LOCAL LIMITS EVALUATION REPORT

Town of Windsor

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COMMITMENT & INTEGRITY DRIVE RESULTS

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LIST OF ABBREVIATIONS

ADWF	Average Dry Weather Flow
AHL	Allowable Headworks Loading
BOD	Biological Oxygen Demand
BMP	Best Management Practices
CFR	Code of Federal Regulations
DNQ	Detected but Not Quantified
ESD	Equivalent Single-Family Dwellings
gpd	gallons per day
lb/day	pounds per day
IU	Industrial User
MAHL	Maximum Allowable Headworks Loading
MAIL	Maximum Allowable Industrial Loading
µg/L	micrograms/liter
mg/L	milligrams/liter
MDL	Method Detection Limit
MGD	Million Gallons per Day
N	Nitrogen
NPDES	National Pollutant Discharge Elimination System
PCBs	Poly-Chlorinated Biphenyls
PF	Peaking Factor
POTW	Publicly-Owned Treatment Works
SIU	Significant Industrial User
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TSS	Total Suspended Solids
TTOs	Total Toxic Organics
USEPA	United States Environmental Protection Agency
WRF	Water Reclamation Facility
WWCF	Wastewater Capacity Fee

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EXECUTIVE SUMMARY

The Town of Windsor (Town) establishes local limits for specific pollutants in its General Ordinance in the Town's Municipal Code (Ordinance). In this report, the Town has re-evaluated its local limits to determine whether existing local limits are sufficient to protect its Water Reclamation Facility (Facility) from exceeding effluent limitations contained in its National Pollutant Discharge Elimination System (NPDES) permit, as well as enable the Town to meet its other compliance and operational requirements and objectives.

The evaluation methodology follows the procedures documented in the United States Environmental Protection Agency (USEPA) July 2004 *Local Limits Development Guidance.* In re-evaluating local limits, the Town considered treatment plant operational and regulatory criteria, including:

- Meeting NPDES permit effluent limitations
- Maintaining recycled water quality
- Meeting biosolids quality requirements based on current reuse and disposal methods
- Preventing interference with plant treatment processes
- Maintaining worker health and safety

For each pollutant of concern, this report identifies allowable headworks loadings that will ensure that reclamation facility or treatment plant (publicly owned treatment works, or POTW) operational and regulatory requirements and objectives are achieved. The lowest (most stringent) of the allowable headworks loadings for each of these pollutants was designated as the maximum allowable headworks loading (MAHL). For biological oxygen demand (BOD), total suspended solids (TSS), and ammonia, the MAHL was determined from the rated design capacity of the Facility.

The determination for whether existing local limits should be revised or new local limits should be developed was based in part on the ratio of actual treatment plant influent loading to MAHL. The results indicate that the Town's current local limits should be revised as follows:

- **Copper, Zinc, and Total Dissolved Solids (TDS).** Maximum influent loading of these toxic constituents exceeded 80% of the MAHL. Additional sampling and investigation are needed to confirm the source of the influent loading to the Facility and if local limits revisions are necessary. It is possible that the high influent loadings observed may be due to copper corrosion in the water system and seasonal factors. The loading appears to be associated with the entire water and/or wastewater flow such that the loading is not controllable by the commercial and/or industrial sector, and therefore, modifications to the local limits for industrial dischargers may have limited impact loading into the Facility.
- **Conventional Pollutants: BOD, TSS, Ammonia, and Phosphorus.** Maximum influent loading of BOD, TSS, and ammonia exceeded 80% of the MAHL, exceeding the Facility's current rated design capacity. The Town is in the process of planning an improvements project that would both re-evaluate the current design capacity assumptions and upgrade the Facility's capacity. In the interim, the local limits for these constituents are determined to be too high to be sufficiently protective, and a revised, flow-based structure of mass-based limits is proposed. Phosphorus is also established as a new local limit within this structure. Although there is currently no existing local limit for phosphorus and there is available loading capacity based on the calculated MAHLs, the Town is interested in establishing a phosphorus local limit to address the "no net loading" effluent limitation. Note that the Town is required by provisions in its NPDES permit to purchase phosphorus credits for each pound of phosphorus discharged to receiving waters, but not for phosphorus discharged to the Geysers recharge pipeline or to recycled water irrigation customers).

- **Other Existing Local Limits.** There are a number of constituents with existing local limits where limited monitoring data was not available for the analysis, including: cyanide, beryllium, aluminum, barium, cobalt, fluorides, formaldehydes, iron, and manganese. Additional sampling is also recommended for these constituents to characterize the current loads and to determine if the local limits are adequate for the protection of the POTW, meeting compliance and operational objectives, and worker health and safety. Cyanide especially should be prioritized, as new effluent limits for this constituent were recently established in the Town's current NPDES Permit.

1. INTRODUCTION

The Town of Windsor (Town) owns and operates a Water Reclamation Facility (WRF or Facility), a publicly-owned treatment works (POTW) regulated under National Pollutant Discharge Elimination System (NPDES) Permit Number CA0023345 (Permit). This Permit was previously issued as Order No. R1-2013-0042 and recently reissued by the North Coast Regional Water Quality Control Board (Regional Water Board) to the Town (as the Windsor Water District) under Order No. R1-2020-0010 with an effective date of October 1, 2020. In this report, the Town and Windsor Water District will be referenced and are one and the same.

The purpose of this report is to assist the Town's Department of Public Works in the evaluation of its local limits, which are the local pretreatment program standards for wastewater discharge from industrial facilities.
The Permit (page F-74) contains the following language describing the source control and pretreatment provisions (Provision VI.C.5.b):

> *40 C.F.R. section 403.8(a) requires POTWs with a total design flow greater than 5 mgd and receiving pollutants which pass through or interfere with the operation of the POTW to establish a POTW Pretreatment Program. The Regional Water Board may also require that a POTW with a design flow of 5 mgd or less develop a POTW Pretreatment Program if the nature or volume of the industrial influent, treatment process upsets, violations of POTW effluent limitations, contamination of municipal sludge, or other circumstances warrant in order to prevent interference or pass through. The average dry weather design flow of the Facility is less than 5 mgd; therefore, the Order does not require the Permittee to develop a pretreatment program that conforms to federal regulations.*

The Town does not implement an industrial pretreatment program pursuant to the requirements of 40 CFR Part 403 because of the size of the WRF design flow and because it does not currently receive pollutants from any industrial users (IUs) that are subject to 40 CFR Part 403 pretreatment standards. However, Local Limits are established in the Town's Municipal Code Section 12-4-407 in order to protect against interference and pass through. The Town has also found in the past that setting local limits has been beneficial to the Town in protecting its recycled water quality, its effluent quality, and the quality of its biosolids. All significant industrial users (SIUs) discharging to the Facility are required to comply with the local limits; although, there are currently no classified SIUs discharging to the Town's WRF.

This report includes a description of the process used to assess the appropriateness of the Town's current local limits and an evaluation of the need to revise local limits. Because the Town's pretreatment program is not pursuant to the requirements of 40 CFR Part 403, changes to its local limits are not subject to review and/or approval by the Regional Water Quality Control Board or USEPA.

2. LOCAL LIMITS EVALUATION PROCESS

2.1 Reasons for Re-evaluation

The Town adopted its current Local Limits along with significant updates to its sewer ordinance in July 2010. The Town is interested in a re-evaluation of its local limits at this time in preparation for potential growth in the food and beverage manufacturing sector, particularly wineries and breweries, within its service area. The Town would particularly like to assess the effectiveness of the local limits for the following conventional parameters in protecting the Facility: biochemical oxygen demand (BOD), total suspended solids (TSS), total Kjeldahl nitrogen (TKN) as ammonia, and phosphorus.

This local limits evaluation is based on the United States Environmental Protection Agency's (USEPA)July 2004 *Local Limits Development Guidance* (833-R-04-002A) (Local Limits Guidance) and takes into consideration the following changes since the Town's local limits adoption:

- The number of industrial users in the food and beverage manufacturing sector has been growing in recent years. The Town would like to assess the effectiveness of the current BOD, TSS, and TKN local limits, as well as alternative control options to manage this industrial loading. The Facility is currently constrained in its biological treatment process capacity, which makes the timing of this need more immediate.
- The WRF is subject to revised effluent limits because of its renewed NPDES permit, which contains new limits for cyanide and lead, as well as "no net loading" of total phosphorus to all waters discharged to Mark West Creek, effective October 1, 2022.
- The Town is currently exploring potential alternative uses for its biosolids, including alternative methods of processing those biosolids. Updating the local limits could improve the protection of biosolids processing and end product quality at the Facility.

For reference, the Town's current local limits are listed in **Appendix A.**

2.2 Evaluation Process

This local limits evaluation follows a four-step process from the Local Limits Guidance, and each of these steps is described further in this report as follows:

Step 1. Assess current conditions to determine whether existing Maximum Allowable Headworks Loadings (MAHLs) should be recalculated or reallocated, or additional local limits should be developed. Also determine which pollutants need to be further evaluated and for which criteria.

> **Chapter 3** of this report describes current conditions at the Facility and the assessment of pollutants to determine which require further evaluation. MAHLs were recalculated for all pollutants of concern identified during this assessment.

Step 2. Based on the pollutants and criteria identified in Step 1, determine whether existing data are sufficient.

> Existing data were sufficient to conduct the initial evaluation, as described in **Chapter 4** of this report. Data sources are described in **Section 3.3**.

Step 3. Recalculate the MAHLs of pollutants for which local limits have been developed and determine MAHLs for new pollutants.

Chapter 5 of this report provides the MAHL calculations for all pollutants of concern as determined according to the screening described in Chapter 3 and compares those MAHLs to actual influent loading to determine whether any pollutants require revised local limits.

Step 4. Implement the local limits.

Chapter 6 of this report includes proposed revisions for the Town's existing conventional parameters' local limits, as well as recommendations for next steps associated with other local limits.

3. LOCAL LIMITS ASSESSMENT

3.1 Facility Description and History

The Town owns and operates the Facility, which provides tertiary treatment of wastewater from residential, commercial, and industrial customers within the Town of Windsor. The wastewater treatment facilities include biological secondary treatment, utilizing extended air activated sludge aeration basins and secondary clarifiers; advanced wastewater treatment (AWT), including chemical addition facilities, flocculation tanks, AWT clarifiers, and sand filters; ultraviolet (UV) disinfection; and storage prior to water recycling, discharge to the Geysers recharge pipeline, and/or discharge to Mark West Creek. A portion of the treated and UV disinfected effluent is transferred to Windsor High School and Windsor Fire Station, either for landscape irrigation or for toilet flushing after chlorination.

The Facility is permitted to discharge its advanced treated wastewater to Mark West Creek up to 10 percent of the natural flow of Mark West Creek during the period from November 1 through April 30 each year. In addition, discharges of advanced treated wastewater during the periods of October 1 through October 30 and May 1 through May 14 of each year is permitted up to 1 percent of Mark West Creek flow. The Facility is prohibited from discharge to Russian River and its tributaries, including Mark West Creek, from May 15 through September 30 of each year. Any prohibited discharge from Facility effluent is stored and recycled.

Sludge generated at the Facility is stabilized and stored in two main sludge ponds. A third auxiliary pond is currently utilized for effluent storage but may be converted to a sludge stabilization pond in the future. The sludge is typically pumped out of the ponds annually for beneficial land application of biosolids by a contractor, typically Synagro, in Sacramento and Solano counties. The Town has also removed small quantities of biosolids to a compost facility in Merced County but typically only removes biosolids for use directly in land application. The Town does not accept any septage or bulk loads into the Facility.

3.2 Existing Pretreatment Program and Local Limits

The Town is not required to implement an industrial pretreatment program pursuant to the requirements of 40 CFR Part 403, but local limits are established to protect the WRF from industrial discharges that may inhibit or otherwise interfere with plant operations. The Town's current General Ordinance (Ordinance) is the Town's primary control mechanism for its Pretreatment Program. Municipal Code Section 12-4-407 of the Ordinance establishes the local limits and applies to all SIUs or other users deemed by the General Manager (as served by the Windsor Town Manager) discharging to the Town's Facility whether or not they are subject to National Categorical Pretreatment Standards or any other Federal, State, or local pretreatment standards or requirements. The Town adopted its current Local Limits along with significant updates to its sewer ordinance in July 2010 (**Appendix A**).

The Town also implements a permitting and inspection program for commercial and industrial facilities discharging to the Town's sewer system. Grease removal devices are required at food service facilities and inspected as part of the Town's Fats, Oils and Grease (FOG) control program. The Town adopted an Enforcement Response Plan in 2018 to provide a response framework for instances of noncompliance.

Aside from the local limits for SIUs, the Town and Windsor Water District also collects monthly sewer charges from residential and commercial dischargers, with commercial rates being strength based as defined in its wastewater rates. Although the Town's Municipal Code Section 12-4-410 references wastewater treatment surcharge for industrial users, surcharge billing for industrial users has not been utilized because it was designed for SIUs. The Town currently does not have any SIUs and does not currently have surcharge provisions in the wastewater rate structure to account for surcharges from SIUs.

The Reed Group, Inc. completed a rate update study for the Town in March 2020, which identified customized wastewater usage rates for special situations. Businesses identified as having special wastewater characteristics "may include wineries, breweries, food processors or other unique and/or significant wastewater discharge characteristics that fall outside of the strength ranges for standard low, medium, and high strength categories." These new rates were adapted and adopted by the Town, effective beginning January 2021. They are applicable to situations with unique wastewater discharge characteristics, as determined by the Director of Public Works, with the following monthly 2021 rates: $11.10 per 1,000 gallons of flow, $2.05 per pound of BOD, and $2.94 per pound of TSS (The Reed Group, Inc., 2020). Recommendations for how these new wastewater rates could be utilized in conjunction with the recommended local limits are discussed in **Chapter 6**.

3.3 Data Sources

Data collected over the five-year period January 2015 – December 2019 were used in this evaluation, reflecting the most recent five full calendar years. In particular, the following data were used in the evaluation:

- WRF influent and effluent monitoring data for flow rate, BOD, TSS, ammonia as nitrogen (as N), and total phosphorus
- WRF influent, effluent, and biosolids monitoring data for priority pollutants
- Industrial user monitoring data for flow rate, BOD, and TSS

Although only Facility effluent discharged to Mark West Creek is subject to receiving water quality criteria, all Facility effluent, including during the discharge prohibition season, is evaluated against receiving water criteria in the assessment for conservatism and comprehensiveness. As such, the effluent in this analysis was represented by monitoring data from monitoring location REC-003A instead of EFF-002 as described in the R1-2013-0042 permit. REC-003A is a sampling point at the effluent end of the UV disinfection system capturing all effluent regardless of if the effluent is discharged to the effluent ponds prior to water recycling, discharged to the Geysers recharge pipeline, or discharged to Mark West Creek. Note that in the current R1-2020-0010 permit, the same location is specified as monitoring location REC-001. On the other hand, monitoring location EFF-002 marks discharge specifically to Mark West Creek, after effluent storage ponds but before the effluent contacts the receiving water.

The majority of the WRF data used for this assessment have been previously submitted to the Regional Water Board in self-monitoring reports, Annual Reports of Pretreatment Activities, and Annual Reports of Solids Disposal. Those data were supplemented with additional information provided by the Town. Plots of influent, effluent, and industrial data listed above are included in **Appendix B.**

3.4 Screening for Pollutants of Concern

The list of "pollutants of concern" that warrant further evaluation was developed prior to more detailed evaluation. Constituents were screened for inclusion if they met any of the following criteria:

A. **Current Local Limits.** All constituents with local limits under the Town's Ordinance were initially included. Constituents that contribute to total phenols, pesticides, or PCBs were considered individually rather than in sum (see Item G below). The Town's current local limits are listed in **Appendix A** of this report.

B. **National Pollutants of Concern**. This is a list of 15 pollutants identified by USEPA that are often found in biosolids and effluent of POTWs. The Town conducts biosolids or effluent monitoring of all 15 of these pollutants.

