and Location of Facility:
NEW HAMPTON CITY OF STP
800 SOUTH LOCUST AVENUE
NEW HAMPTON, IA 50659

Section 18, T95N, R12W
Chickasaw County

Pursuant to the authority of Iowa Code Section 455B.174, and of Rule 567-64.3, Iowa Administrative Code, the Director of the Iowa Department of Natural Resources has issued the above referenced permit. Pursuant to the same authority, the Director hereby amends said permit as set forth below:

The permit is being amended to remove the remaining requirements in the ammonia-nitrogen compliance schedule and make the new ammonia-nitrogen limits effective. Please remove pages 5, 6 and 39 of your existing permit and replace them with the enclosed pages 5, 6 and 39. Retain the standard conditions pages at the end.

For the Department of Natural Resources:

By Ben Hucka Digitally signed by Ben Hucka Date: 2020.10.20 13:12:18 -05'00'

Ben Hucka
NPDES Section
ENVIRONMENTAL SERVICES DIVISION

DRAFT FINAL-(02.22.24)

AMENDMENT TO NPDES PERMIT

Iowa NPDES Permit Number:	1970001	Date of Permit Issuance:	June 1, 2019
EPA Number:	IA0028525	Date of Permit Expiration:	May 31, 2024
		Date of this Amendment:	May 1, 2020

Name and Mailing Address of Applicant:
CITY OF NEW HAMPTON
112 EAST SPRING ST
NEW HAMPTON, IA 50659

Identity and Location of Facility:
NEW HAMPTON CITY OF STP
800 SOUTH LOCUST AVENUE
NEW HAMPTON, IA 50659

Section 18, T95N, R12W
Chickasaw County

Pursuant to the authority of Iowa Code Section 455B.174, and of Rule 567-64.3, Iowa Administrative Code, the Director of the Iowa Department of Natural Resources has issued the above referenced permit. Pursuant to the same authority, the Director hereby amends said permit as set forth below:

The permit is being amended to change the limits for TriMark Corporation and Bay Valley Foods. Please remove pages 15 – 37 of your existing permit and replace them with the enclosed pages 15 – 40. Retain the standard conditions pages at the end.

For the Department of Natural Resources:

By Julie M Faas
Julie Faas
NPDES Section
ENVIRONMENTAL SERVICES DIVISION

DRAFT FINAL-(02.22.24)

IOWA DEPARTMENT OF NATURAL RESOURCES

National Pollutant Discharge Elimination System (NPDES) Permit

OWNER NAME & ADDRESS

CITY OF NEW HAMPTON
112 EAST SPRING ST.
NEW HAMPTON, IA 50659-0000

FACILITY NAME & ADDRESS

NEW HAMPTON CITY OF STP
800 SOUTH LOCUST AVENUE
NEW HAMPTON, IA 50659-

Section 18, T95N, R12W
Chickasaw County

IOWA NPDES PERMIT NUMBER: 1970001
DATE OF ISSUANCE: 06/01/2019
DATE OF EXPIRATION: 05/31/2024

YOU ARE REQUIRED TO FILE FOR RENEWAL OF THIS PERMIT BY: 12/03/2023
EPA NUMBER: IA0028525

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 this department within 30 days of your receipt of this permit.

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 _____

Ann Seda
NPDES Section
ENVIRONMENTAL SERVICES DIVISION

DRAFT FINAL-(02.22.24)

Outfall No.: 001 DISCHARGE FROM A TRICKLING FILTER WASTEWATER TREATMENT FACILITY.

Receiving Stream: SPRING BRANCH

Route of Flow: SPRING BRANCH TO LITTLE WASPIPINICON RIVER

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 BYPASS FROM NORTH AND SOUTH FLOW EQUALIZATION BASINS.

Receiving Stream: SPRING BRANCH

Route of Flow: SPRING BRANCH TO LITTLE WASPIPINICON RIVER

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.

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

DRAFT FINAL-(02.22.24)

Effluent Limitations:

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

001 DISCHARGE FROM A TRICKLING FILTER WASTEWATER TREATMENT FACILITY.

Outfall: 001 Effective Dates: 06/01/2019 to 05/31/2024			
Parameter	**Season**	**Limit Type**	**Limits**
CBOD5			**85% Removal Required**
	Yearly	7 Day Average	40 MG/L 734 LBS/DAY
	Yearly	30 Day Average	25 MG/L 459 LBS/DAY
TOTAL SUSPENDED SOLIDS			**85% Removal Required**
	Yearly	7 Day Average	45 MG/L 825 LBS/DAY
	Yearly	30 Day Average	30 MG/L 550 LBS/DAY
ALUMINUM, TOTAL (AS AL)			
	Yearly	30 Day Average	0.0873 MG/L 1.6016 LBS/DAY
	Yearly	Daily Maximum	0.7502 MG/L 13.7652 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

DRAFT FINAL-(02.22.24)

Outfall: 001 Effective Dates: 06/01/2019 to 05/31/2024			
Parameter	**Season**	**Limit Type**	**Limits**
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

DRAFT FINAL-(02.22.24)

Outfall: 001 Effective Dates: 06/01/2019 to 10/31/2020			
Parameter	**Season**	**Limit Type**	**Limits**
AMMONIA NITROGEN (N)			
	JAN	30 Day Average	5.2 MG/L 96.1 LBS/DAY
	JAN	Daily Maximum	14.2 MG/L 214.7 LBS/DAY
	FEB	30 Day Average	5.9 MG/L 108.1 LBS/DAY
	FEB	Daily Maximum	14.2 MG/L 242.2 LBS/DAY
	MAR	30 Day Average	4.6 MG/L 84.5 LBS/DAY
	MAR	Daily Maximum	13.1 MG/L 200.0 LBS/DAY
	APR	30 Day Average	2.1 MG/L 38.9 LBS/DAY
	APR	Daily Maximum	9.2 MG/L 139.4 LBS/DAY
	MAY	30 Day Average	1.9 MG/L 34.0 LBS/DAY
	MAY	Daily Maximum	6.4 MG/L 97.2 LBS/DAY
	JUN	30 Day Average	1.4 MG/L 24.9 LBS/DAY
	JUN	Daily Maximum	4.6 MG/L 67.9 LBS/DAY
	JUL	30 Day Average	1.1 MG/L 20.1 LBS/DAY
	JUL	Daily Maximum	3.5 MG/L 51.4 LBS/DAY
	AUG	30 Day Average	1.0 MG/L 18.4 LBS/DAY
	AUG	Daily Maximum	3.4 MG/L 49.5 LBS/DAY
	SEP	30 Day Average	1.5 MG/L 27.5 LBS/DAY
	SEP	Daily Maximum	4.2 MG/L 62.4 LBS/DAY
	OCT	30 Day Average	2.8 MG/L 52.2 LBS/DAY
	OCT	Daily Maximum	5.8 MG/L 86.2 LBS/DAY
	NOV	30 Day Average	3.4 MG/L 63.3 LBS/DAY
	NOV	Daily Maximum	8.4 MG/L 126.6 LBS/DAY
	DEC	30 Day Average	4.0 MG/L 73.5 LBS/DAY
	DEC	Daily Maximum	11.8 MG/L 180.0 LBS/DAY

DRAFT FINAL-(02.22.24)