C. **Existing Effluent Limitations.** The Town's recently renewed Permit contains limits for BOD, TSS, pH, cyanide, lead (impact ratio), total nitrogen, and total phosphorus. The lead effluent limit was evaluated in terms of the associated water quality objective.

D. **Biosolids.** The Town's biosolids are recycled through its land application program and are subject to regulations found within 40 CFR §503.13 Table 3. This federal regulation includes limits on nine metals, all of which are also found on the national pollutants of concern list (see Item B above).

E. **Constituents with Potential for Treatment Plant Interference**. Town staff have not observed inhibition of treatment processes caused by specific constituents. Therefore, the screening for treatment plant interference was based on literature values found in Appendix G of the Local Limits Guidance for inhibition of activated sludge and nitrification. Only those constituents that were detected in effluent, influent, or biosolids were considered (see Item G below).

F. **Constituents with Potential to Endanger the Treatment Works, Collection System, and Workers.** Appendices I and J of the Local Limits Guidance list constituents that may be explosive or produce toxic fumes. Only those constituents that were detected in effluent, influent, or biosolids were considered (see Item G below).

G. **Organic Constituents Detected in Influent or Effluent**. Individual constituents were included only if they were detected in either the influent or effluent at levels above the reporting limit or between the reporting limit and method detection limit (Detected-Not-Quantified, or DNQ). If so, additional screening was performed as described below.

   The data set for most organic constituents in Facility influent, effluent, and biosolids consists primarily of non-detects, estimated values, and/or detections at very low concentrations. Each of the potential constituents of concern received further screening using the procedures described below to determine whether its presence would potentially warrant a revised or new local limit. This approach is preferable to immediately calculating a MAHL for each organic constituent because of the significant bias introduced into the MAHL calculations by non-detects and estimated values.

3.4.1 Screening of Biosolids Data

Since all the Town's biosolids are currently disposed of via land application, the only applicable biosolids objectives are for metals – there are no applicable objectives for organic pollutants. Constituents with existing local limits were not included in this preliminary screening step because they were automatically included in the list of pollutants of concern.

Molybdenum is the only national pollutant of concern that was monitored in biosolids but not in the influent or effluent. Annual biosolids sampling data for molybdenum are available for when biosolids were removed from the sludge ponds. Between 2015 and 2019, the highest detected molybdenum concentration in biosolids was 20 mg/kg, much lower than the corresponding 40 CFR §503.13 landfill application ceiling concentration of 75 mg/kg. As such, molybdenum was excluded from further analysis.

3.4.2 Screening of Influent and Effluent Data

Concentrations of constituents detected in the Facility influent and effluent were compared with the lowest applicable criteria among the following:

- Effluent limits in the City's NPDES permits (Tables 4-6 of Order No. R2-2013-0042 and No. R1-2020-0010)

- Lowest applicable water quality criteria identified in the Reasonable Potential Analysis for Priority Pollutants (Attachment F-1 of Order No. R2-2013-0042 and No. R1-2020-0010)
- National Drinking Water Primary and Secondary Maximum Contaminant Levels (MCLs), as well as Primary and Secondary MCLs established in Title 22 of the California Code of Regulations, Section 64431 (Inorganic Chemicals), Section 64444 (Organic Chemicals), and Section 64439 (Secondary MCLs)
- Inhibition values for activated sludge and nitrification from Appendix G of USEPA's Local Limits Guidance
- Fume toxicity, flammability screening, and worker exposure levels from Appendices H, I, and J of USEPA's Local Limits Guidance
- Water quality standards for acceptance into the Geysers recharge pipeline, per the Agreement to Convey Recycled Water By and Through Geysers Pipeline for Reuse (July 2007).

3.4.2.1 Priority Pollutants

Constituents that were only detected as a single occurrence out of all samples were eliminated during the screening process as outliers. It is not feasible to conduct a quantitative headworks loading analysis for constituents with just one detected value and removing them from the screening is consistent with Section 3.2.8 and Section 5.1.3 of USEPA's Local Limits Guidance. Constituents for which the influent and effluent maximum detected concentrations are less than half of the lowest criterion were not considered for further analysis either. All of the detected constituents in the influent and effluent either already have existing local limits and are automatically included in the screening process, or were not detected at maximum concentrations above half of the lowest and therefore removed from the screening. A detailed summary of the influent and effluent screening step for metals and organic constituents is shown below in **Table 3-1**.

3.4.2.2 Conventional Pollutants

The Town's current Permit contains effluent limits for pH such that the pH must remain between 6.5 to 8.5 for discharges to Mark West Creek. This effluent limit has consistently been met. Therefore, pH was not considered in this evaluation.

The Permit contains average monthly effluent limitations of 10 mg/L and an average monthly percent removal of not less than 85% for BOD and TSS; an average monthly effluent limitation of 10.5 mg/L for total nitrogen; as well as a compliance schedule and effluent limitations (an average monthly effluent limitation of 7.8 mg/L in R1-2013-0042) for total phosphorus. BOD, TSS, and total Kjeldahl nitrogen (as ammonia) are currently regulated directly in the Town Ordinance by local limits, but not total phosphorus. The Town is interested in implementing a new local limit for total phosphorus considering the "no net loading" requirement effective October 2022 and the associated effluent limitations implications. These conventional pollutants are included as part of the pollutants of concern screening and are further evaluated in the pollutants MAHL analysis.

3.4.2.3 Other Pollutants with Existing Local Limits

In addition to the detected priority pollutants shown in **Table 3-1**, the Town has other constituents with local limits under the Town's Ordinance. However, the majority of these constituents cannot be technically evaluated because there are limited data available. Recommendations for these constituents are discussed further in **Chapter 6**.

Some effluent data are available for cyanide, beryllium, and boron, but no influent data are available for evaluating removal efficiencies necessary for following evaluations. TDS is still included in the evaluation despite there only being effluent data available, as the constituent is not typically removed by Facility processes, so reasonable assumptions can be made for influent concentrations and removal efficiency. Although beryllium and cyanide are priority pollutants, they are not included in **Table 3-1** because they were not detected in the effluent samples that were available. A summary of the influent and effluent screening for these constituents with local limits is shown below in **Table 3-2**.

Table 3-1: Detected Priority Pollutants in Influent and/or Effluent

Constituent	Existing Local Limit	Lowest Applicable Criteria		Data Summary										Recommended MAHL?	
				Influent (INF-001)					Effluent (REC-003A)						
				Sample Count	# Detected Samples	% Detects	Max Value Detected		Sample Count	# Detected Samples	% Detects	Max Value Detected			
	mg/L	Value, µg/L	Basis[1]				Value	Unit				Value	Unit	Yes/No	Reason
Antimony	5	6	Primary MCL	5	4	80%	0.53	µg/L	5	5	100%	0.47	µg/L	Yes	Existing Local Limit
Arsenic	0.5	10	Primary MCL	5	5	100%	1.8	µg/L	5	3	60%	0.83	µg/L	Yes	Existing Local Limit
Cadmium	0.02	1.3	CCC: CTR Freshwater Chronic Criterion, 4-day avg	5	5	100%	0.32	µg/L	5	4	80%	0.086	µg/L	Yes	Existing Local Limit
Chromium	0.01	11	CCC: CTR Freshwater Chronic Criterion, 4-day avg	5	5	100%	8.2	µg/L	5	2	40%	0.66	µg/L	Yes	Existing Local Limit
Copper	0.5	16	CCC: CTR Freshwater Chronic Criterion, 4-day avg	5	5	100%	220	µg/L	5	5	100%	16	µg/L	Yes	Existing Local Limit
Lead	0.5	1.1	CCC: CTR Freshwater Chronic Criterion, 4-day avg	5	5	100%	2.3	µg/L	5	5	100%	0.34	µg/L	Yes	Existing Local Limit
Mercury	0.001	0.025	Statewide Mercury Objectives	5	4	80%	0.1	µg/L	5	3	60%	0.00041	µg/L	Yes	Existing Local Limit
Nickel	0.2	26	CCC: CTR Freshwater Chronic Criterion, 4-day avg	5	5	100%	11	µg/L	5	5	100%	4	µg/L	Yes	Existing Local Limit
Phenol[2]	0.5	4,000	Facility Inhibition (Nitrification)	5	5	100%	37	µg/L	5	0	0%	-	µg/L	Yes	Existing Local Limit
Selenium	5	5	CCC: CTR Freshwater Chronic Criterion, 4-day avg	5	4	80%	1.4	µg/L	5	1	20%	0.8	µg/L	Yes	Existing Local Limit
Silver	0.05	1	CMC: Basin Plan/CTR Freshwater Acute Criterion, 1-hr avg	5	5	100%	0.5	µg/L	5	1	20%	0.2	µg/L	Yes	Existing Local Limit
Zinc	1	59	CMC/CCC: Basin Plan/CTR Freshwater Criterion	5	5	100%	230	µg/L	5	5	100%	110	µg/L	Yes	Existing Local Limit
Chloroform	n/a	60	Fume Toxicity	5	3	60%	2.6	µg/L	5	1	20%	0.53	µg/L	No	Max value < 50% of Lowest Criteria
Di-n-butyl phthalate	n/a	2,700	CTR Human Health Criterion for Consumption of Water & Organisms	n/a	-	-	-	-	5	1	20%	2.6	µg/L	No	Max value < 50% of Lowest Criteria
Toluene	n/a	150	Primary MCL	2	2	100%	2.3	µg/L	5	0	0%	-	µg/L	No	Max value < 50% of Lowest Criteria
Trihalomethanes (total)	n/a	80	Primary MCL	2	1	50%	0.71	µg/L	5	1	20%	0.53	µg/L	No	Max value < 50% of Lowest Criteria

Notes:
1. CMC - criterion maximum concentrations, CCC - criterion continuous concentrations
2. The Town's current local limit is for "Phenol and derivatives" which represents an analytical method summarizing phenols as a group. Individual phenolic compounds were analyzed in treatment plant influent and effluent, but only single compound phenol was detected and included in the data summary.

Table 3-2: Other Constituents with Existing Local Limits and Limited Data

Constituent[1]	Existing Local Limit	Lowest Applicable Criteria		Data Summary										Recommended MAHL?	
				Influent (INF-001)					Effluent (REC-003A)						
				Sample Count	# Detected Samples	% Detects	Max Value Detected		Sample Count	# Detected Samples	% Detects	Max Value Detected			
	mg/L	Value, µg/L	Basis				Value	Unit				Value	Unit	Yes/No	Reason
Cyanide (total)	0.2	4.3	NPDES Effluent Limit, average monthly	n/a	-	-	-	-	4	0	0%	2	µg/L	No	Limited Data - Effluent only, Max value < 50% of Lowest Criteria
Beryllium	1	4	Primary MCL	n/a	-	-	-	-	5	0	0%	0.08	µg/L	No	Limited Data - Effluent only, Max value < 50% of Lowest Criteria
Boron[1]	1	2,000	Geysers Standards	n/a	-	-	-	-	61	61	100%	0.48	mg/L	No	Limited Data - Effluent only, Max value < 50% of Lowest Criteria
Total Dissolved Solids (TDS)	5,000	500,000	Secondary MCL	n/a	-	-	-	-	50	50	100%	520	mg/L	No	Limited Data - Effluent only, Max value < 50% of Lowest Criteria
Aluminum	5	200	Secondary MCL	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Barium	5	1,000	Primary MCL	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Total chlorinated hydrocarbons	0.002 (trace)	-	*Unknown - Likely related to groundwater cleanup*	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Cobalt	0.5	80,000	California Hazardous Waste Limit	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Fluorides	2	2000	Primary MCL	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Formaldehydes	5	-	*Unknown - Likely related to worker exposure and effluent toxicity*	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Iron	5	300	Secondary MCL	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Manganese	1	50	Secondary MCL	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Total Oil and Grease (non-floatable grease, oil, fat, ether-soluble matter other than soap)	500	-	Collection system and plant operations	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Total Petroleum Hydrocarbons (floatable grease, oil, fat, ether-soluble matter)	50	-	Collection system and plant operations; worker exposure	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available
Total Toxic Organics (TTO)	2.13	-	Likely based on Categorical Limits	n/a	-	-	-	-	n/a	-	-	-	-	No	No Data Available

Notes:
1. The Town previously misreported an effluent concentration of 36 mg/L for boron on 11/4/2015. Because this value was confirmed to have been misreported from the actual concentration of 0.36 mg/L, the 36 mg/L value is excluded from the screening.

3.4.3 Pollutants of Concern Analyzed for Maximum Allowable Headworks Loading

The final list of Pollutants of Concern, analyzed for MAHLs in **Chapter 5**, is shown in **Table 3-3**.

Table 3-3: Pollutants of Concern

Parameter	Primary Reason for Including as Pollutant of Concern
Antimony	Existing Local Limit
Arsenic	Existing Local Limit
Cadmium	Existing Local Limit
Chromium	Existing Local Limit
Copper	Existing Local Limit
Lead	Existing Local Limit
Mercury	Existing Local Limit
Nickel	Existing Local Limit
Phenol	Existing Local Limit
Selenium	Existing Local Limit
Silver	Existing Local Limit
Total Dissolved Solids (TDS)	Existing Local Limit
Zinc	Existing Local Limit
Biological Oxygen Demand (BOD)	Existing Local Limit
Total Suspended Solids (TSS)	Existing Local Limit
Total Kjeldahl Nitrogen (as Ammonia)	Existing Local Limit
Total Phosphorus	Effluent Limitation

4. DATA USED IN THE ANALYSIS

The Facility influent, Facility effluent, and industrial user monitoring data collected by the Town over the period 2015-2019 and described in **Section 3.3** were used to conduct this local limits evaluation. Concentrations were converted to mass loadings using the average flow rate (not average dry weather flow) during the period 2015-2019, which was 1.80 MGD.

4.1 Identification of Outliers in the Data Set

Influent and effluent concentration data were assessed to determine if any of the data points should be considered outliers, using information provided in the Local Limits Guidance. Outliers were not considered for the toxic pollutants because the data set was limited, with one influent and one effluent sample annually for each constituent. Outliers were also not considered for BOD, TSS, ammonia as nitrogen, and total phosphorus concentrations or loadings, to capture the full range of loading conditions for which the plant was designed. Therefore, no valid data points were considered outliers within the analysis.

4.2 Concentrations Below the Minimum Quantitation Level

To be conservative, constituents that were not detected were averaged at the method detection limit (MDL). Among the inorganic constituents, cadmium and silver had many sample results as non-detects in the effluent.

For removal efficiency and influent load calculations, concentrations flagged as “detected but not quantified” (DNQ) or “estimated” were included using the estimated value between the MDL and the minimum level of quantification, as provided by the laboratory.

4.3 Data Trends

In assessing whether new or revised local limits were needed for each pollutant, the loading was reviewed to determine if there were any substantial changes over the period 2015 to 2019. While the influent concentrations for metals generally seem to have increased, particularly in 2019, this was not true across all the pollutants of concern. For example, conventional pollutants’ concentration ranges were consistent with previous years, and concentrations for mercury and phenol decreased. Because no outliers were removed from the data set, all the 2019 data were included within the analysis.

Plots for influent flow rate and concentrations for conventional pollutants and metals are shown in **Appendix B**.

5. MAXIMUM ALLOWABLE HEADWORKS LOADINGS

This chapter presents the calculation of Maximum Allowable Headworks Loadings (MAHLs) for the pollutants of concern listed in **Table 3-3**. A MAHL is an estimate of the upper limit of pollutant loading to the WRF intended to prevent pass through or interference and meet all WRF requirements. The MAHL is calculated in three steps:

- Calculate WRF removal efficiency for each pollutant of concern.
- Calculate allowable headworks loadings (AHLs) for each environmental criterion. The major criteria considered here include plant capacity, effluent limitations, water quality criteria, biosolids disposal criteria, and treatment plant interference.
- Designate the most stringent AHL for each pollutant of concern as the MAHL.

5.1 Removal Efficiencies

For all constituents, the estimates of removal efficiency applied in the MAHL calculations were based on influent and effluent data. Influent and effluent data were used rather than influent and biosolids data because of the paired influent and effluent data available. The calculation of removal efficiency from the headworks to plant effluent uses the following equation:

$$\text{Removal Efficiency} = \frac{\text{(POTW Influent Conc. at Headworks) – (POTW Effluent Conc.)}}{\text{POTW Influent Concentration at Headworks}}$$

The removal efficiency was calculated using paired influent and effluent samples taken on the same day. Removal efficiencies were also calculated based on the mean and median concentrations for each constituent; the results are typically about the same as the median paired daily removal efficiency. The removal efficiency results are also shown in **Table 5-1** below. Only the removal efficiencies calculated using the median of daily pairs were used going forward.

Although no influent monitoring data were available for TDS, this constituent is not typically removed by Facility processes. As such, the influent concentration was assumed to be at the same level as the effluent concentration, and the removal efficiency was assumed to be 0%.

Table 5-1: Removal Efficiencies for Pollutants of Concern

Constituent	Influent Concentration (µg/L)		Effluent Concentration (µg/L)		Removal Efficiency[1]		
	Average	Maximum	Average	Maximum	Mean	Median	Median of Daily Pairs
Antimony	0.54	0.8	0.44	0.47	19%	14%	13%
Arsenic	1.2	1.8	0.64	0.83	47%	35%	29%
Cadmium	0.22	0.32	0.081	0.086	63%	60%	57%
Chromium	4	8.2	0.42	0.66	90%	83%	91%
Copper	168	220	12	16	93%	91%	91%
Lead	1.5	2.3	0.2	0.34	87%	88%	89%
Mercury	0.05	0.1	0.00026	0.00041	99%	100%	99%
Nickel	7.3	11	3.6	4	51%	43%	50%
Phenol	29	37	0.47	0.5	98%	98%	98%
Selenium	0.79	1.4	0.38	0.8	52%	49%	57%
Silver	0.3	0.5	0.08	0.2	73%	83%	85%
Zinc	156	230	78	110	50%	51%	51%
Constituent	**Influent Concentration (mg/L)**		**Effluent Concentration (mg/L)**		**Removal Efficiency**		
	Average	**Maximum**	**Average**	**Maximum**	**Mean**	**Median**	**Median of Daily Pairs**
TDS[2]	385	520	385	520	0%	0%	0%
BOD	213	740	4.89	24	98%	98%	98%
TSS	187	440	1.34	8	99%	99%	99%
Ammonia, as N	38	158	0.25	7.2	99%	100%	100%
Phosphorus	7.1	16	1.64	10.2	77%	88%	85%

Notes:

1. Removal efficiencies are rounded to the nearest percent. Values shown as 100% demonstrate removal efficiencies above 99.5% but not necessarily complete removal.
2. Only effluent monitoring data are available. Influent concentrations assumed to be the same as effluent, and thus, removal efficiencies are assumed to be 0%.

5.2 Allowable Headworks Loadings

This section contains calculations of allowable headworks loadings (AHLs) based on a variety of criteria such as design capacity for conventional pollutants, NPDES permit limits, biosolids land application limits, treatment plant interference, and other considerations. The lowest of these calculated AHLs is the MAHL for a given pollutant.

5.2.1 Facility Design Capacity for BOD, TSS, and Ammonia

The Town's recent Water Reclamation Facility Modernization Study (Hazen and Sawyer, 2019) provides information about the mass-based BOD, TSS, and ammonia treatment capacity of the WRF. The design capacity was based on the design hydraulic criteria of Parkson™ Biolac® aeration basins and combined average dry weather flow (ADWF) of 3.0 MGD through the two basins. Both aeration basins were used prior to 2016, but operation has since changed to utilize only one basin (1.5 MGD ADFW), due to several process control and available equipment factors. The WRF has been able to treat current loads to the Facility with only basin in operation (Modernization Study, 2019). The Facility design capacity from the Modernization Study for both one and two aeration basins in operation are summarized below in **Table 5-2**.

The Modernization Study concluded that the WRF has already reached its design loading capacity for TSS and ammonia. Despite this conclusion, the WRF has been consistently meeting NPDES permit limits for these constituents, because the operation of the WRF has been better than the design assumptions. It may be possible to increase the rated capacity of the WRF for TSS and ammonia loading via stress testing, additional process modeling, and capital improvements. The Town is currently in the process of planning improvements to the second aeration basin as well as the overall secondary treatment process. The Facility design capacity will be revisited as part of this effort, which is anticipated to be completed in 2023. For the purposes of this local limits evaluation, the analysis will consider a range of possible organic loading capacity values, rather than being limited to the values listed in the Modernization Study, in order to provide flexibility to the Town in setting limits irrespective of the outcome of the Facility design capacity analysis(see **Chapter 6**).

Table 5-2: Estimated WWTP Design Capacity for BOD, TSS, and Ammonia

Constituent	Estimated Design Capacity[1] (lb/day)	
	One Aeration Basin	Two Aeration Basins
BOD	3,250	6,500
TSS	1,750	3,500
Ammonia, as N	375	750

Notes:
1. Estimated design capacity is based on the design criteria in the 1994 and 1999 Parkson™ Design Documentation, as summarized in the Modernization Study. Actual Facility performance has been better than the design assumptions, even with one aeration basin in operation.

Local Limits Guidance recommends that the design capacities above be used as the MAHLs for these constituents. The section below includes AHLs estimated based on the Permit limits and actual removal efficiencies to confirm that design
capacities produce the more conservative AHLs. The estimated design capacity for the Facility with one aeration basin in operation is utilized in this assessment to reflect actual current operations and the more conservative analysis. Aside from these estimated design capacities, all other limits and AHLs summarized below are not dependent on the assumed number of aeration basins in operation.

5.2.2 NPDES Permit Limits and Water Quality Criteria

AHLs based on Permit effluent limits and water quality criteria were both calculated using Equation 5.5 from the Local Limits Guidance, as follows:

$$\mathbf{AHL} = \frac{(8.345) \cdot \text{(Permit Limit or Water Quality Criteria, mg/L)} \cdot \text{(POTW average flow rate, MGD)}}{\text{(1 - Removal Efficiency)}}$$

The NPDES Permit contains effluent limits for BOD, TSS, total nitrogen, and total phosphorus. The criterion for total nitrogen is conservatively listed as the criterion for ammonia in this analysis.

The Town's Facility discharges to Mark West Creek, a tributary to the Russian River), which supports the municipal and domestic supply beneficial use per the Water Quality Control Plan for the North Coast Region (Basin Plan). As such, EPA's National Drinking Water Regulations were considered, both primary and secondary MCLs.

For the Town's recycled water, primary and secondary MCLs in Title 22 of the California Code of Regulations, Section 64431 (Inorganic Chemicals), Section 64444 (Organic Chemicals), and Section 64439 (Secondary MCLs) were also

considered. The Geysers recharge project (operated by the City of Santa Rosa) also has separate standards for recharge; these were also considered for this analysis.

AHLs calculated using the methods described above are shown in **Table 5-3**.

Table 5-3: AHLs Based on NPDES Permit Limits and Water Quality Criteria

Constituent	Water Quality Criteria, RPA[1]	NPDES Permit[2]	Geysers Recharge Standards[3]	Federal, Primary MCL[4]	Federal, Secondary MCL[4]	Title 22, Primary MCL[5]	Title 22, Secondary MCL[6]	Lowest Criteria	Lowest AHL[7]
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	lb/day
Antimony	6	-	-	6	-	6	-	6	0.10
Arsenic	10	-	30	10	-	10	-	10	0.21
Cadmium	1.3	-	5	5	-	5	-	1	0.05
Chromium	11	-	100	100	-	50	-	11	1.8
Copper	16	-	200	1,300	1,000	-	1,000	16	2.6
Lead	1.1	-	50	-	-	-	-	1	0.15
Mercury	0.025	-	2	2	-	2	-	0	0.062
Nickel	26	-	200	-	-	100	-	26	0.78
Phenol	21,000	-	-	-	-	-	-	21,000	19,000
Selenium	5	-	50	50	-	50	-	5	0.18
Silver	1	-	-	-	100	-	100	1	0.10
Zinc	59	-	100	-	5,000	-	5,000	59	1.8
Constituent / Units	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**lb/day**
TDS	-	-	640	-	500	-	-	500	7,500
BOD	-	10	15	-	-	-	-	10	8,100
TSS	-	10	10	-	-	-	-	10	23,000
Ammonia, as N	1,700	10.5	25	10	-	10	-	10	61,000
Phosphorus	-	7.8	4	-	-	-	-	4	390

Notes:
1. Water Quality Criteria for Reasonable Potential Analysis (RPA) per Attachment F-1 in NPDES Permit, Order No. R1-2013-0042 and No. R1-2020-0010.
2. Water Quality-Based Effluent Limitations per Table 6 in NPDES Permit, Order No. R1-2020-0010. The criterion for total nitrogen is listed as the criterion for ammonia in this analysis.
3. Water Quality Standards per Exhibit 4 of Agreement to Convey Recycled Water by and Through Geysers Pipeline for Reuse, July 2007.
4. National Drinking Water Regulations, U.S. EPA, May 2009.
5. Primary Maximum Contaminant Levels for Inorganic Chemicals per 22 CCR § 64431.
6. Secondary Maximum Contaminant Levels for Inorganic Chemicals per 22 CCR § 64449.
7. AHL based on Eq. 5.5 in the Local Limits Guidance.

5.2.3 Land Application

AHLs based on land application were calculated using applicable limits for land application of biosolids from 40 CFR §503.13(b)(3) (*Standards for the Use or Disposal of Sewage Sludge, Land Application*). These criteria were converted to AHLs using Equation 5.9 from the Local Limits Guidance, as follows:

$$\mathbf{AHL} = \frac{(6.04\times10^{-6})\cdot(\text{Biosolids Pollutant Conc., mg/kg Dry Weight}) \cdot (\text{Dry Biosolids Avg. Production Rate, Tons/yr})}{(\text{Removal Efficiency})}$$

In the equation above, the Town's average dry biosolids production rate over the 2015-2019 period was 468 metric tons per year based on reported values from the annual reports of solids disposal. AHLs based on the land application criteria are shown below in **Table 5-4.**

Table 5-4: AHLs Based on Federal Biosolids Land Application Criteria

Constituent	Ceiling Concentration Limit	Monthly Average Concentration Limit	Most Stringent Limit	AHL
	mg/kg	mg/kg	mg/kg	lb/day
Antimony	-	-	-	N/A
Arsenic	75	41	41	0.40
Cadmium	85	39	39	0.19
Chromium	-	-	-	N/A
Copper	4,300	1,500	1,500	4.7
Lead	840	300	300	0.96
Mercury	57	17	17	0.048
Nickel	420	100	100	0.57
Phenol	-	-	-	N/A
Selenium	100	100	100	0.49
Silver	-	-	-	N/A
Zinc	7,500	2,800	2,800	15
Constituent / Units	**mg/kg**	**mg/kg**	**mg/kg**	**lb/day**
TDS	-	-	-	N/A
BOD	-	-	-	N/A
TSS	-	-	-	N/A
Ammonia, as N	-	-	-	N/A
Phosphorus	-	-	-	N/A

Notes:
1. Land Application Limits per Table 3 of CFR §503.13. AHLs are based on the Local Limits Guidance, Appendix T (formulas based on dry sludge production).

5.2.4 Treatment Plant Interference

Town staff have not observed inhibition of secondary treatment in the aeration basins nor of tertiary treatment with nitrification due to any pollutants of concern. Therefore, the AHLs for treatment plant interference are based on

literature values found in Appendix G of the Local Limits Guidance. Inhibition criteria for secondary and tertiary treatment were converted to AHLs using Equation 5.10 and Equation 5.11 in the Local Limits Guidance, as follows:

AHL = (8.345) · (Inhibition criterion, mg/L) · (POTW avg. flow rate, MGD)

To be conservative, no adjustment was made for removal in neither the primary nor secondary treatment system. Removal efficiencies from headworks to primary and secondary treatment effluent were assumed to be zero, making Equation 5.10 and Equation 5.11 both equivalent to the above. AHLs for treatment plant interference calculated according to the method described above are shown below in **Table 5-5**.

Table 5-5: AHLs Based on Treatment Plant Interference

Constituent	Literature Value for Activated Sludge Inhibition[1]	Literature Value for Nitrification Inhibition[2]	Most Stringent Literature Value	AHL
	µg/L	µg/L	µg/L	lb/day
Antimony	-	-	N/A	N/A
Arsenic	100	1,500	100	1.5
Cadmium	1,000	5,200	1,000	15
Chromium	1,000	250	250	3.8
Copper	1,000	50	50	0.75
Lead	1,000	500	500	7.5
Mercury	100	-	100	1.5
Nickel	1,000	250	250	3.8
Phenol	50,000	4,000	4,000	60
Selenium	-	-	N/A	N/A
Silver	-	-	N/A	N/A
Zinc	300	80	80	1.2
Constituent / Units	**mg/L**	**mg/L**	**mg/L**	**lb/day**
TDS	-	-	N/A	N/A
BOD	-	-	N/A	N/A
TSS	-	-	N/A	N/A
Ammonia, as N	480	-	480	7,200
Phosphorus	-	-	N/A	N/A

Notes:
1. Activated Sludge Inhibition per Appendix G of the Local Limits Guidance. AHLs are based on Eq. 5.10 in the Local Limits Guidance. Calculations conservatively assume 0% removal efficiency from headworks through primary treatment.
2. Nitrification Inhibition Criteria per Appendix G of the Local Limits Guidance. AHLs are based on Eq. 5.11 in the Local Limits Guidance. Calculations conservatively assume 0% removal efficiency from headworks through secondary treatment.

5.2.5 Explosivity and Fume Toxicity

None of the pollutants of concern had identified discharge screening levels for explosivity or fume toxicity, as listed in Appendix I to the Local Limits Guidance.

5.2.6 Comparison of MAHLs to Actual Influent Loadings

BOD, TSS, and Ammonia

The MAHLs for BOD, TSS, and ammonia are based on the rated design capacity of the Facility. These are compared to actual average and peak month influent loadings in **Table 5-6**.

Table 5-6: Maximum Allowable and Actual Influent Loadings for BOD, TSS, and Ammonia

Constituent	MAHL[1]	Avg Daily Influent Loading	Peak Month Influent Loading	Avg Influent Loading / MAHL
	lb/day	lb/day	lb/day	%
BOD	3,250	2,920	4,518	90%
TSS	1,750	2,550	3,283	146%
Ammonia, as N	375	516	904	138%

Notes:
1. Design capacity based on one aeration basin in operation.

A revision to local limits is generally considered when the monthly influent loading reaches 80% of the design capacity, whether on an average annual or peak monthly basis. As **Table 5-6** indicates, actual BOD, TSS, and ammonia loadings currently exceed 80% of the listed design capacity. As explained in **Section 5.2.1**, the WRF has been consistently meeting NPDES permit limits for these constituents, because the operation of the WRF has been better than the design assumptions. The design capacity values are being re-evaluated with the aeration basin improvement projects. For the purposes of this local limits evaluation, the analysis will consider a range of possible organic loading capacity values, rather than being limited to the values listed in the Modernization Study (See **Chapter 6**).

Priority Pollutants, TDS, and Phosphorus

The lowest of the AHLs listed above were used to establish the MAHLs for priority pollutants and total phosphorus, as shown in **Table 5-7**.