Outfall: 001 Effective Dates: 11/01/2020 to 05/31/2024			
Parameter	**Season**	**Limit Type**	**Limits**
AMMONIA NITROGEN (N)			
	JAN	30 Day Average	3.6 MG/L 64.3 LBS/DAY
	JAN	Daily Maximum	14.2 MG/L 214.7 LBS/DAY
	FEB	30 Day Average	4.1 MG/L 74.6 LBS/DAY
	FEB	Daily Maximum	14.2 MG/L 242.2 LBS/DAY
	MAR	30 Day Average	3.6 MG/L 64.3 LBS/DAY
	MAR	Daily Maximum	13.1 MG/L 200.0 LBS/DAY
	APR	30 Day Average	1.6 MG/L 28.8 LBS/DAY
	APR	Daily Maximum	9.2 MG/L 139.4 LBS/DAY
	MAY	30 Day Average	1.8 MG/L 32.8 LBS/DAY
	MAY	Daily Maximum	6.4 MG/L 97.2 LBS/DAY
	JUN	30 Day Average	1.4 MG/L 24.7 LBS/DAY
	JUN	Daily Maximum	4.6 MG/L 67.9 LBS/DAY
	JUL	30 Day Average	1.1 MG/L 19.0 LBS/DAY
	JUL	Daily Maximum	3.5 MG/L 51.4 LBS/DAY
	AUG	30 Day Average	1.0 MG/L 18.0 LBS/DAY
	AUG	Daily Maximum	3.4 MG/L 49.5 LBS/DAY
	SEP	30 Day Average	1.1 MG/L 19.9 LBS/DAY
	SEP	Daily Maximum	4.2 MG/L 62.4 LBS/DAY
	OCT	30 Day Average	1.6 MG/L 29.4 LBS/DAY
	OCT	Daily Maximum	5.8 MG/L 86.2 LBS/DAY
	NOV	30 Day Average	2.4 MG/L 43.8 LBS/DAY
	NOV	Daily Maximum	8.4 MG/L 126.6 LBS/DAY
	DEC	30 Day Average	2.6 MG/L 46.7 LBS/DAY
	DEC	Daily Maximum	11.8 MG/L 180.0 LBS/DAY

Outfall: 001 Effective Dates: 03/01/2020 to 05/31/2024			
Parameter	**Season**	**Limit Type**	**Limits**
COPPER, TOTAL (AS CU)			
	Yearly	30 Day Average	0.0171 MG/L 0.3118 LBS/DAY
	Yearly	Daily Maximum	0.0269 MG/L 0.4939 LBS/DAY

DRAFT FINAL-(02.22.24)

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. 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 and 30-day 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) 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.

(e) Any 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.

(f) Chapter 63 of the Iowa Administrative Code contains further explanation of these monitoring requirements.

DRAFT FINAL-(02.22.24)

Outfall	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
The following monitoring requirements shall be in effect from 06/01/2019 to 05/31/2024				
001	PH	4 TIMES PER WEEK	GRAB	RAW WASTE FROM WEST INFLUENT LINE
001	TEMPERATURE	4 TIMES PER WEEK	GRAB	RAW WASTE FROM WEST INFLUENT LINE
001	PH	4 TIMES PER WEEK	GRAB	RAW WASTE FROM EAST INFLUENT LINE
001	TEMPERATURE	4 TIMES PER WEEK	GRAB	RAW WASTE FROM EAST INFLUENT LINE
001	BIOCHEMICAL OXYGEN DEMAND (BOD5)	4 TIMES PER WEEK	CALCULATED	RAW WASTE
001	FLOW	7/WEEK OR DAILY	CALCULATED	RAW WASTE
001	NITROGEN, TOTAL (AS N)	1 TIME PER WEEK	CALCULATED	RAW WASTE
001	NITROGEN, TOTAL KJELDAHL (AS N)	1 EVERY MONTH	CALCULATED	RAW WASTE
001	PHOSPHORUS, TOTAL (AS P)	1 TIME PER WEEK	CALCULATED	RAW WASTE
001	TOTAL SUSPENDED SOLIDS	4 TIMES PER WEEK	CALCULATED	RAW WASTE
001	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	FINAL EFFLUENT
001	CBOD5	4 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT PRIOR TO DISINFECTION
001	TOTAL SUSPENDED SOLIDS	4 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	ALUMINUM, TOTAL (AS AL)	1 TIME PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	AMMONIA NITROGEN (N)	4 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	DISSOLVED OXYGEN	4 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION
001	E. COLI	GEO. MEAN 1/3 MONTHS	GRAB	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	4 TIMES PER WEEK	GRAB	EFFLUENT AFTER DISINFECTION

DRAFT FINAL-(02.22.24)

Outfall	Wastewater Parameter	Sample Frequency	Sample Type	Monitoring Location
The following monitoring requirements shall be in effect from 03/01/2020 to 05/31/2024				
001	COPPER, TOTAL (AS CU)	3 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT AFTER DISINFECTION

DRAFT FINAL-(02.22.24)

Special Monitoring Requirements

Outfall # **Description**

001 **FLOW**

Raw flow shall be calculated as the sum of the 24 hour daily totals from the east parshall flume and the west parshall flume.

BIOCHEMICAL OXYGEN DEMAND (BOD5)

24 hour samples are required at each influent line to determine the mass loadings from each line. The total influent load to the treatment facility shall then be calculated.

TOTAL SUSPENDED SOLIDS

24 hour samples are required at each influent line to determine the mass loadings from each line. The total influent load to the treatment facility shall then be calculated.

NITROGEN, TOTAL KJELDAHL (AS N)

24 hour samples are required at each influent line to determine the mass loadings from each line. The total influent load to the treatment facility shall then be calculated.

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.

24 hour samples are required at each influent line to determine the mass loadings from each line. The total influent load to the treatment facility shall then be calculated.

PHOSPHORUS, TOTAL (AS P)

24 hour samples are required at each influent line to determine the mass loadings from each line. The total influent load to the treatment facility shall then be calculated.

ALUMINUM, TOTAL (AS AL)

EPA approved test methods shall be used to test at or below the limits of this permit. 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 non-compliant with that limit.

COPPER, TOTAL (AS CU)

EPA approved test methods shall be used to test at or below the limits of this permit. 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 non-compliant with that limit.

DRAFT FINAL-(02.22.24)

E. COLI

The limit for E. coli of 630 org/100 ml specified on page 4 of this permit for outfall 001 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 whenever wastewater is being discharged from outfall 001.

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.
If you have exactly five samples, use the geometric mean calculator on the Iowa DNR webpage at: http://www.iowadnr.gov/Environmental-Protection/Water-Quality/NPDES-Wastewater-Permitting/NPDES-Operator-Information/Bacteria-Sampling

DRAFT FINAL-(02.22.24)

Significant Industrial User Discharges:

Significant Industrial User: SPARBOE FOODS CORPORATION

Outfall #	**Outfall Description**
001	EFFLUENT FOLLOWING PRETREATMENT PRIOR TO DISCHARGE TO THE MUNICIPAL COLLECTION SYSTEM.