Table 5-7: Comparison of AHLs Used to Determine the MAHL

Constituent	NPDES Permit/Water Quality Criteria AHL	Biosolids Land Application Criteria AHL	Treatment Plant Interference AHL	MAHL
	lb/day	lb/day	lb/day	lb/day
Antimony	0.10	N/A	N/A	0.10
Arsenic	0.21	0.40	1.5	0.21
Cadmium	0.05	0.19	15	0.045
Chromium	1.8	N/A	3.8	1.8
Copper	2.6	4.7	0.75	0.75
Lead	0.15	0.96	7.5	0.15
Mercury	0.062	0.048	1.5	0.048
Nickel	0.78	0.57	3.8	0.57
Phenol	19,000	N/A	60	60
Selenium	0.18	0.49	N/A	0.18
Silver	0.10	N/A	N/A	0.10

Constituent	NPDES Permit/Water Quality Criteria AHL	Biosolids Land Application Criteria AHL	Treatment Plant Interference AHL	MAHL
	lb/day	lb/day	lb/day	lb/day
Zinc	1.8	15	1.2	1.2
TDS	7,500	N/A	N/A	7,500
Phosphorus	390	N/A	N/A	390

The MAHL for each pollutant of concern is compared to actual average and maximum influent loadings in **Table 5-8**.

Table 5-8: Comparison of Maximum Allowable and Actual Influent Loading for Priority Pollutants, TDS, and Phosphorus

Constituent	MAHL	Average Influent Loading	Maximum Influent Loading	Average Influent Loading as a Percent of MAHL	Maximum Influent Loading as a Percent of MAHL	Need to Re-evaluate?
	lb/day	lb/day	lb/day			
Antimony	0.10	0.0081	0.012	8%	12%	No
Arsenic	0.21	0.018	0.027	9%	13%	No
Cadmium	0.045	0.0033	0.0048	7%	11%	No
Chromium	1.8	0.060	0.12	3%	7%	No
Copper	0.75	2.5	3.3	336%	440%	Yes
Lead	0.15	0.023	0.035	15%	24%	No
Mercury	0.048	0.00075	0.0015	2%	3%	No
Nickel	0.57	0.11	0.17	19%	29%	No
Phenol	60	0.44	0.56	1%	1%	No
Selenium	0.18	0.012	0.021	7%	12%	No
Silver	0.10	0.0045	0.0075	4%	7%	No
Zinc	1.2	2.3	3.5	195%	288%	Yes
TDS	7,500	5,800	7,800	77%	104%	Yes
Phosphorus	390	95	133	25%	34%	No

The threshold used to determine whether local limits should be revised is generally when the average influent loading exceeds 60% of the MAHL or when maximum influent loading exceeds 80% of the MAHL. The pollutants that exceeded this threshold are copper, zinc, and TDS.

The basis for the MAHL for both copper and zinc is the literature value for Facility nitrification inhibition from the Local Limits Guidance, although the Town has not previously observed any inhibition in the nitrification process. The second lowest AHLs for these constituents are based on water quality criteria, which also would have triggered re-evaluation for these constituents. As discussed further below, the Facility has not had violations associated with these constituents, although biosolids concentrations approaching compliance limits have been observed. As such, copper and zinc concentrations, and if their respective local limits warrant revision, should be further investigated in order to prevent any future Facility operational or compliance issues.

The basis for the MAHL for TDS is the national drinking water regulations, which the Town is subject to since its discharge to receiving waters supports the municipal and domestic supply beneficial use. The second lowest AHL for TDS is based on the Geysers recharge standards, which also would have triggered re-evaluation. The Town has not experienced issues of compliance with the water quality thresholds, but TDS should be further investigated to prevent any future compliance issues with receiving water or recycled water quality.

Neither the average nor maximum loading of phosphorus exceeded its respective MAHL threshold triggering evaluation of a local limit for phosphorus given the effluent limit included in the analysis. Although there is currently no existing local limit, the Town is interested in establishing a phosphorus loading limit to address its "zero" net loading requirement effective October 2022. The new local limit for phosphorus is developed in the following sections with the revisions of the other conventional pollutants: BOD, TSS, and ammonia.

Copper

The average and maximum influent load for copper exceed 80% of the MAHL. According to the Local Limits Guidance, this could theoretically trigger a need to revise the local limit. However, there is currently limited sampling data, and none of it suggests that the source of the high copper loads is from industrial users. The Town should include copper in its monitoring of industrial sources to further investigate if a revision to the copper local limit is needed.

According to distribution system sampling in the summer of 2019, the source of copper loading may be due to copper corrosion in the drinking water supply. The 90th percentile copper concentration of over 30 samples across the distribution system was 992 µg/L. This is significantly higher compared to the 90th percentile detected copper concentration of 105 µg/L from the City of Santa Rosa's water sampling data. The City of Santa Rosa's water demand is served primarily by the Sonoma County Water Agency (SCWA), and it was able to address previous copper corrosion within its system by coordinating with SCWA to adjust the pH of the water supply. A small portion of the Town of Windsor's service area is also served by SCWA water supply, while the rest primarily utilizes groundwater wells located adjacent to the Russian River. The Town should conduct water and/or wastewater sampling to determine if there are differences in copper concentrations and pH levels between the different water sources, in order to confirm if copper corrosion control would be effective in reducing the source of copper to the Facility.

Additional consideration for seasonality in the sampling and as it related to the water quality criteria is also discussed in detail in the zinc section below.

Zinc

The average and maximum influent load for zinc exceeds 80% of the MAHL. According to the Local Limits Guidance, this could theoretically trigger a need to revise the local limit. However, there is currently limited sampling data, and none of it suggests that the source of the high zinc loads is from industrial users. Similar to the copper discussion, the Town should include zinc in its collection system monitoring to further investigate if a revision to the zinc local limit is needed.

Although both zinc and copper were flagged for re-evaluation of local limits, neither constituents triggered reasonable potential to cause or contribute to exceedances of applicable water quality criteria within the Permit (Order No. R1-2020-0010). This is because the reasonable potential analysis was evaluated based on EFF-002 monitoring location data, collected during the time when the Town is discharging to receiving waters. As explained in **Section 3.3**, the local limits analysis is conservative in that it utilizes effluent data from the REC-003A monitoring location instead, capturing all Facility effluent water quality regardless of if the effluent is discharged to Mark West Creek or recycled for geysers discharge or irrigation. The difference in the effluent water quality may potentially be attributable to variation due to seasonality, as EFF-002 sampling was conducted during the discharge season (November 1 through

April 30), while REC-003A monitoring and influent monitoring at INF-001 was conducted annually during the discharge prohibition season in either July or August the last few years. The recently reissued permit Order No. R1-2020-0010 now requires that priority pollutant sampling for influent, effluent, and receiving water monitoring is conducted concurrently annually during the discharge season. This updated sampling schedule can help confirm whether the higher copper and zinc concentrations observed in REC-003A effluent may have been due to seasonality in the influent concentrations, when compared against historical influent data. The Town may also consider sampling for priority pollutants, particularly for copper and zinc, both during and outside of the discharge prohibition season annually for comparison within the same year. Note that in accordance with the Permit, any additional sampling in excess of the permit's monitoring requirements shall be reported to the Regional Water Board to be considered for compliance.

TDS

The average influent load and maximum influent load for TDS exceed 60% and 80% of the MAHL, respectively. According to the Local Limits Guidance, this could theoretically trigger a need to revise the local limit. However, there is currently limited sampling data to confirm the source of the TDS. Similar to the copper and zinc discussions, the Town should include TDS in its monitoring of industrial sources and within its collection system to further investigate if a revision to the TDS local limit is needed. A re-evaluation of the limit would help the Town ensure that the local limit continues to be sufficiently protective of receiving water and recycled water quality.

6. REVISIONS TO LOCAL LIMITS

6.1 Local Limits for Toxic Pollutants

As a result of this local limits assessment, the Town has concluded that some local limits for toxic pollutants may potentially require revisions, pending additional sampling and investigation.

6.1.1 Local Limits to Remain the Same

Based on the MAHL analysis, the following constituents' local limits do not require revision:

- Antimony
- Arsenic
- Cadmium
- Chromium
- Lead
- Mercury
- Nickel
- Phenol
- Selenium
- Silver

Constituents with existing local limits but no current data available could not be evaluated within this local limits assessment. Some of these constituents are recommended for additional sampling, as discussed in **Section 6.1.2**. The following constituents were not evaluated and no Facility issues have been observed related to these constituents, but their local limits shall remain the same to continue to protect the Facility (including from occasional groundwater discharges), receiving water quality, and recycled water uses:

- Boron
- Total chlorinated hydrocarbons
- Total oil and grease (non-floatable grease, oil, fat, ether-soluble matter other than soap)
- Total petroleum hydrocarbons (floatable grease, oil, fat, ether-soluble matter)
- Total toxic organics (TTOs)

There is precedence for POTWs for removing local limits for TTOs, particularly in the cases where local limits for other constituents targeting groundwater remediation projects (e.g., total petroleum hydrocarbon) are already available. Because the Town does not have the same safeguards, the Town should retain the local limit for additional protection.

6.1.2 Local Limits Pending Additional Sampling

Copper, Zinc, and TDS

Additional sampling should be conducted, as described in the **Section 5.2.6**, to confirm if adjusting copper, zinc, and/or TDS local limits for industrial users would effectively protect the Facility, its operations, and compliance. No local limits changes are planned at the current time because the source of these constituents is believed to be primarily from the water supply and domestic water use, not from commercial and/or industrial discharge.

Other Local Limits

Besides those constituents under **Section 6.1.1** for which local limits are proposed to remain the same, there are additional constituents with existing local limits but limited data available for evaluation within this local limits analysis. This includes cyanide, for which no influent sampling data was available within the evaluation date range because influent monitoring was not required after an undetected scan in the first year of the 2013 Permit. Because there is an effluent limit for cyanide within the current 2020 NPDES permit, the Town should consider prioritizing collecting additional cyanide sampling and data (together with copper, zinc, and TDS) to ensure that the existing local limit is adequate. For the remaining constituents with local limits but limited data, the Town should also collect additional sampling data to confirm adequate protection of the Facility, receiving water quality, and recycled water uses. These latter constituents may be re-evaluated after the completion of the basin improvement projects, unless Facility conditions determine that reassessment is necessary sooner. To characterize the baseline conditions for these constituents and determine if the local limits are necessary for protection of the Facility and receiving waters in the future, the Town is planning to conduct sampling additional to the monitoring requirements within the NPDES Permit. At least annual sampling is recommended, consistent with the sampling frequency for the other constituents assessed within this evaluation. **Table 6-1** lists constituents with existing local limits where additional sampling is proposed, as well as the initial results from 2020 sampling from a single sampling event on August 5, 2020.

Although none of the effluent results exceed the lowest applicable criterion, there are several constituents for which the influent sampling concentrations exceed half of the lowest applicable criteria in the screening: cyanide, aluminum, iron, and manganese. However, it is not reasonable to evaluate these constituents, or any constituents, based on a single sample result. Therefore, additional sampling should occur to continue to characterize the concentrations and obtain additional data necessary for a quantitative assessment of the local limits.

Table 6-1: 2020 Additional Sampling Results

Constituent	Existing Local Limit	Lowest Applicable Criteria		August 5, 2020	
				Influent (INF-001)	Effluent (REC-003A)
	mg/L	Value, µg/L	Basis	µg/L	µg/L
Cyanide (total)[1]	0.2	4.3	NPDES Effluent Limit, average monthly	3	4
Beryllium[1]	1	4	Primary MCL	ND	ND
Aluminum	5	200	Secondary MCL	1,200	99
Barium	5	1,000	Primary MCL	110	25
Cobalt	0.5	80,000	CA Hazardous Waste Limit (STLC)	0.72	0.28
Fluorides	2	2,000	Primary MCL	ND	150
Formaldehydes	5	-	*Unknown - Likely related to worker exposure and effluent toxicity*	N/A	N/A
Iron	5	300	Secondary MCL	520	110
Manganese	1	50	Secondary MCL	93	2.8

Notes:

1. Effluent sampling of cyanide and beryllium are already included as part of the NPDES monitoring requirements, but not influent sampling.

6.2 Local Limits for Conventional Pollutants

The Town currently has uniform concentration-based limits for BOD, TSS, and ammonia, applicable to SIUs. The Town also charges BOD and TSS strength-based wastewater capacity fees for new users, one-time fees charged for new service connections to the Town's wastewater collection, treatment, and disposal system. The wastewater capacity fee is determined based on the number of equivalent single-family dwellings (ESDs) and the wastewater strength. The current wastewater capacity fee (WWCF) for new connections for non-standard waste characteristics is determined by the following equation listed in the Town's *Development Impact Fee Adjustment Effective July 1, 2020:*

WWCF = $9,932 per ESD, where

ESD = (Flow, gpd) / 200 x [0.83 + (0.12 x (BOD conc., mg/L) / 200) + (0.05 x (TSS conc., mg/L) / 175)]

The Town's current local limits for these constituents are listed in **Appendix A** and are also excerpted below in **Table 6-2**. The Town believes that the current local limits may be too high for these parameters for effective control and protection of the Facility and would like to consider a reduction of the local limits, alternative control options, or both. The rationale for these local limits is unknown and appears to not be technically based but may potentially have referenced the neighboring City of Santa Rosa's local limits at the time that they were established. The City of Santa Rosa has since re-evaluated its local limits in 2019, removed its local limits for these constituents, and is implementing high-strength surcharges instead.

Table 6-2: Summary of Current Local Limits for Conventional Pollutants

Constituent	Local Limit, mg/L
Biochemical Oxygen Demand (BOD)	20,000
Total Suspended Solids (TSS)	10,000
Total Kjeldahl Nitrogen (TKN) (as Ammonia)	2,600
Total Phosphorus	No Limit

As the MAHL analysis in **Section 5.2.6** concluded a revision to the existing local limits should be considered for BOD, TSS, and ammonia because the monthly influent loading reaches 80% of the Facility design capacity. In the actual operation of the Facility, the performance has been better than the design assumptions based on the Town's experience. In the interim period before the Facility's improvements are completed and its capacity is re-rated, the local limits should be re-evaluated and implemented to ensure that they are sufficiently protective of the Facility and its operations going forward.

Although there is no existing local limit for total phosphorus, the Town would like to also implement a new local limit for phosphorus in anticipation for its "zero" net loading requirement effective October 2022 and the associated effluent limitations as described within its NPDES Permit.

6.2.1 Local Limits and Control Options Workshop

In August 2020, Woodard & Curran facilitated a workshop with the Town to evaluate alternatives for policies that would assist the Town in managing industrial loading of BOD, TSS, ammonia, and phosphorus. The discussion included modifications to the existing local limits, other control options, or a combination of approaches. Control options considered during this workshop included:

- strength-based charges,
- tiered charges based on industry type and water usage,
- individual mass-based limits,

- tiered concentration-based limits based on industry type or size, or
- a hybrid approach.

The discussion compared the above alternatives, centered around the following criteria:

- **Level of Control:** The effectiveness of the alternative in allowing the Town to control industrial loading of these constituents.

  The Town's concern with the existing local limits is in their effectiveness in controlling influent loads given the limited Facility capacity available at this time. A charge approach does not provide the Town substantial flexibility in controlling the industrial loading. Aside from the financial disincentive, an industrial user would essentially be permitted to discharge as much loading as it is willing to pay for. As such, the Town has elected to control these constituents through a limits approach.

- **Administrative Effort:** The responsibilities associated with the alternative, e.g., monitoring, enforcement, and record keeping.

  The Town would like to implement the limits in the form of mass-based limits, as staff operate the plant and observe capacity on a loading basis. The monitoring and enforcement required would be similar to what the Town is currently conducting for existing dischargers in its periodic sampling and monitoring as described in Municipal Code Section 12-4-410. Wastewater sampling frequency would vary depending on the discharger. For dischargers such as wineries, the critical period is during "crush" or "vintage" season in autumn, so short-term monitoring and enforcement would be implemented during the period of highest wastewater flow and constituent discharges. For dischargers with ongoing operations, such as for breweries, more frequent and continuous monitoring and enforcement would be implemented throughout the year.

- **Fairness:** The fairness of the alternative's structure to different industrial users and to existing industrial users.