Significant Industrial User Effluent Limitations

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

SPARBOE FOODS CORPORATION
Outfall: 001 Effective Dates: 06/01/2019 to 05/31/2024

Parameter	Season	Limit Type	Limit Values
FLOW			
	Yearly	30 Day Average	0.5 MGD
	Yearly	DAILY MAXIMUM	1.0 MGD
BIOCHEMICAL OXYGEN DEMAND (BOD5)			
	Yearly	30 Day Average	1800 LBS/DAY
	Yearly	DAILY MAXIMUM	3600 LBS/DAY
TOTAL SUSPENDED SOLIDS			
	Yearly	30 Day Average	850 LBS/DAY
	Yearly	DAILY MAXIMUM	1700 LBS/DAY
NITROGEN, TOTAL KJELDAHL (AS N)			
	Yearly	30 Day Average	150 LBS/DAY
	Yearly	DAILY MAXIMUM	285 LBS/DAY
OIL AND GREASE			
	Yearly	30 Day Average	200 MG/L
	Yearly	DAILY MAXIMUM	400 MG/L
PH			
	Yearly	DAILY MAXIMUM	9.0 STD UNITS
	Yearly	DAILY MINIMUM	5.1 STD UNITS

DRAFT FINAL-(02.22.24)

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. 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 and 30-day 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) 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.

(e) Any 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.

(f) Chapter 63 of the Iowa Administrative Code contains further explanation of these monitoring requirements.

DRAFT FINAL-(02.22.24)

SPARBOE FOODS CORPORATION				
Outfall	**Wastewater Parameter**	**Sample Frequency**	**Sample Type**	**Monitoring Location**
001	BIOCHEMICAL OXYGEN DEMAND (BOD5)	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	EFFLUENT FROM PRETREATMENT PROCESS
001	NITROGEN, TOTAL KJELDAHL (AS N)	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	OIL AND GREASE	2 TIMES PER WEEK	GRAB	EFFLUENT FROM PRETREATMENT PROCESS
001	PH	2 TIMES PER WEEK	GRAB	EFFLUENT FROM PRETREATMENT PROCESS
001	TOTAL SUSPENDED SOLIDS	1 TIME PER WEEK	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS

DRAFT FINAL-(02.22.24)

Significant Industrial User Discharges:

Significant Industrial User: TRI MARK CORPORATION, DIVISION OF SEALED POWER

Outfall #	**Outfall Description**
001	EFFLUENT FOLLOWING PRETREATMENT PRIOR TO DISCHARGE TO THE MUNICIPAL COLLECTION SYSTEM.

Significant Industrial User Effluent Limitations

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

TRI MARK CORPORATION, DIVISION OF SEALED POWER ***Outfall: 001 Effective Dates: 05/01/2020 to 05/31/2024***			
Parameter	**Season**	**Limit Type**	**Limit Values**
FLOW			
	Yearly	30 Day Average	0.06 MGD
	Yearly	DAILY MAXIMUM	0.10 MGD
PH			
	Yearly	DAILY MAXIMUM	9.5 STD UNITS
	Yearly	DAILY MINIMUM	6.0 STD UNITS
CADMIUM, TOTAL (AS CD)			
	Yearly	30 Day Average	0.012 MG/L 0.0060 LBS/DAY
	Yearly	DAILY MAXIMUM	0.022 MG/L 0.0110 LBS/DAY
CHROMIUM, TOTAL (AS CR)			
	Yearly	30 Day Average	0.222 MG/L 0.1110 LBS/DAY
	Yearly	DAILY MAXIMUM	0.400 MG/L 0.2000 LBS/DAY
COPPER, TOTAL (AS CU)			
	Yearly	30 Day Average	0.196 MG/L 0.0980 LBS/DAY
	Yearly	DAILY MAXIMUM	0.352 MG/L 0.1760 LBS/DAY
CYANIDE, AMENABLE			
	Yearly	30 Day Average	0.034 MG/L 0.0170 LBS/DAY
	Yearly	DAILY MAXIMUM	0.062 MG/L 0.0310 LBS/DAY

DRAFT FINAL-(02.22.24)

TRI MARK CORPORATION, DIVISION OF SEALED POWER			
Outfall: 001 Effective Dates: 05/01/2020 to 05/31/2024			
Parameter	**Season**	**Limit Type**	**Limit Values**
LEAD, TOTAL (AS PB)			
	Yearly	30 Day Average	0.162 MG/L 0.0810 LBS/DAY
	Yearly	DAILY MAXIMUM	0.290 MG/L 0.1450 LBS/DAY
NICKEL, TOTAL (AS NI)			
	Yearly	30 Day Average	0.148 MG/L 0.0740 LBS/DAY
	Yearly	DAILY MAXIMUM	0.2665 MG/L 0.1330 LBS/DAY
SILVER, TOTAL (AS AG)			
	Yearly	30 Day Average	0.164 MG/L 0.0820 LBS/DAY
	Yearly	DAILY MAXIMUM	0.294 MG/L 0.1470 LBS/DAY
TOTAL TOXIC ORGANICS			
	Yearly	DAILY MAXIMUM	2.13 MG/L
ZINC, TOTAL (AS ZN)			
	Yearly	30 Day Average	0.649 MG/L 0.3250 LBS/DAY
	Yearly	DAILY MAXIMUM	1.169 MG/L 0.5850 LBS/DAY

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TRI MARK CORPORATION, DIVISION OF SEALED POWER
Outfall: 001 Effective Dates: 06/01/2019 to 04/30/2020

Parameter	Season	Limit Type	Limit Values
FLOW			
	Yearly	30 Day Average	0.05 MGD
	Yearly	DAILY MAXIMUM	0.09 MGD
PH			
	Yearly	DAILY MAXIMUM	9.5 STD UNITS
	Yearly	DAILY MINIMUM	6.0 STD UNITS
CADMIUM TOTAL (AS CD)			
	Yearly	30 Day Average	0.015 MG/L 0.0060 LBS/DAY
	Yearly	DAILY MAXIMUM	0.026 MG/L 0.0110 LBS/DAY
CHROMIUM, TOTAL (AS CR)			
	Yearly	30 Day Average	0.267 MG/L 0.111 LBS/DAY
	Yearly	DAILY MAXIMUM	0.480 MG/L 0.200 LBS/DAY
COPPER, TOTAL (AS CU)			
	Yearly	30 Day Average	0.234 MG/L 0.0980 LBS/DAY
	Yearly	DAILY MAXIMUM	0.421 MG/L 0.1760 LBS/DAY
CYANIDE, AMENABLE			
	Yearly	30 Day Average	0.042 MG/L 0.0170 LBS/DAY
	Yearly	DAILY MAXIMUM	0.075 MG/L 0.0310 LBS/DAY
LEAD, TOTAL (AS PB)			
	Yearly	30 Day Average	0.193 MG/L 0.0810 LBS/DAY
	Yearly	DAILY MAXIMUM	0.348 MG/L 0.1450 LBS/DAY
NICKEL, TOTAL (AS NI)			
	Yearly	30 Day Average	0.177 MG/L 0.0740 LBS/DAY
	Yearly	DAILY MAXIMUM	0.319 MG/L 0.1330 LBS/DAY

DRAFT FINAL-(02.22.24)

TRI MARK CORPORATION, DIVISION OF SEALED POWER
Outfall: 001 Effective Dates: 06/01/2019 to 04/30/2020

Parameter	Season	Limit Type	Limit Values	
SILVER, TOTAL (AS AG)				
	Yearly	30 Day Average	0.196 MG/L	0.0820 LBS/DAY
	Yearly	DAILY MAXIMUM	0.353 MG/L	0.1470 LBS/DAY
TOTAL TOXIC ORGANICS				
	Yearly	DAILY MAXIMUM	2.13 MG/L	
ZINC, TOTAL (AS ZN)				
	Yearly	30 Day Average	0.779 MG/L	0.3250 LBS/DAY
	Yearly	DAILY MAXIMUM	1.402 MG/L	0.5850 LBS/DAY

DRAFT FINAL-(02.22.24)

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 submitted to 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 Iowa Administrative Code contains further explanation of these monitoring requirements.