  The Town's current local limits are uniform for any discharger categorized as an SIU. With a new proposed flow-tiered structure, the local limits are weighted based on the size of the discharger. Existing industrial dischargers are not currently subject to local limits and would not be retroactively subject to the local limits. However, they will be held accountable to their purchased capacities at the time of connection, as discussed further in **Section 6.2.4**. As detailed in the Municipal Code, the General Manager may apply some or all of the local limits to new industrial users as the General Manager deems appropriate and designates in the users' Wastewater Discharge Permit.

- **Economic Efficiency**: The ability of the alternative to encourage business development and/or allow the Town to use its capacity in an efficient way.

  Implementing more protective local limits allows for industrial growth in a controlled manner, while providing the Town the flexibility and discretion to permit industrial users on a case-by-case basis as requests are made.

6.2.2 Consideration of Facility Capacity

The Modernization Study and MAHL analyses conclude that the Facility is currently loaded above the assumed design capacity documented in the 1994 and 1999 Parkson™ Design Documentation. However, the WRF has been consistently meeting NPDES permit limits and operating better than the design assumptions would indicate. The design capacity values are being re-evaluated with the aeration basin improvement projects, which is not available for this local limits evaluation. As such, for the purposes of the local limits evaluation, the analysis will quantify the allocated

capacity and possible loading capacity values, in the context of how proposed local limits modifications would fit within the assumed capacity reserve.

The assessment of the WRF capacity in the following sections is consistent with the process within the internal *Lytton Development Water Reclamation Facility Capacity Assessment* technical memo that was prepared by the Town earlier this year (Town of Windsor, 2020).

6.2.2.1 Allocated Facility Capacity

The Facility's allocated capacity includes its current load and loads from anticipated developments. **Table 6-3** summarizes the current load at the Facility for BOD, TSS, ammonia, and total phosphorus. The current load is conservatively presented as average peak 30-day loads based on flow and concentration data within the previous five years. Concentration data from 2015 through 2019 were considered for consistency with the local limits MAHL calculations. Average concentrations from the last couple of years (2018-2019) are comparable to the concentrations in 2015-2017 summarized within the Modernization Study, although peaking factors (PFs) have increased.

Table 6-3: Current Loading to the Water Reclamation Facility

Constituent	Average Conc (mg/L)[1]	Max 30-day Conc PF[1]	Average Peak 30-day Conc (mg/L)	ADWF (MGD)[2]	Current Peak 30-day Load (lb/day)
BOD	213	1.47	313	1.32	3,440
TSS	187	1.42	266	1.32	2,930
Ammonia, as N	38	1.50	57	1.32	626
Phosphorus	7.1	1.40	10	1.32	109

Notes:
1. Based on 2015-2019 concentration data
2. 2018-2019 ADWF from *Lytton Development Water Reclamation Facility Capacity Assessment* (Town of Windsor, 2020)

In addition to the current loads, the Town has also projected loads from anticipated developments within its service area. Between now and 2023, when the Facility's aeration basin improvements project is expected to be complete and additional capacity is anticipated to be available, the Town identified approximately 472 ESDs of new residential and commercial developments planned. **Table 6-4** projects the anticipated loads from these new developments based on current loading, which estimates approximately an 8% increase in loading from 2019 to 2023.

Table 6-4: Anticipated Loading from New Developments

Constituent	ADWF per ESD (gal/day)[1]	Estimated Conc per ESD (mg/L)[2]	Load per ESD (lb/day)	Anticipated Load (lb/day)[3]
BOD	225	313	0.59	277
TSS	225	266	0.50	236
Ammonia, as N	225	57	0.11	51
Phosphorus	225	10	0.02	9

Notes:
1. Applied residential unit rate based on 2020 Collection System Master Plan prepared by GHD, as listed in the *Lytton Development Water Reclamation Facility Capacity Assessment* (Town of Windsor, 2020)
2. Average peak 30-day concentration, based on 2015-2019 concentration
3. Assumes 472 ESDs of anticipated developments (Town of Windsor, 2020)

6.2.2.2 Assumed Facility Capacity and Reserve

Table 6-5 summarizes a range of possible capacity values for these conventional pollutants at the Facility with one aeration basin in operation. Based on current operations, the Facility is able to operate above the design capacity assumptions, at least at the level of current loads, and is anticipated to be able to manage the total projected loading through 2023.

Table 6-5: Comparison of Facility Capacity and 2023 Projections

Constituent	Design Capacity (lb/day)	Current Peak 30-day Load (lb/day)[1]	Projected 2023 Load (lb/day)[2]
BOD	3,250	3,440	3,720
TSS	1,750	2,930	3,160
Ammonia, as N	375	626	677
Phosphorus	N/A	109	118

Notes:
1. Based on 2015-2019 average peak 30-day concentration and 2018-2019 ADWF
2. Includes anticipated developments in addition to current peak 30-day load through 2023

6.2.3 Proposed Local Limits

Through the workshop discussions, the Town concluded that it would like to reduce the current local limits for conventional pollutants and convert them to mass-based limits in a flow-tiered structure. Although the limits themselves will be mass-based, the development of these proposed local limits takes into consideration the flows and concentrations contributing to the load.

6.2.3.1 Tiered Local Limits Structure

Three tiers of limits are proposed for consistency with strength-based control structures already available. The tiered approach appropriately controls loads, accounting for different-sized dischargers. Dischargers would be classified by average annual flow rate into one of three flow tiers: less than 1,500 gallons per day (gpd), 1,500 to 25,000 gpd, and greater than 25,000 gpd. Dischargers with flows greater than 25,000 gpd are automatically classified as Significant Industrial Users (SIUs), as defined in 40 CFR 403.3 (EPA, 2004).

The 1,500 gpd threshold for Tier I is set to be inclusive of all "small" wineries, which make up the majority of the Town's existing industrial user base and is anticipated to be the majority of future industrial discharge requests as well. A "small" winery is defined by Brelje & Race in the *Small Winery Classification and Investigation Regarding Wastewater Capacity Fees* report as a winery that produces less than 25,000 gallons of wine per year. For an estimated 20.18 gallons of wastewater generated per case of wine produced, this translates to approximately 1,400 gallons per day of wastewater generated on average (Brelje & Race, 2014).

6.2.3.1.1 BOD and TSS

Industrial users with the highest discharge flow rates, and the technical and economic wherewithal to pretreat those discharges, will have lower limits. This approach is intended to prevent any significant mass loading that could adversely impact the Facility. The Town currently classifies non-residential customers into user groups in its wastewater billing structure based on wastewater strength characteristics of BOD and TSS. The 2020 Rate Study update notes that the category distinctions were developed based on consultant recommendations and guidelines published by the California State Water Resources Control Board in 2004 (The Reed Group, 2020).

Consequently, Tier I (lowest flow) customers' limits are to be aligned with the high strength category, and Tier II customers' limits are aligned with the medium strength category. Because the low strength category was based on dated residential wastewater strength, the low strength category has been updated with the 2015-2019 data analysis to reflect more recent average influent BOD and TSS concentrations in the development of the respective Tier III local limits. At all tiers within the proposed structure, the concentrations assumed for development of the revised mass-based local limits are significantly lower than the current uniform local limits concentrations: 20,000 mg/L for BOD and 10,000 mg/L for TSS.

The wastewater billing strength categories, particularly for BOD, are less than the concentration expected from potential industrial users. For example, wineries' raw wastewater typically average over 1,400 mg/L of BOD (Brelje & Race, 2014). For a new discharger to comply with mass-based local limits calculated from the assumed concentrations described above, pretreatment technology may need to be installed. The Town understands that this may be a significant economic burden, especially for smaller businesses, which would also conflict with the Town's desire to accommodate industrial employment growth. For that reason, the proposed local limits revisions will also include a footnote allowing the Town the discretion to permit exceptions to the local limits at the Tier I level, where a discharger may, instead of complying with the BOD local limit, pay the wastewater usage rate for its total BOD load as identified in the Town's recently adopted wastewater user rates and connection fees. For new industrial users, this is the only except to enforcement of local limits, where the wastewater rates under "WW Usage Rate Components for Special Situations" section would apply in lieu of compliance with the local limit. Note that more frequent sampling for such users would need to be conducted, at least at a monthly frequency in order to determine monthly billings. Given the relatively minor hypothetical impact on WRF influent loading (less than 0.5% of influent average loading for Tier I users, as documented in **Table 6-6** below), such allowances would not adversely impact the Town's ability to treat its overall incoming wastewater influent flow and loading. Accepting surcharge fees for additional loads above the local limits for new users in other cases, however, are not recommended until the capacity improvement projects are complete. Details of how the local limits are enforced are described within Article 4, the Wastewater Treatment section of the Municipal Code.

The mass-based local limits are developed as a product of an assumed flow for each of the tiers and the associated strength for the category. Because the majority of the Town's users are expected to fall within Tier I, the upper flow threshold of 1,500 gpd was assumed for developing the Tier I local limits. Tier III limits assumed the SIU threshold flow of 25,000 gpd, and Tier II limits assumed the midpoint between these two flows. A summary of the development of the BOD and TSS local limits is shown in **Table 6-6**. The mass-based BOD and TSS local limits would range from approximately 0.3% of the current influent loads for Tier I dischargers, up to 1.55% for Tier III dischargers.

Table 6-6: Development of BOD And TSS Local Limits

Tier	Assumed Flow	BOD			TSS		
	gpd	mg/L	lb/day	% of Current INF Average Loading	mg/L	lb/day	% of Current INF Average Loading
Tier I [1] < 1,500 gpd	1,500	800	**10 [4]**	0.34%	600	**7.5**	0.29%
Tier II [2] 1,500– 25,000 gpd	13,250	300	**33**	1.14%	240	**27**	1.04%
Tier III [3] > 25,000 gpd	25,000	210	**44**	1.50%	190	**40**	1.55%

Notes:
1. Concentrations based on high wastewater strength categories, as defined in the Town's wastewater billing system
2. Concentrations based on medium wastewater strength categories, as defined in the Town's wastewater billing system
3. Concentrations based on 2015-2019 average influent concentration
4. The Town reserves the discretion to permit exceptions to the Tier I BOD local limit where a discharger may pay a fee for its total discharge load in lieu of compliance with the local limit. The applicable rate is identified in the "WW Usage Rate Components for Special Situations" section of the Town's wastewater rates.

6.2.3.1.2 Ammonia and Phosphorus

There are currently no wastewater strength characteristics defined for ammonia and phosphorus within the Town's wastewater billing system. Similar to BOD and TSS, the assumed concentrations for the development of the Tier III local limits were based on the respective 2015-2019 average influent concentrations. The assumed concentrations at the Tier I and Tier II level were increased based on the ratio of the assumed concentrations compared to Tier III in the BOD local limit structure for consistency: a 210/300 ratio from Tier III to Tier II (approximately a 50% increase) and a ratio of 210/800 from Tier III to Tier I (approximately 400% increase).

The Tier III ammonia concentration of 38 mg/L as N is reasonable as compared to the maximum daily effluent limits (MDELs) presented in the permits of nearby POTWs and is significantly lower than the current local limit of 2,600 mg/L. The new local limits for phosphorus will help the Town with its no net loading requirement by controlling excessive phosphorus loads, as supplemented by additional narrative best management practices (BMP) source control approach. A summary of the development of the ammonia and phosphorus local limits is shown in **Table 6-7**. The mass-based ammonia and phosphorus local limits would remain below 1.55% of the current influent loads for both constituents, similar to the structure for BOD and TSS.

Table 6-7: Development of Ammonia and Phosphorus Local Limits

Tier	Assumed Flow	Ammonia, as N			Phosphorus		
	gpd	mg/L	lb/day	% of Current Average INF Loading	mg/L	lb/day	% of Current Average INF Loading
Tier I < 1,500 gpd	1,500	145	**1.8**	0.35%	27	**0.34**	0.35%
Tier II 1,500– 25,000 gpd	13,250	54	**6.0**	1.16%	10	**1.1**	1.17%
Tier III > 25,000 gpd	25,000	38	**7.9**	1.54%	7.1	**1.5**	1.55%

The proposed revisions for mass-based local limits for conventional pollutants are summarized in **Table 6-8**. These limits are 1. technically based, and 2. adequately protective of the Facility and its effluent water quality, compared to the previous limits for the following reasons:

- The proposed local limits for BOD, TSS, and ammonia are developed based on significantly reduced concentrations compared to the existing local limits and are consequently more stringent. At the existing limits, a single new industrial user could easily double the loading and potentially overload the Facility.
- Although the actual capacity of the Facility requires redefining, these local limits would control and cap the loading of conventional pollutants to the Facility in the interim period until 2023, when additional capacity is anticipated to be available.
    - The local limits do not allow any single user to discharge loads above 1.55% of the current Facility's average influent loadings.
    - The structure of the local limits allows for industrial growth, where a large Tier III user or a number of lower-flow users, together with the anticipated new developments, would not exceed a 10% increase in loading from the Facility's current average influent loading.

Table 6-8: Summary of Proposed Numeric Local Limits for Conventional Pollutants

Tier	BOD (lb/day)	TSS (lb/day)	Ammonia, as N (lb/day)	Phosphorus (lb/day)
Tier I < 1,500 gpd	10	7.5	1.8	0.34
Tier II 1,500– 25,000 gpd	33	27	6.0	1.1
Tier III > 25,000 gpd	44	40	7.9	1.5

6.2.4 Existing Dischargers

The local limits revisions will not impact any existing industrial users, as none are currently classified as SIUs subject to the local limits and the Town does not intend to apply local limits retroactively. However, changes in ownership of a property will reopen the discussion of purchased capacities and local limits applicability. Existing industrial users purchased ESDs through capacity fees at the time of connection. The basis for the capacity fees and the ESD purchases have varied throughout the years for the dischargers. The most current wastewater capacity fees are described in **Section 6.2**.

While the existing dischargers are not subject to local limits, it is necessary to continue ensuring that their loads do not increase significantly from their historical conditions and/or their purchased capacities. Therefore, in conjunction with the proposed local limits revisions for new dischargers, the Town should regularly monitor existing dischargers and re-evaluate their purchased capacities, for example, when a certain threshold is exceeded. This threshold would act as a trigger for one or a combination of actions taken to rectify the exceedance of the purchased capacity. The Town may consider actions including but not limited to:

- Determination of additional fees or surcharges
- Requirement for reduced wastewater flows and pollutant loadings discharge, e.g., through BMPs or through installation of additional pretreatment facilities
- Reclassification of the discharger's purchased capacity and/or status as an SIU

6.3 Summary of Planned Changes

The Town currently receives discharge from a small number of industrial dischargers, but no users are classified as SIUs nor have been deemed necessary to be subject to local limits. However, the lack of a substantive control mechanism for conventional pollutants creates the potential for loading to the Facility to significantly increase, especially with the addition of planned developments and potential new industrial users. This is especially critical to address as the Facility is already operating at or above the Facility design capacity assumptions for BOD, TSS, and ammonia. The Facility has been performing above the assumed design capacities, but additional capacity and re-rating of the Facility is not expected until 2023 with the completion of the basin improvement project. Therefore, it is critical that the Town modifies its local limits for these pollutants to be adequately protective of its Facility and its discharge requirements in the interim period. In the future, if significant capacity is available, the Town may elect to remove local limits for conventional pollutants, modifying Municipal Code to simply utilize the wastewater usage rates for special situations already defined within its wastewater billing system.

Copper, zinc, and TDS were flagged in the analysis, but additional investigation and sampling should be conducted to confirm that the loading should be controlled via industrial users and not through other sources. Although the cyanide local limit was not assessed within this evaluation due to limited data available, it should also be investigated and

sampled further to determine if the local limit needs to be revised to be sufficiently protective, particularly in light of the new cyanide effluent limits that were established within the Town's current R1-2020-0010 NPDES Permit. Furthermore, some constituents with local limits (beryllium, aluminum, barium, cobalt, fluorides, formaldehydes, iron, and manganese) will be re-evaluated after additional sampling is conducted to obtain adequate data to confirm sufficient protection of the Facility, receiving waters, and recycled water uses.