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TRI MARK CORPORATION, DIVISION OF SEALED POWER				
Outfall	**Wastewater Parameter**	**Sample Frequency**	**Sample Type**	**Monitoring Location**
001	CYANIDE, AMENABLE	2 PER MONTH	GRAB	IMMEDIATELY FOLLOWING CYANIDE TREATMENT
001	CADMIUM, TOTAL (AS CD)	2 PER MONTH	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	CHROMIUM, TOTAL (AS CR)	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	COPPER, TOTAL (AS CU)	2 PER MONTH	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	EFFLUENT FROM PRETREATMENT PROCESS
001	LEAD, TOTAL (AS PB)	2 PER MONTH	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	NICKEL, TOTAL (AS NI)	1 EVERY 3 MONTHS	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	PH	2 TIMES PER WEEK	GRAB	EFFLUENT FROM PRETREATMENT PROCESS
001	SILVER, TOTAL (AS AG)	2 PER MONTH	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	TOTAL TOXIC ORGANICS	1 EVERY MONTH	GRAB	EFFLUENT FROM PRETREATMENT PROCESS
001	ZINC, TOTAL (AS ZN)	1 EVERY 3 MONTHS	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS

DRAFT FINAL-(02.22.24)

TRI MARK CORPORATION, DIVISION OF SEALED POWER
Special Monitoring Requirements

Outfall #	Description
001	TOTAL TOXIC ORGANICS

IN LIEU OF MONITORING FOR TOTAL TOXIC ORGANICS (TTO), YOU MAY MAKE THE FOLLOWING CERTIFICATION STATEMENT ON EACH MONTHLY DISCHARGE REPORT: "BASED ON MY INQUIRY OF THE PERSON OR PERSONS DIRECTLY RESPONSIBLE FOR MANAGING COMPLIANCE WITH THE PERMIT LIMITATION OR (PRETREATMENT STANDARD) FOR TTO. I CERTIFY THAT TO THE BEST ON MY KNOWLEDGE AND BELIEF, NO DUMPING OF CONCENTRATED TOXIC ORGANICS INTO THE WASTEWATER HAS OCCURRED SINCE FILING OF THE LAST DISCHARGE MONITORING REPORT. I FURTHER CERTIFY THAT THIS FACILITY IS IMPLEMENTING THE SOLVENT MANAGEMENT PLAN SUBMITTED TO THE DEPARTMENT OF NATURAL RESOURCES."

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Significant Industrial User Discharges:

Significant Industrial User: BAY VALLEY FOODS, LLC.

Outfall #	**Outfall Description**
001	EFFLUENT FOLLOWING PRETREATMENT PRIOR TO DISCHARGE TO THE MUNICIPAL COLLECTION SYSTEM.

Significant Industrial User Effluent Limitations

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

BAY VALLEY FOODS, LLC. ***Outfall: 001 Effective Dates: 06/01/2019 to 05/31/2024***			
Parameter	**Season**	**Limit Type**	**Limit Values**
FLOW			
	Yearly	30 Day Average	0.03 MGD
	Yearly	DAILY MAXIMUM	0.05 MGD
BIOCHEMICAL OXYGEN DEMAND (BOD5)			
	Yearly	30 Day Average	1000 LBS/DAY
	Yearly	DAILY MAXIMUM	1500 LBS/DAY
TOTAL SUSPENDED SOLIDS			
	Yearly	30 Day Average	200 LBS/DAY
	Yearly	DAILY MAXIMUM	350 LBS/DAY
NITROGEN, TOTAL KJELDAHL (AS N)			
	Yearly	30 Day Average	21 LBS/DAY
	Yearly	DAILY MAXIMUM	27 LBS/DAY
PH			
	Yearly	DAILY MAXIMUM	9.0 STD UNITS
	Yearly	DAILY MINIMUM	5.0 STD UNITS

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BAY VALLEY FOODS, LLC. ***Outfall: 001 Effective Dates: 05/01/2020 to 05/31/2024***			
OIL AND GREASE			
	Yearly	30 Day Average	150 MG/L
	Yearly	DAILY MAXIMUM	350 MG/L
Outfall: 001 Effective Dates: 06/01/2019 to 04/30/2020			
OIL AND GREASE			
	Yearly	30 Day Average	150 LBS/DAY
	Yearly	DAILY MAXIMUM	350 LBS/DAY

DRAFT FINAL-(02.22.24)

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 submitted to 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 Iowa Administrative Code contains further explanation of these monitoring requirements.

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BAY VALLEY FOODS, LLC.				
Outfall	**Wastewater Parameter**	**Sample Frequency**	**Sample Type**	**Monitoring Location**
001	BIOCHEMICAL OXYGEN DEMAND (BOD5)	2 TIMES PER WEEK	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	FLOW	7/WEEK OR DAILY	24 HOUR TOTAL	EFFLUENT FROM PRETREATMENT PROCESS
001	NITROGEN, TOTAL KJELDAHL (AS N)	1 EVERY MONTH	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS
001	OIL AND GREASE	1 EVERY MONTH	GRAB	EFFLUENT FROM PRETREATMENT PROCESS
001	PH	2 TIMES PER WEEK	GRAB	EFFLUENT FROM PRETREATMENT PROCESS
001	TOTAL SUSPENDED SOLIDS	1 TIME PER WEEK	24 HOUR COMPOSITE	EFFLUENT FROM PRETREATMENT PROCESS

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Significant Industrial User Discharges:

Significant Industrial User: ATEK PRECISION CASTING (ATEK METAL TECHNOLOGIES)

Outfall #	Outfall Description
001	DISCHARGE FROM RINSE TANK jhk
002	DISCHARGE FROM QUENCH TANK

Significant Industrial User Effluent Limitations

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

ATEK PRECISION CASTING (ATEK METAL TECHNOLOGIES)
Outfall: 001 Effective Dates: 06/01/2019 to 05/31/2024

Parameter	Season	Limit Type	Limit Values
FLOW			
	Yearly	30 Day Average	0.0003 MGD
	Yearly	DAILY MAXIMUM	0.0003 MGD
ZINC, TOTAL (AS ZN)			
	Yearly	DAILY MAXIMUM	0.0045288 LBS/DAY
OIL AND GREASE			
	Yearly	DAILY MAXIMUM	0.1057536 LBS/DAY
PHENOLS			
	Yearly	DAILY MAXIMUM	0.0031824 LBS/DAY
COPPER, TOTAL (AS CU)			
	Yearly	DAILY MAXIMUM	0.0044064 LBS/DAY
LEAD, TOTAL (AS PB)			
	Yearly	DAILY MAXIMUM	0.0041616 LBS/DAY
PH			
	Yearly	DAILY MAXIMUM	9.0 STD UNITS
	Yearly	DAILY MINIMUM	6.0 STD UNITS