Because the Town's pretreatment program is not pursuant to the requirements of 40 CFR Part 403, changes to its local limits are not subject to review and/or approval by the Regional Water Quality Control Board or USEPA. As detailed in the Municipal Code, the General Manager may apply some or all of the local limits to new industrial users, including changes in ownership for existing users, as the General Manager deems appropriate and designates in the users' Wastewater Discharge Permit. The proposed revisions to local limits will not impact any existing industrial users, as none are currently classified as SIUs nor have been deemed necessary to be subject to the local limits, and the Town does not intend to apply local limits retroactively. This will be made clear in the update to the Municipal Code, along with other changes described in this report related to the local limits revisions. However, with the implementation of modified local limits for industrial users going forward, the Town should continue to monitor existing dischargers and determine if purchased capacities are still applicable. The Town should reach out to existing users to ensure that this grandfathering process and communication are clear during the implementation of these proposed local limits revisions within its Municipal Code.

A summary of the proposed revisions to the Town's current local limits is shown in **Table 6-9** through redline/strikeout form.

Table 6-9: Summary of Proposed Local Limits Revisions

Constituent	Local Limit	Units
Aluminum	5.0	mg/L
~~Total Kjeldahl Nitrogen (as Ammonia)~~	~~2,600~~	~~mg/L~~
Antimony	5.0	mg/L
Arsenic	0.5	mg/L
Barium	5.0	mg/L
Beryllium	1.0	mg/L
~~Biochemical Oxygen Demand (BOD)~~	~~20,000~~	~~mg/L~~
Boron	1.0	mg/L
Cadmium	0.02	mg/L
Total chlorinated hydrocarbons	0.002 (trace)	mg/L
Chromium (total)	0.01	mg/L
Cobalt	0.5	mg/L
Copper	0.5	mg/L
Cyanide (total)	0.2	mg/L
Total Dissolved Solids (TDS)	5,000	mg/L
Fluorides	2.0	mg/L
Formaldehydes	5.0	mg/L
Iron	5.0	mg/L
Lead	0.5	mg/L
Manganese	1.0	mg/L

Constituent		Local Limit	Units
Mercury		0.001	mg/L
Total Oil and Grease (non-floatable grease, oil, fat, ether-soluble matter other than soap)		500	mg/L
Total Petroleum Hydrocarbons (floatable grease, oil, fat, ether-soluble matter)		50	mg/L
Phenol and derivatives		0.5	mg/L
Nickel		0.2	mg/L
Selenium		5.0	mg/L
Silver		0.05	mg/L
~~Total Suspended Solids (TSS)~~		~~10,000~~	~~mg/L~~
Total Toxic Organics (TTO)[1]		2.13	mg/L
Zinc		1.0	mg/L
Biological Oxygen Demand (BOD)[2]	Flow < 1,500 gpd[3]	10	lb/day
	Flow 1,500 – 25,000 gpd	33	lb/day
	Flow > 25,000 gpd	44	lb/day
Total Suspected Solids (TSS)[2]	Flow < 1,500 gpd	7.5	lb/day
	Flow 1,500 – 25,000 gpd	27	lb/day
	Flow > 25,000 gpd	40	lb/day
Ammonia (as Nitrogen)[2]	Flow < 1,500 gpd	1.8	lb/day
	Flow 1,500 – 25,000 gpd	6.0	lb/day
	Flow > 25,000 gpd	7.9	lb/day
Phosphorus[2]	Flow < 1,500 gpd	0.34	lb/day
	Flow 1,500 – 25,000 gpd	1.1	lb/day
	Flow > 25,000 gpd	1.5[4]	lb/day

Notes:

1. Federal Register List from 40 CFR 131 Subpart D — Total Toxic Organics less pesticides and dioxins
2. The BOD, TSS, ammonia, and phosphorus limits are based on the discharger's average annual flow rate. Mass-based local limit compliance determination shall be based on representative paired daily flow and concentration values.
3. The Town reserves the discretion to permit exceptions to the Tier I BOD local limit where a discharger may pay a fee for its total discharge load in lieu of compliance with the local limits. The applicable rate is identified in the "WW Usage Rate Components for Special Situations" section of the Town's wastewater rates.
4. The numeric limit is supplemented with narrative best management practices (BMP) source control approach for reduced phosphorus loads.

7. REFERENCES

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APPENDIX A: CURRENT LOCAL LIMITS

Table A-1: Summary of Current Local Limits for the Town of Windsor

Constituent	Local Limit, mg/L[1]
Aluminum	5.0
Total Kjeldahl Nitrogen (as Ammonia)	2,600
Antimony	5.0
Arsenic	0.5
Barium	5.0
Beryllium	1.0
Biochemical Oxygen Demand (BOD)	20,000
Boron	1.0
Cadmium	0.02
Total chlorinated hydrocarbons	0.002 (trace)
Chromium (total)	0.01
Cobalt	0.5
Copper	0.5
Cyanide (total)	0.2
Total Dissolved Solids (TDS)	5,000
Fluorides	2.0
Formaldehydes	5.0
Iron	5.0
Lead	0.5
Manganese	1.0
Mercury	0.001
Total Oil and Grease (non-floatable grease, oil, fat, ether-soluble matter other than soap)	500
Total Petroleum Hydrocarbons (floatable grease, oil, fat, ether-soluble matter)	50
Phenol and derivatives	0.5
Nickel	0.2
Selenium	5.0
Silver	0.05
Total Suspended Solids (TSS)	10,000
Total Toxic Organics (TTO)[2]	2.13
Zinc	1.0

Notes:

1. The Town adopted its current Local Limits along with significant updates to its sewer ordinance in July 2010.
2. Federal Register List from 40 CFR 131 Subpart D — Total Toxic Organics less pesticides and dioxins

APPENDIX B: PLOTS OF INFLUENT AND EFFLUENT DATA FOR CONVENTIONAL POLLUTANTS AND METALS

Figure B-1: Antimony Concentration in Facility Influent

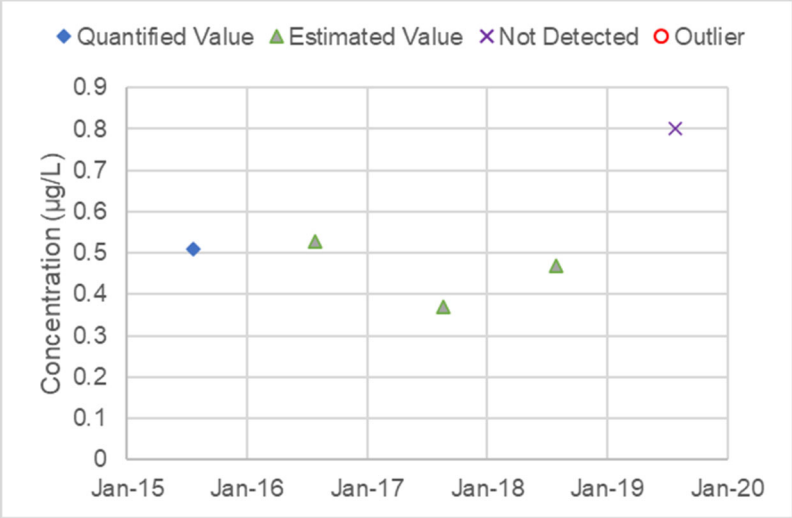


Figure B-2: Antimony Concentration in Facility Effluent

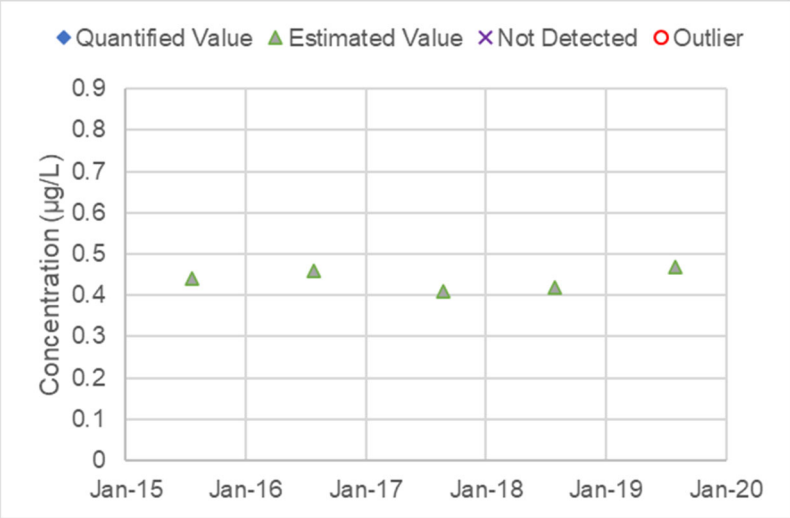


Figure B-3: Arsenic Concentration in Facility Influent

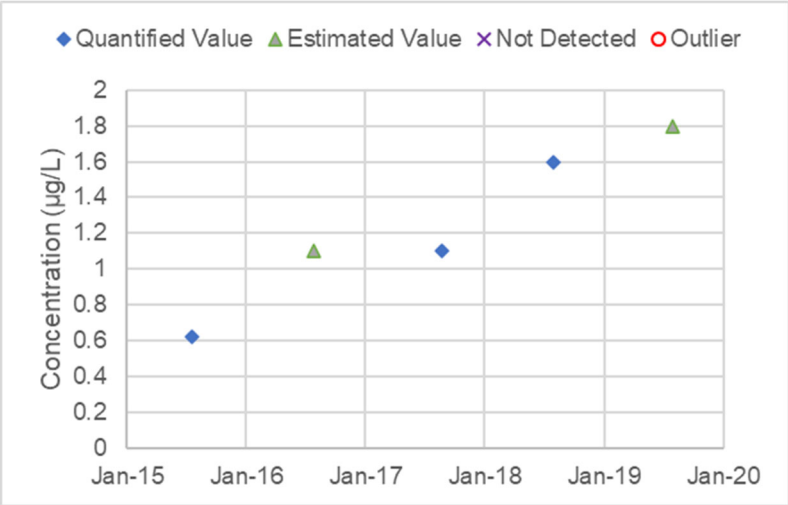


Figure B-4: Arsenic Concentration in Facility Effluent

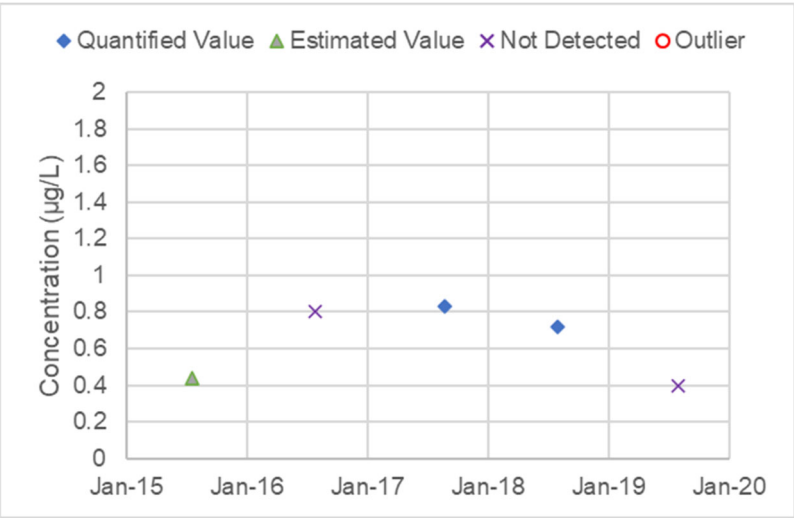


Figure B-5: Cadmium Concentration in Facility Influent

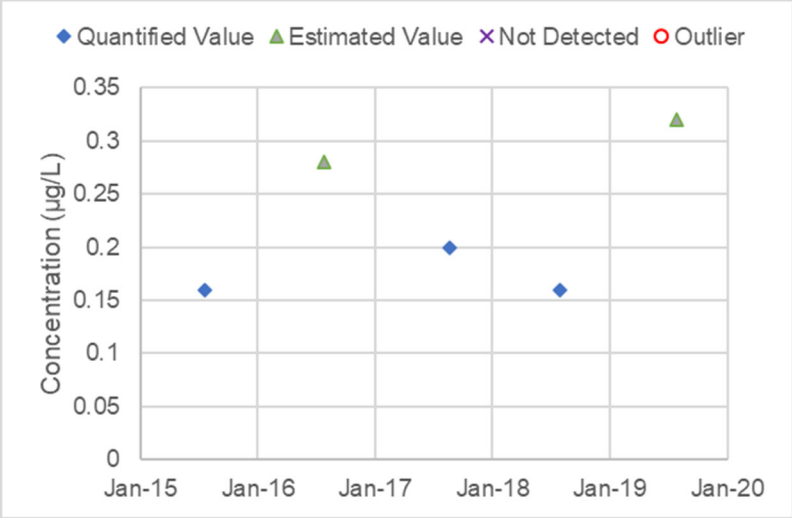
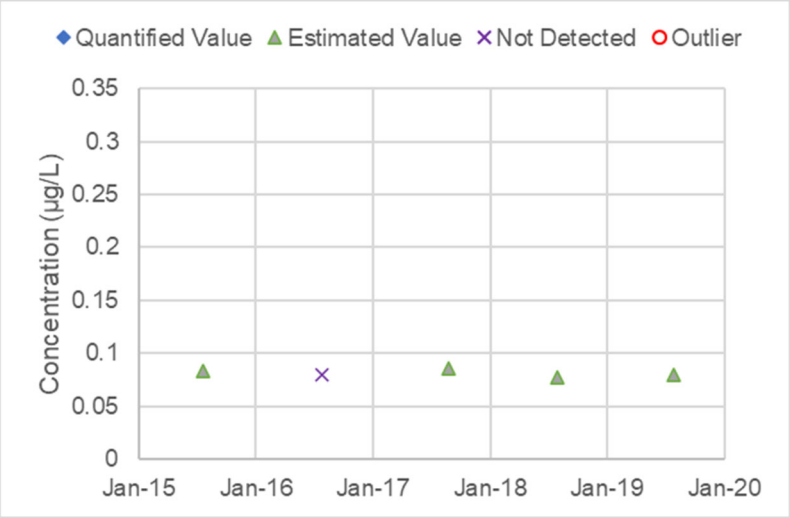