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ATEK PRECISION CASTING (ATEK METAL TECHNOLOGIES)
Outfall: 002 Effective Dates: 06/01/2019 to 05/31/2024

Parameter	Season	Limit Type	Limit Values
FLOW			
	Yearly	30 Day Average	0.003 MGD
	Yearly	DAILY MAXIMUM	0.003 MGD
ZINC, TOTAL (AS ZN)			
	Yearly	30 Day Average	0.0134 LBS/DAY
	Yearly	DAILY MAXIMUM	0.0355 LBS/DAY
NICKEL, TOTAL (AS NI)			
	Yearly	30 Day Average	0.5 MG/L 0.0125 LBS/DAY
	Yearly	DAILY MAXIMUM	1.0 MG/L 0.0250 LBS/DAY
OIL AND GREASE			
	Yearly	30 Day Average	0.3115 LBS/DAY
	Yearly	DAILY MAXIMUM	0.9344 LBS/DAY
PHENOLS			
	Yearly	30 Day Average	0 LBS/DAY
	Yearly	DAILY MAXIMUM	0 LBS/DAY
COPPER, TOTAL (AS CU)			
	Yearly	30 Day Average	0.0131 LBS/DAY
	Yearly	DAILY MAXIMUM	0.0239 LBS/DAY
LEAD, TOTAL (AS PB)			
	Yearly	30 Day Average	0.0121 LBS/DAY
	Yearly	DAILY MAXIMUM	0.0247 LBS/DAY
PH			
	Yearly	DAILY MAXIMUM	9.0 STD UNITS
	Yearly	DAILY MINIMUM	6.0 STD UNITS

DRAFT FINAL-(02.22.24)

ATEK PRECISION CASTING (ATEK METAL TECHNOLOGIES) - Non-Standard Effluent Limits

Outfall #	Description
001	DISCHARGE IS PROHIBITED IF THE PREDISCHARGE SAMPLES ARE GREATER THAN PERMIT LIMITS. DISCHARGE SHALL OCCUR WITHIN A 12 HOUR PERIOD. DISCHARGE SHALL NOT OCCUR MORE THAN ONCE EVERY THREE MONTHS. DISCHARGE SHALL NOT OCCUR ON THE SAME CALENDAR DAY AS ANY OTHER BATCH DISCHARGE FROM THIS FACILITY.
002	QUENCH TANKS DISCHARGE TWICE PER YEAR. SAMPLES OF DISCHARGE WILL BE TAKEN AND RESULTS REPORTED TO THE CITY.

DRAFT FINAL-(02.22.24)

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 submitted to 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 Iowa Administrative Code contains further explanation of these monitoring requirements.

DRAFT FINAL-(02.22.24)

ATEK PRECISION CASTING (ATEK METAL TECHNOLOGIES)				
Outfall	**Wastewater Parameter**	**Sample Frequency**	**Sample Type**	**Monitoring Location**
001	COPPER, TOTAL (AS CU)	1 EVERY BATCH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	FLOW	1 EVERY BATCH	24 HOUR TOTAL	PRIOR TO DISCHARGE TO CITY SEWER
001	LEAD, TOTAL (AS PB)	1 EVERY BATCH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	OIL AND GREASE	1 EVERY BATCH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	PH	1 EVERY BATCH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	PHENOLS	1 EVERY BATCH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	ZINC, TOTAL (AS ZN)	1 EVERY BATCH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	COPPER, TOTAL (AS CU)	PRIOR TO DISCHARGE	GRAB	PRE-DISCHARGE SAMPLE
001	LEAD, TOTAL (AS PB)	PRIOR TO DISCHARGE	GRAB	PRE-DISCHARGE SAMPLE
001	OIL AND GREASE	PRIOR TO DISCHARGE	GRAB	PRE-DISCHARGE SAMPLE
001	PH	PRIOR TO DISCHARGE	GRAB	PRE-DISCHARGE SAMPLE
001	PHENOLS	PRIOR TO DISCHARGE	GRAB	PRE-DISCHARGE SAMPLE
002	COPPER, TOTAL (AS CU)	1 EVERY BATCH	GRAB	QUENCH TANK
002	FLOW	1 EVERY BATCH	GRAB	QUENCH TANK
002	LEAD, TOTAL (AS PB)	1 EVERY BATCH	GRAB	QUENCH TANK
002	NICKEL, TOTAL (AS NI)	1 EVERY BATCH	GRAB	QUENCH TANK
002	OIL AND GREASE	1 EVERY BATCH	GRAB	QUENCH TANK
002	PH	1 EVERY BATCH	GRAB	QUENCH TANK
002	PHENOLS	1 EVERY BATCH	GRAB	QUENCH TANK
002	ZINC, TOTAL (AS ZN)	1 EVERY BATCH	GRAB	QUENCH TANK

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Significant Industrial User Discharges:

Significant Industrial User: FIVE STAR CO-OP

Outfall #	**Outfall Description**
001	EFFLUENT PRIOR TO DISCHARGE TO THE MUNICIPAL COLLECTION SYSTEM

Significant Industrial User Effluent Limitations

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

FIVE STAR CO-OP ***Outfall: 001 Effective Dates: 06/01/2019 to 05/31/2024***			
Parameter	**Season**	**Limit Type**	**Limit Values**
FLOW			
	Yearly	30 Day Average	0.002 MGD
	Yearly	DAILY MAXIMUM	0.003 MGD
BIOCHEMICAL OXYGEN DEMAND (BOD5)			
	Yearly	30 Day Average	40 LBS/DAY
	Yearly	DAILY MAXIMUM	60 LBS/DAY
TOTAL SUSPENDED SOLIDS			
	Yearly	30 Day Average	5 LBS/DAY
	Yearly	DAILY MAXIMUM	10 LBS/DAY
AMMONIA NITROGEN (N)			
	Yearly	30 Day Average	0.5 LBS/DAY
	Yearly	DAILY MAXIMUM	1.0 LBS/DAY
CHEMICAL OXYGEN DEMAND			
	Yearly	30 Day Average	75 LBS/DAY
	Yearly	DAILY MAXIMUM	100 LBS/DAY
NITROGEN, TOTAL KJELDAHL (AS N)			
	Yearly	30 Day Average	0.5 LBS/DAY
	Yearly	DAILY MAXIMUM	1.0 LBS/DAY

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FIVE STAR CO-OP *Outfall: 001 Effective Dates: 06/01/2019 to 05/31/2024*			
Parameter	**Season**	**Limit Type**	**Limit Values**
BENZENE			
	Yearly	30 Day Average	0.1 MG/L
ETHYLBENZENE			
	Yearly	30 Day Average	0.1 MG/L
TOLUENE			
	Yearly	30 Day Average	0.1 MG/L
XYLENE			
	Yearly	30 Day Average	0.1 MG/L
BETX (BENZENE, ETHLYBENZENE, TOLUENE, AND XYLENES)			
	Yearly	DAILY MAXIMUM	0.75 MG/L
PH			
	Yearly	DAILY MAXIMUM	9.0 STD UNITS
	Yearly	DAILY MINIMUM	6.0 STD UNITS

DRAFT FINAL-(02.22.24)

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 submitted to 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 Iowa Administrative Code contains further explanation of these monitoring requirements.

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FIVE STAR CO-OP				
Outfall	**Wastewater Parameter**	**Sample Frequency**	**Sample Type**	**Monitoring Location**
001	AMMONIA NITROGEN (N)	1 EVERY MONTH	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	BENZENE	1 EVERY MONTH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	BETX (BENZENE, ETHLYBENZENE, TOLUENE, AND XYLENES)	1 EVERY MONTH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	BIOCHEMICAL OXYGEN DEMAND (BOD5)	1 EVERY 3 MONTHS	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	CHEMICAL OXYGEN DEMAND	1 EVERY 3 MONTHS	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	ETHYLBENZENE	1 EVERY MONTH	GRAB	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 EVERY 3 MONTHS	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	PH	1 EVERY MONTH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	TOLUENE	1 EVERY MONTH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER
001	TOTAL SUSPENDED SOLIDS	1 EVERY 3 MONTHS	24 HOUR COMPOSITE	PRIOR TO DISCHARGE TO CITY SEWER
001	XYLENE	1 EVERY MONTH	GRAB	PRIOR TO DISCHARGE TO CITY SEWER

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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 99.90 % effluent and no more than 0.10 % 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.

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Design Capacity

Design: 1

The design capacity for the treatment works is specified in Construction Permit Number 98-322-S, issued Wednesday, July 29, 1998. The treatment plant is designed to treat:

* An average dry weather (ADW) flow of 1.3200 Million Gallons Per Day (MGD).
* An average wet weather (AWW) flow of 2.2000 Million Gallons Per Day (MGD).
* A maximum wet weather (MWW) flow of 3.0000 Million Gallons Per Day (MGD).
* A design 5-day biochemical oxygen demand (BOD5) load of 12300 lbs/day.
* A design Total Kjeldahl Nitrogen (TKN) load of 362.00 lbs/day.

Operator Certification Type/Grade: WW/IV

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).

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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).

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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

DRAFT FINAL-(02.22.24)

Ammonia Nitrogen Compliance Schedule

1. The facility shall make necessary improvements to meet ammonia nitrogen limits according to the following schedule:

- Submit a Work Record Request form to DNR's Wastewater Engineering Section at wastewater-engineering@dnr.iowa.gov by September 1, 2019. The forms and instructions are available on the DNR website at http://www.iowadnr.gov/Environmental-Protection/Water-Quality/Wastewater-Construction/Construction-Permits. Questions on the forms should be directed to either Terry Kirschenman at 515/725-8422 or Emy Liu at 515/725-8421.

- Submit progress report by September 1, 2020. Progress report shall include specific information on the status of the project and future expected timelines for completing construction. Include status on an antidegradation analysis and progress, completion and submittal of the facility plan.

- Achieve compliance with all final ammonia nitrogen limits by November 1, 2020.

Within fourteen (14) days following all dates of compliance, the permittee shall provide written notice of compliance with the scheduled event. All written notices and progress reports shall be sent to the following address:

Iowa Department of Natural Resources
Environmental Services Division
Regional Office # 1
909 West Main Suite 4
Manchester, IA 52057

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Nutrient Reduction Requirements

In support of the Iowa Nutrient Reduction Strategy you shall prepare and submit a report that evaluates the feasibility and reasonableness of reducing the amounts of nitrogen and phosphorus discharged into surface water. The report shall be submitted no later than **July 1, 2022** and shall address the following:

- A description of the existing treatment facility with particular emphasis on its capabilities for removing nitrogen and phosphorus. The description shall include monitoring data that define the current amounts of total nitrogen and total phosphorus in both the raw wastewater and the final effluent.

- A description and evaluation of operational changes to the existing treatment facility that could be implemented to reduce the amounts of total nitrogen and total phosphorus discharged in the final effluent and the feasibility and reasonableness of each. Your evaluation must discuss the projected degree of total nitrogen and total phosphorus reduction achievable for each operational change. When evaluating feasibility you must consider what, if any, effect operational changes would have on the removal of other pollutants (e.g. $CBOD_5$, TSS). When evaluating reasonableness you shall include estimates of the additional cost, if any, to implement such changes and for a publicly-owned treatment works the impact on user rates.

- A description and evaluation of new or additional treatment technologies that would achieve significant reductions in the amounts of total nitrogen and total phosphorus discharged in the final effluent with a goal of achieving annual average concentrations of 10 mg/L total nitrogen and 1 mg/L total phosphorus for plants treating typical domestic strength sewage. For purposes of this evaluation typical domestic sewage is considered to contain approximately 25 – 35 mg/L total nitrogen and 4 - 8 mg/L total phosphorus. For plants treating wastewater with total nitrogen and/or total phosphorus concentrations greater than typical domestic strength sewage, the evaluation shall include the projected reductions in the total nitrogen and phosphorus effluent concentrations achievable with the application of feasible and reasonable treatment technology with a goal of achieving at least a 66 % reduction in nitrogen and 75% reduction in total phosphorus. For each treatment technology the report shall assess its feasibility, reasonableness, practicability, the availability of equipment, capital costs, annual operating costs, impact on user rates and any non-water quality environmental impacts (e.g. additional air pollution, increased sludge production, etc.).

- Based on the evaluations of operational changes and new or additional treatment technologies the report must select the preferred method(s) for reducing total nitrogen and total phosphorus in the final effluent, the rationale for the selected method(s) and an estimate of the effluent quality achievable.

- In addition to selecting operational changes and/or new or additional treatment technologies, the permittee may evaluate and propose to implement practices within the watershed that may achieve greater reductions in nitrogen and phosphorous than the preferred method(s) alone. Such evaluations are particularly encouraged when no feasible or reasonable operational changes or additional treatment technologies can be identified or when the schedule for installing the selected technology exceeds ten years.

- The report must include a schedule for making operational changes and/or installing new or additional treatment technologies to achieve the concentration and/or percentage removal goals listed above. Additional financial justification must be included in the report if no operational changes or treatment technologies are feasible or reasonable.

The schedule will be incorporated into the NPDES permit by amendment. Effluent discharge limits will be based on one full year of operating data after implementation of the operational changes or completion of plant modifications and a six month optimization period.
The report shall be sent to the following address:
Ann Seda
NPDES Section
Iowa Department of Natural Resources
502 East 9th Street
Des Moines, Iowa 50319

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"}***

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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.

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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
WASTE LOAD ALLOCATION

City of New Hampton

(Proposed facility upgrade)

(Please do not microfiche this document.)