Figure B-6: Cadmium Concentration in Facility Effluent



B-7: Chromium Concentration in Facility Influent

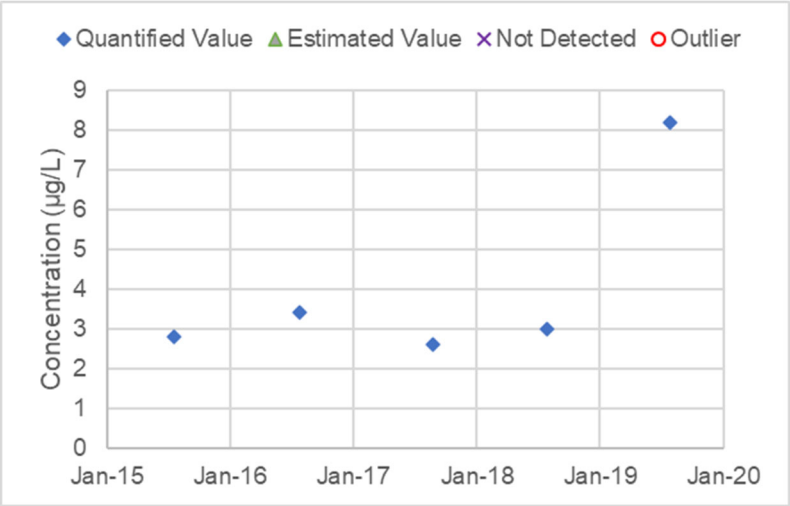


Figure B-8: Chromium Concentration in Facility Effluent

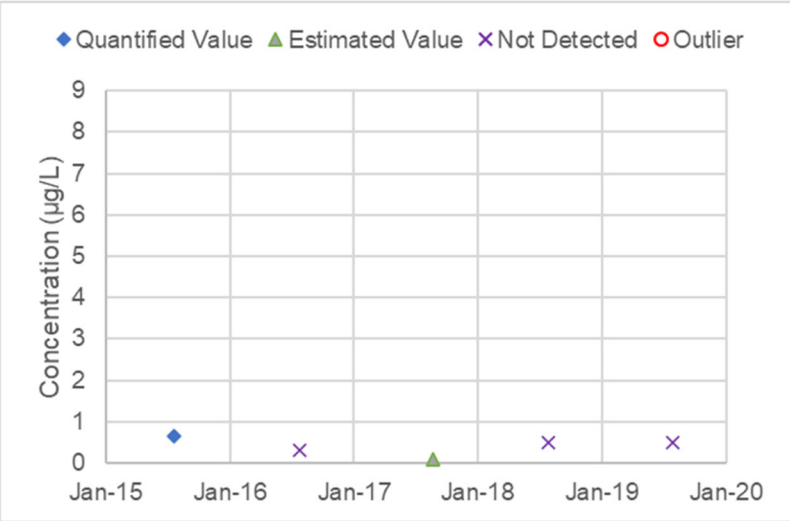


Figure B-9: Copper Concentration in Facility Influent

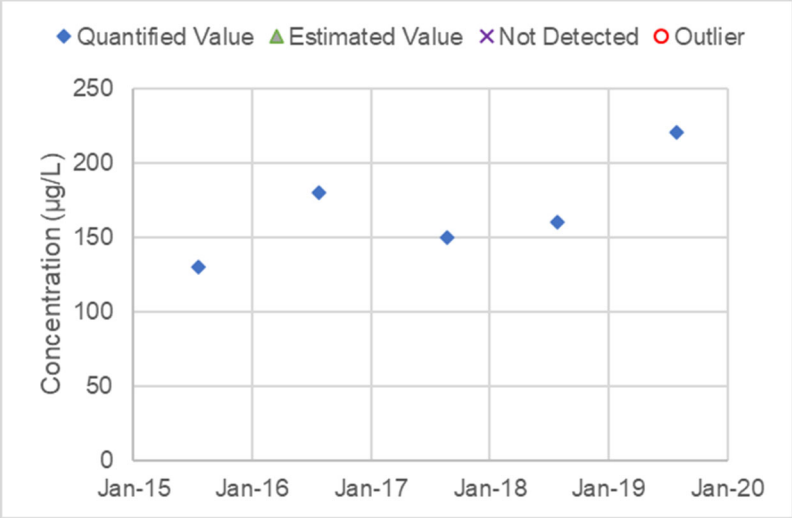


Figure B-10: Copper Concentration in Facility Effluent

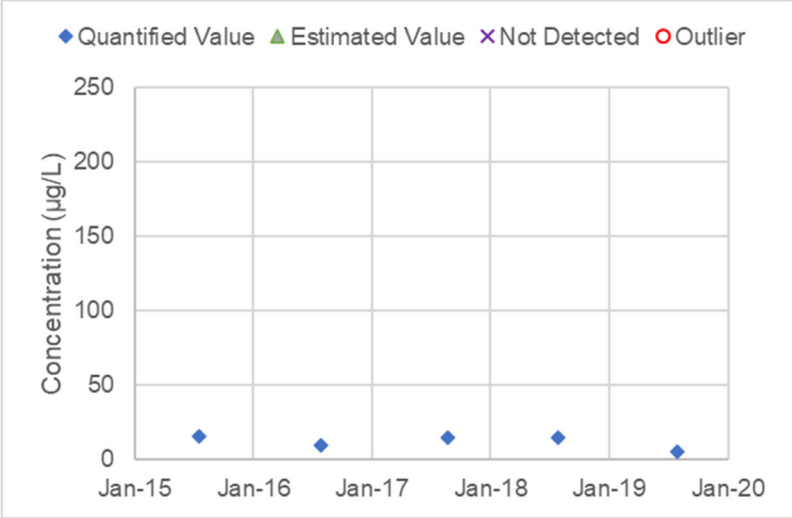


Figure B-11: Lead Concentration in Facility Influent

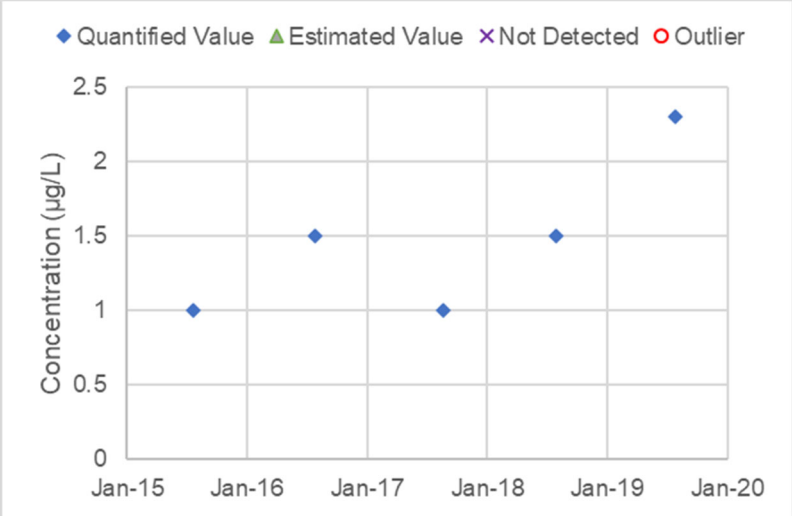


Figure B-12: Lead Concentration in Facility Effluent

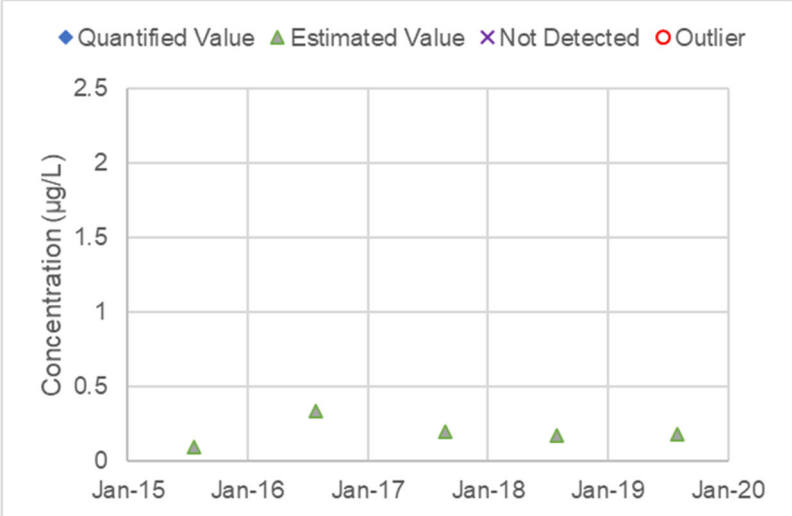


Figure B-13: Mercury Concentration in Facility Influent

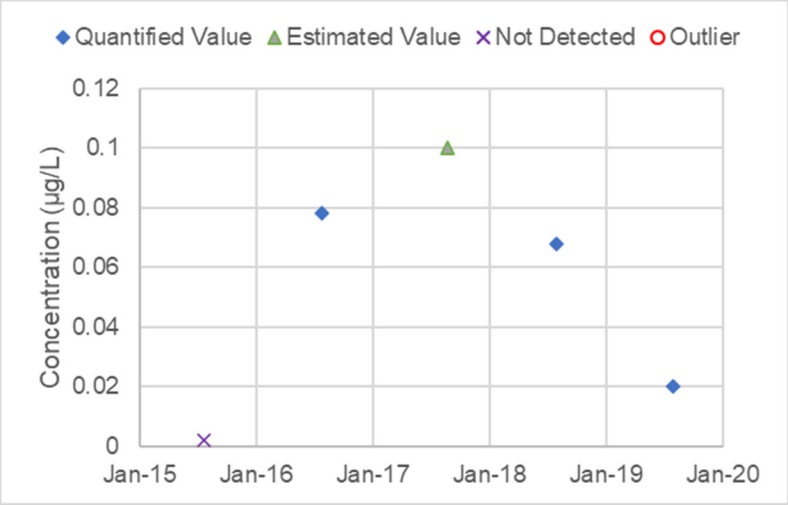


Figure B-14: Mercury Concentration in Facility Effluent

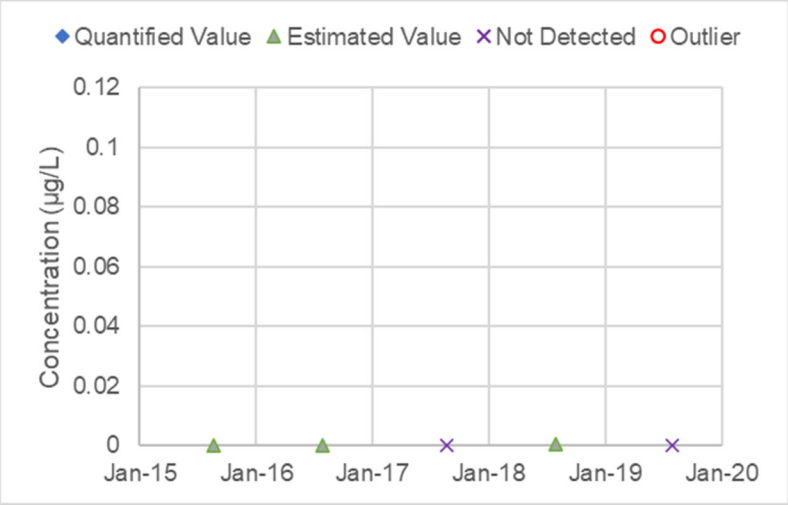


Figure B-15: Nickel Concentration in Facility Influent

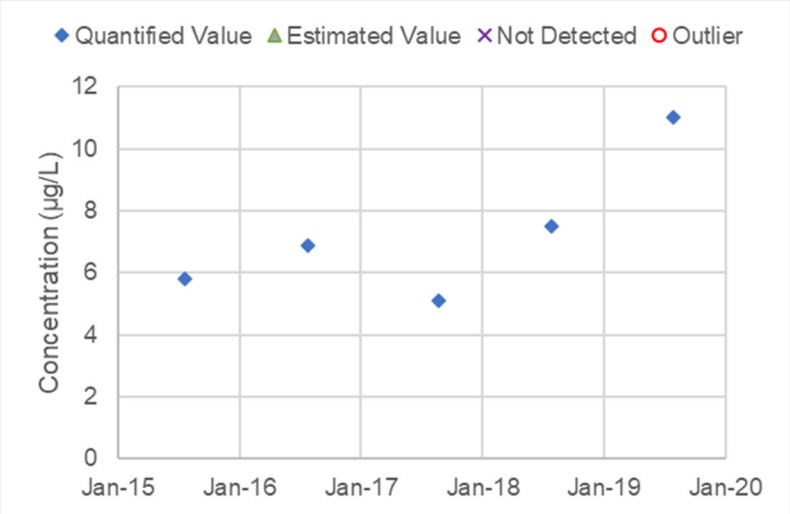


Figure B-16: Nickel Concentration in Facility Effluent

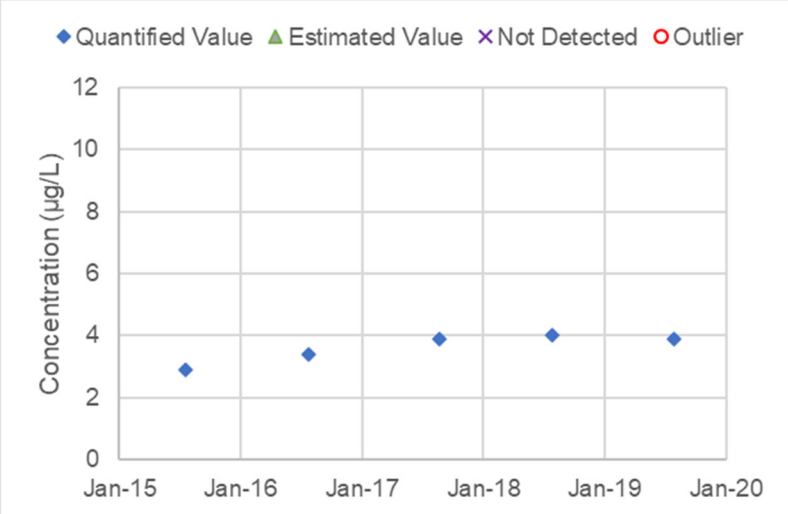


Figure B-17: Phenol Concentration in Facility Influent

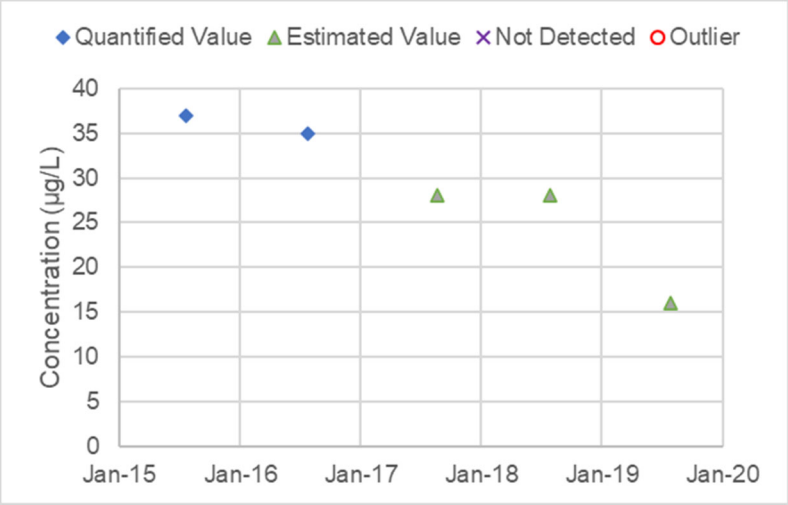


Figure B-18: Phenol Concentration in Facility Effluent

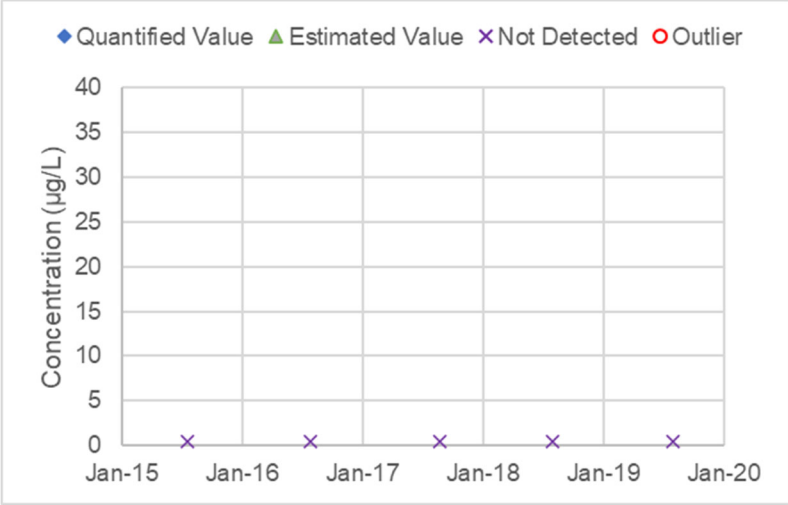