This Package Contains

WASTELOAD ALLOCATION CALCULATIONS & NOTES

Please Do Not Separate

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS

Facility Name: New Hampton, City of STP — Sewage File Number: 6-19-70-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 001	**ADW = 1.17 MGD & AWW = 3.2 MGD**			
CBOD5	Secondary Treatment Levels Will Not Violate WQS			
COD	41	41	1091	1091
Total D.O.	Minimum Concentration (mg/l)			
January - December	5.0			
Ammonia – Nitrogen*				
January	3.6	15.2	92.7	405.6
February	4.2	14.2	107.5	379.1
March	3.6	14.7	92.7	392.2
April	1.6	15.7	41.5	419.2
May	1.8	15.2	47.3	405.5
June	1.4	14.5	35.6	385.6
July	1.1	**15.6**	27.4	**360.3**
August	1.0	**14.7**	26.0	**341.6**
September	1.1	16.5	28.8	440.3
October	1.6	15.7	42.3	419.2
November	2.4	14.7	63.2	392.1
December	2.6	16.0	67.4	426.2
Bacteria	Geometric Mean (#org./100 ml)		March 15th – November 15th	
E. coli	212			
Chloride	394	630	10,420	16,791
Sulfate	1,516	1,516	40,417	40,417
TRC**	0.0080	0.019	0.21	0.51
pH	6.5-9.0 Standard Units			

Major Facility Acute WET Testing Ratio: Use 99.9% of effluent and 0.1% of dilution water for the testing

Stream Network/Classification of Receiving Stream: Spring Branch (A2, B(WW-2)) to the Little Wapsipinicon River (A2, B(WW-2)) to the Wapsipinicon River (A1, B(WW-1), HH)

Annual critical low flows in Spring Branch at the outfall:
1Q10 flow 0.1 cfs, 7Q10 flow 0.1 cfs, 30Q10 flow 0.1 cfs, 30Q5 flow 0.1 cfs, harmonic mean flow 0.1 cfs

Excel spreadsheet calculations [X] Qual II E model [ ] Qual II E modeling date [ ]

Performed by: Alex Martin

*The **bold** values are governed by the CBOD5/DO modeling, the others are ammonia nitrogen toxicity based.
**Only required if chlorine is used for disinfection.

Antidegradation Review Requirement

A tier II antidegradation review is required. See Section 2 for details.

Please note that 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: New Hampton, City of STP — Sewage File Number: 6-19-70-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 001	**ADW = 1.17 MGD & AWW = 3.2 MGD**			
Toxics				
1,1,1-Trichloroethane	2.644E+01	2.644E+01	7.049E+02	7.049E+02
1,1-Dichloroethylene	3.162E+01	5.407E+01	4.287E+02	1.442E+03
1,2-Dichloroethane	1.648E+00	5.908E+01	2.234E+01	1.575E+03
1,2-Dichloropropane	6.680E-01	6.680E-01	9.057E+00	9.057E+00
2,3,7,8-TCDD (Dioxin)	2.271E-10	2.271E-10	3.079E-09	3.079E-09
3,3-Dichlorobenzidine	1.247E-03	1.247E-03	1.691E-02	1.691E-02
4,4' DDT	1.014E-06	1.102E-03	2.682E-05	2.937E-02
Aldrin	2.227E-06	3.004E-03	3.019E-05	8.010E-02
Aluminum	9.023E-01	2.503E+00	2.387E+01	6.675E+01
Antimony	1.472E+00	1.102E+01	2.520E+01	2.937E+02
Arsenic (III)	1.521E-01	3.405E-01	3.019E+00	9.079E+00
Barium	2.053E+02	2.053E+02	5.474E+03	5.474E+03
Benzene	2.271E+00	1.652E+01	3.079E+01	4.406E+02
Benzo(a)Pyrene	8.016E-04	8.016E-04	1.087E-02	1.087E-02
Beryllium	5.007E-01	5.007E-01	1.335E+01	1.335E+01
Bis(2-ethylhexyl)phthalate	9.797E-02	9.797E-02	1.328E+00	1.328E+00
Bromoform	6.234E+00	6.234E+00	8.454E+01	8.454E+01
Cadmium	1.393E-03	6.314E-03	3.684E-02	1.606E-01
Carbon Tetrachloride	7.125E-02	2.158E+01	9.661E-01	5.754E+02
Chlordane	4.359E-06	2.403E-03	1.153E-04	6.408E-02
Chlorobenzene	3.680E+00	1.612E+01	6.299E+01	4.299E+02
Chlorodibromomethane	5.789E-01	5.789E-01	7.850E+00	7.850E+00
Chloroform	2.093E+01	2.093E+01	2.838E+02	2.838E+02
Chloropyrifos	4.157E-05	8.311E-05	1.100E-03	2.216E-03
Chromium (VI)	1.159E-02	1.632E-02	3.067E-01	4.351E-01
Copper	1.710E-02	2.694E-02	4.524E-01	7.182E-01
Cyanide	5.272E-03	2.203E-02	1.395E-01	5.874E-01
Dichlorobromomethane	7.570E-01	7.570E-01	1.026E+01	1.026E+01
Dieldrin	2.405E-06	2.403E-04	3.261E-05	6.408E-03
Endosulfan	5.677E-05	2.203E-04	1.502E-03	5.874E-03
Endrin	3.650E-05	8.612E-05	9.656E-04	2.296E-03
Ethylbenzene	4.829E+00	2.268E+01	8.268E+01	6.048E+02
Fluoride	8.088E+00	8.088E+00	2.157E+02	2.157E+02
gamma-Hexachlorocyclohexane (Lindane)	9.513E-04	9.513E-04	2.537E-02	2.537E-02
Heptachlor	3.518E-06	5.207E-04	4.770E-05	1.388E-02

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY-BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS

Facility Name: New Hampton, City of STP Sewage File Number: 6-19-70-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 001	**ADW = 1.17 MGD & AWW = 3.2 MGD**			
Toxics				
Heptachlor epoxide	1.737E-06	5.207E-04	2.355E-05	1.388E-02
Hexachlorobenzene	1.291E-05	1.291E-05	1.751E-04	1.751E-04
Hexachlorocyclopentadiene	2.530E+00	2.530E+00	4.331E+01	4.331E+01
Iron	1.001E+00	1.001E+00	2.670E+01	2.670E+01
Lead	7.799E-03	1.977E-01	2.063E-01	5.271E+00
Mercury (II)	3.450E-04	1.649E-03	5.906E-03	4.398E-02
Nickel	9.506E-02	8.445E-01	2.515E+00	2.252E+01
Nitrate as N	3.204E+02	3.204E+02	8.544E+03	8.544E+03
Nitrate+Nitrite as N	1.014E+02	3.204E+02	2.682E+03	8.544E+03
para-Dichlorobenzene	4.369E-01	2.003E+00	7.480E+00	5.340E+01
Parathion	1.318E-05	6.509E-05	3.487E-04	1.736E-03
Pentachlorophenol (PCP)	2.266E-02	2.918E-02	5.996E-01	7.780E-01
Phenols	5.069E-02	2.503E+00	1.341E+00	6.675E+01
Polychlorinated Biphenyls (PCBs)	2.850E-06	2.003E-03	3.864E-05	5.340E-02
Polynuclear Aromatic Hydrocarbons (PAHs)	5.714E-05	3.004E-02	1.065E-03	8.010E-01
Selenium	5.069E-03	1.933E-02	1.341E-01	5.153E-01
Silver	1.248E-02	1.248E-02	3.329E-01	3.329E-01
Tetrachloroethlyene	1.470E-01	1.470E-01	1.993E+00	1.993E+00
Thallium	1.081E-03	5.988E-01	1.850E-02	1.597E+01
Toluene	9.524E-02	2.701E+00	1.776E+00	6.868E+01
Toxaphene	2.028E-06	7.310E-04	5.365E-05	1.949E-02
trans-1,2-Dichloroethylene	3.220E-01	3.220E-01	5.512E+00	5.512E+00
Trichloroethylene (TCE)	8.110E-02	4.006E+00	2.146E+00	1.068E+02
Vinyl Chloride	1.069E-01	1.069E-01	1.449E+00	1.449E+00
Zinc	2.159E-01	2.159E-01	5.756E+00	5.756E+00

WLAs/Permit Limits for the City of New Hampton's Mechanical Plant

These wasteload allocations and water quality-based permit limitations are for the City of New Hampton's wastewater discharge. 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 New Hampton discharges treated domestic wastewater from a mechanical wastewater treatment facility (activated sludge) into Spring Branch (at 43° 02' 44.79" N, 92° 19' 02.16" W). The City of New Hampton currently discharges from a trickling filter wastewater treatment facility.

Route of flow and use designations:

Spring Branch is an A2, B(WW-2) designated use waterbody. It flows into the Little Wapsipinicon River (A2, B(WW-2)) into the Wapsipinicon River (A1, B(WW-1), HH). 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 Spring Branch at the outfall 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 Wapsipinicon River at the mouth of the Little Wapsipinicon River are estimated based on the Drainage Area Ratio (DAR) 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 05420560, located on the Wapsipinicon River near Elma, Iowa.

Table 1: Annual critical low flows

Location	D.A. (mi^2)	1Q10 (cfs)	7Q10 (cfs)	30Q10 (cfs)	30Q5 (cfs)	Harmonic Mean (cfs)
Spring Branch at the outfall	1.81	0.1	0.1	0.1	0.1	0.1
Wapsipinicon River at the mouth of the Little Wapsipinicon River	164	5.82	6.55	7.59	9.41	25.0
Wapsipinicon River at the USGS gage 05420560	95.2	3.42	3.85	4.46	5.53	14.7

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 design capacity shown on the request form.
2	Significant Industrial Users (SIU) contributing new pollutant of concern (POC)	Yes ☐, No ☐, or Not Applicable ☒	
3	New process contributing new pollutant of concern (POC)	Yes ☐, No ☐, or Not Applicable ☒	1: Note that if chlorine is utilized for disinfection in the future an antidegradation review will be required.
4	Less stringent water quality-based limits?	Yes ☒, No ☐, or Not Applicable ☐	1: Less stringent ammonia nitrogen, aluminum, or copper limits will trigger an antidegradation review.
5	Outfall location change	Yes ☐, No ☒, or Not Applicable ☐	
Conclusion and discussion: Due to Items 1 and 4, a tier II antidegradation review is required. Please note that 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 2020 impaired waters list:

- Wapsipinicon River for bacteria (indicator bacteria – *E. coli*)
- Mississippi River for metals (aluminum), bacteria (indicator bacteria – fecal coliform), and toxic organics (PCBs)

The City of New Hampton has not received any TMDL allocations at this time.

Please note that 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 Average Dry Weather (ADW) design flow of 1.17 MGD and its Average Wet Weather (AWW) design flow of 3.2 MGD.

Please note that 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 ADW design flow, while the loading limits are derived using the allowed stream flow and the 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.

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 Spring Branch at the outfall are used as the Mixing Zone (MZ) and the Zone of Initial Dilution (ZID), respectively.

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 downstream 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 25% of the 30Q5 flow in the Wapsipinicon River at the mouth of the Little Wapsipinicon River.

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 25% of the harmonic mean flow in the Wapsipinicon River at the mouth of the Little Wapsipinicon River.

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.

Please note that the TRC limits are based on a sampling frequency of 5/week, based on a design population equivalent (PE) of 28,341; the limits for other toxics are based on a sampling frequency of 1/week.

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 Spring Branch.

Based on the ratio of the stream flow to the discharge flow, 5.0% of the 1Q10 flow and 100% of the 30Q10 flow in Spring Branch at the outfall are used as the ZID and the MZ, respectively. Spring Branch is a B(WW-2) stream; therefore, early life protection will begin in April and run through September.

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	15.2	3.6	15.2	3.5
February	14.2	4.2	14.2	4.0
March	14.7	3.6	14.7	3.5
April	15.7	1.6	15.7	1.6
May	15.2	1.8	15.2	1.8
June	14.5	1.4	14.4	1.3
July	17.6	1.1	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	2.4	14.7	2.4
December	16.0	2.6	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 ADW and 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 0.00161 (the water channel elevation changes from 1,100 ft to 1,046 ft over a distance of approximately 6.4 miles, estimated based on the GIS LiDAR 2-ft contour coverage).

Field Use Attainability Assessment (UAA) had four sites along Spring Branch. Two observations of stream width, average depth, and velocity were made at each site. Based on these UAA data, stream 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	1.91	11.8	0.28	0.58
7Q10 + AWW	5.05	13.3	0.43	0.88

Reaeration:
The USGS pool-riffle model (Melching and Flores, 1999) was used as pools and riffles are noted in the UAA data.

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) 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; however, some of the calculated water quality-based ammonia nitrogen wasteload allocations, as shown in Table 5, need to be reduced. The final ammonia nitrogen limits are shown on Page 1 of this report.

COD:
It is conservatively assumed that ultimate CBOD (CBODu) is approximately equivalent to COD and that all COD will be biologically available in the stream.

The CBODu was estimated using the following equation:

$$CBODu = CBOD5*(1/(1-\exp(-5*K_d))$$

Where K_d is the CBOD decay rate for a given month, which in turn was determined by the following equation:

$$K_d = K_{20}*1.047^{(T-20)}$$

Where T is the monthly effluent temperature, as shown in Table 4. K_{20} is the CBOD decay rate at 20 °C, which is determined using the following equation:

$$K_{20} = K_{d0} + b * (V/d)$$

Where K_{d0} is the laboratory CBOD decay rate at 20 °C, the value is assumed to be 0.2/day. b is the bed activity coefficient, determined to be 0.212. V is the flow velocity, as shown in Table 6. d is the depth, as shown in Table 6.

The COD concentration limit was determined to be 41 mg/l, and the mass loading was 1091 lbs/day, which was derived based on the AWW-based concentration limit of 41 mg/l.

***E. coli*:**
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."

Downstream Class A1 limits:
Spring Branch flows into the Little Wapsipinicon River, which flows into the Wapsipinicon River, a Class A1 waterbody, about 7.3 miles downstream of the outfall. 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. *E. coli* decay in Spring Branch and the Little Wapsipinicon River is taken into consideration. A first order decay model with a decay rate of 1.0 per day at 20°C and assumed velocities of 0.88 fps in Spring Branch and 0.67 fps in the Little Wapsipinicon River are used to estimate the decay. With decay, a geometric mean of 212 org./100 ml and a sample maximum of 396 org./100 ml are protective of the A1 designated use.

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 212 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 default hardness for background and effluent is 200 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 Spring Branch 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 Spring Branch 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 Spring Branch at the outfall.

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:
Use 99.9% of effluent and 0.1% of dilution water for the testing. The ratio is calculated using the ADW design flow and 2.5% of the 1Q10 flow in Spring Branch 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 C
PUBLIC COMMENT RESPONSES