Figure B-19: Selenium Concentration in Facility Influent

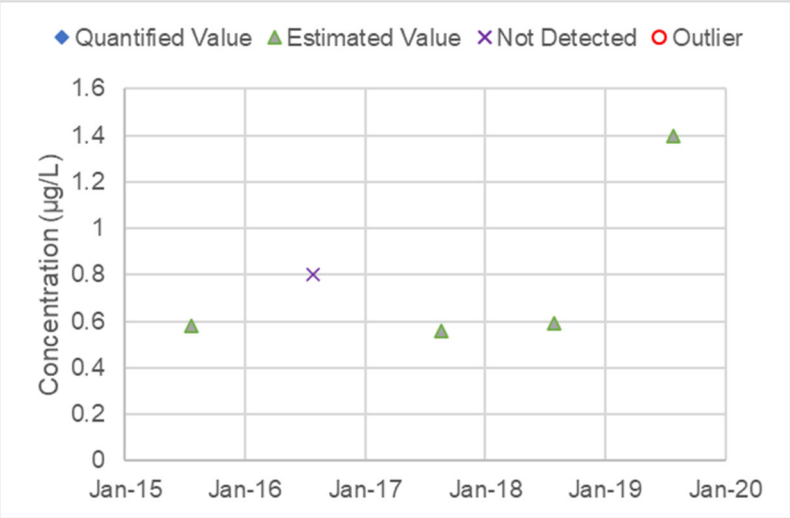


Figure B-20: Selenium Concentration in Facility Effluent

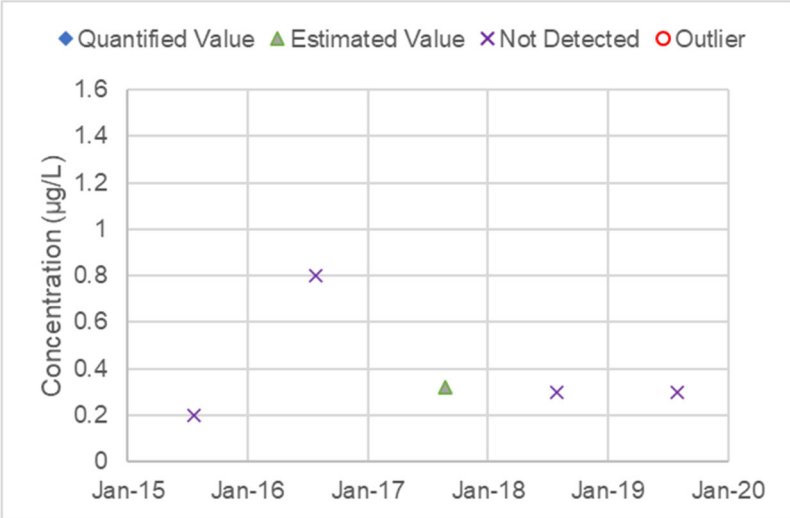


Figure B-21: Silver Concentration in Facility Influent

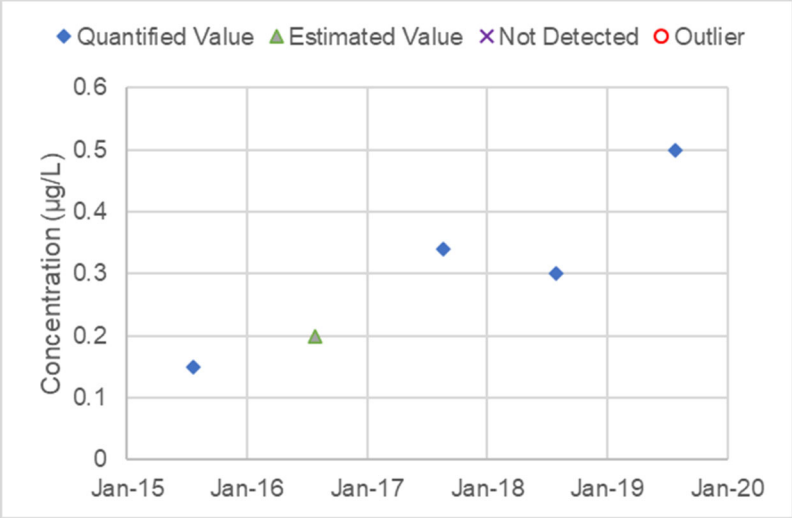


Figure B-22: Silver Concentration in Facility Effluent

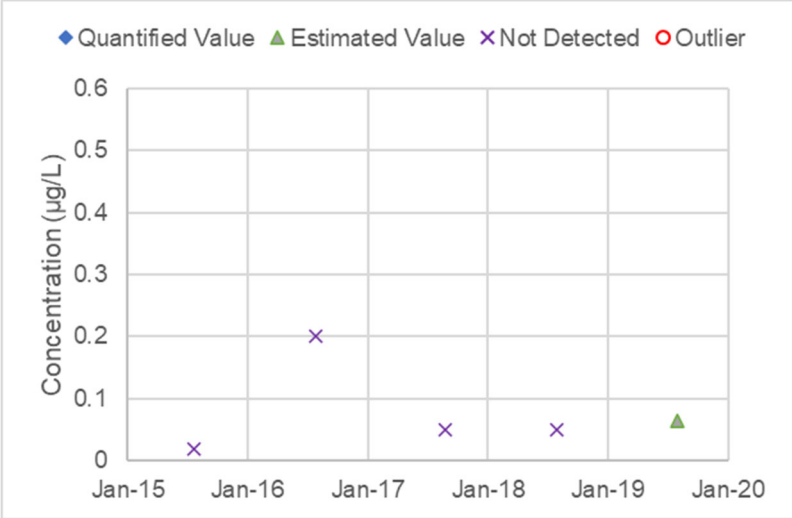


Figure B-23: Zinc Concentration in Facility Influent

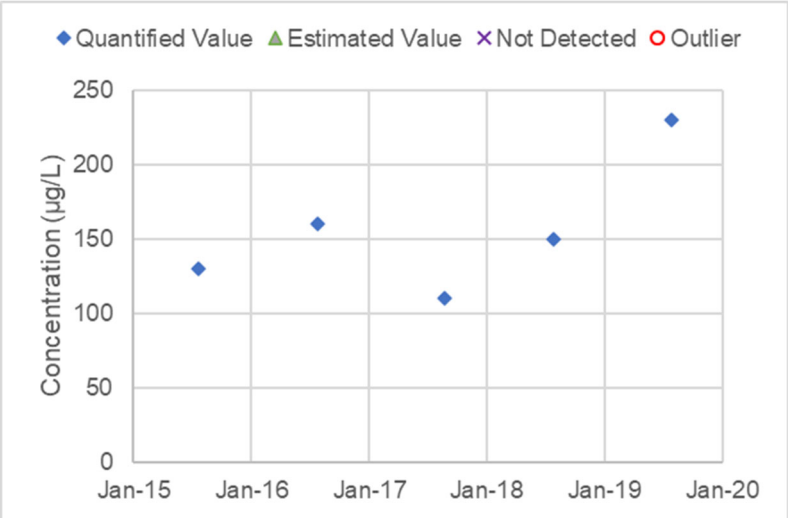


Figure B-24: Zinc Concentration in Facility Effluent

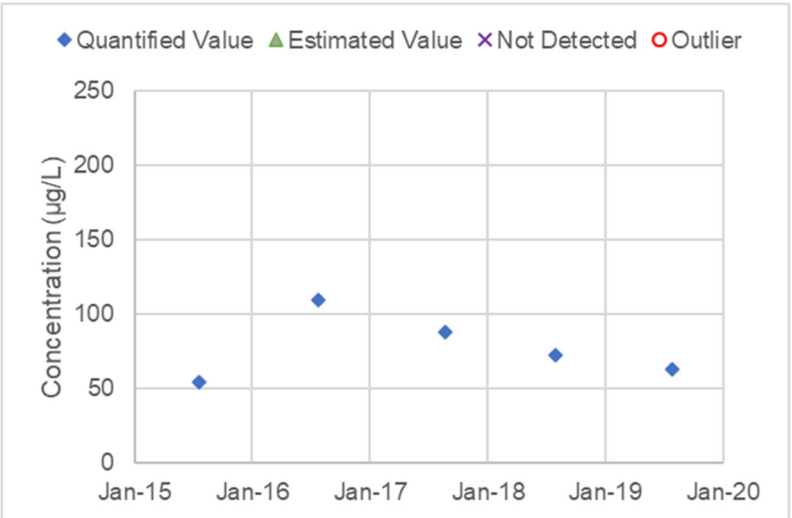


Figure B-25: BOD Concentration in Facility Influent

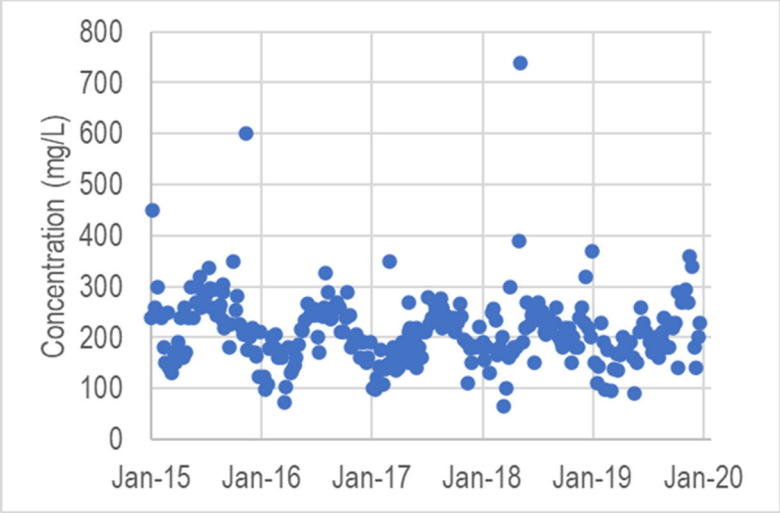


Figure B-26: BOD Load in Facility Influent

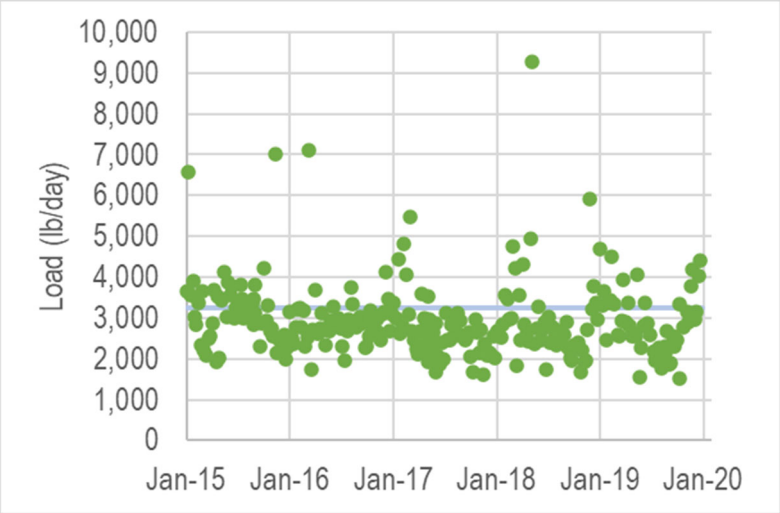


Figure B-27: TSS Concentration in Facility Influent

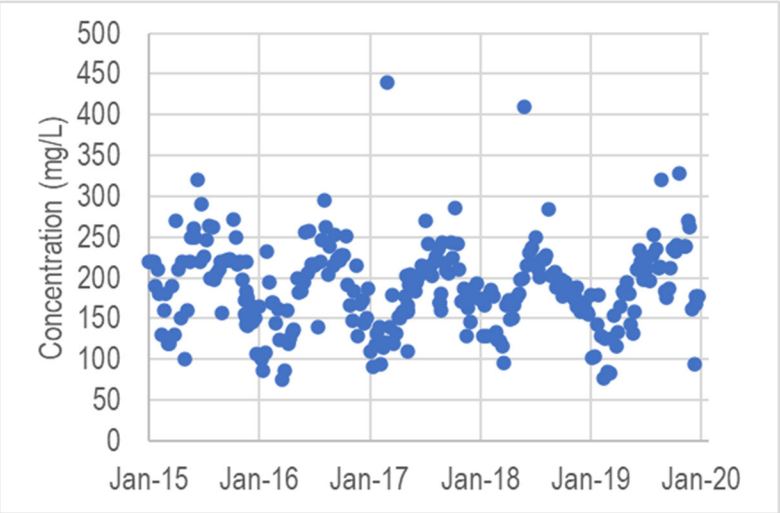


Figure B-28: TSS Load in Facility Influent

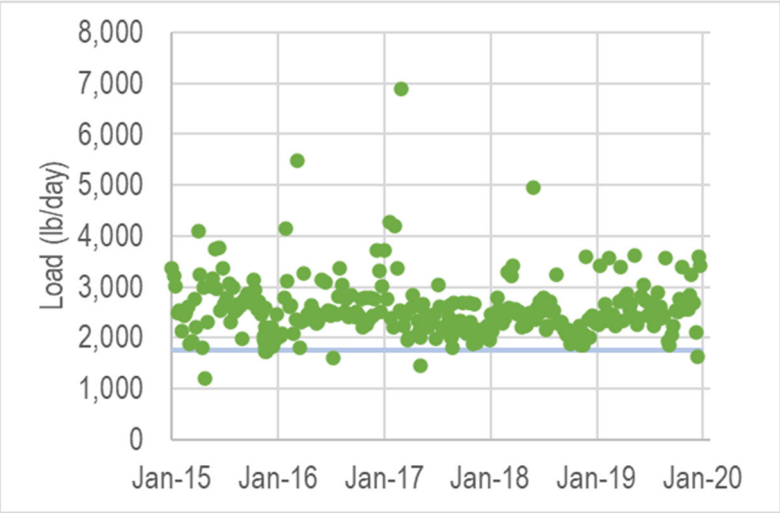


Figure B-29: Ammonia (as N) Concentration in Facility Influent

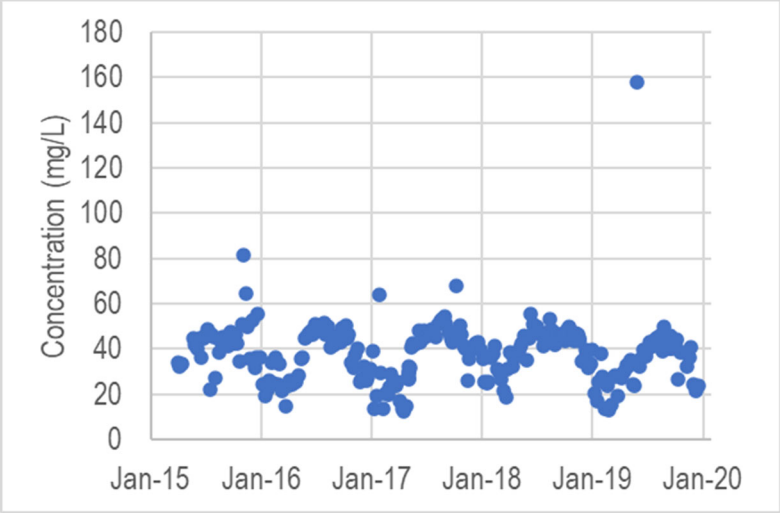


Figure B-30: Ammonia (as N) Load in Facility Influent

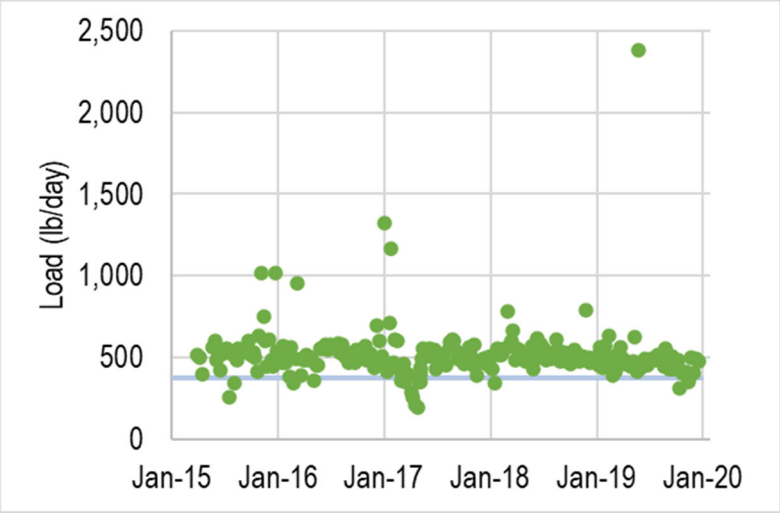


Figure B-31: Phosphorus Concentration in Facility Influent

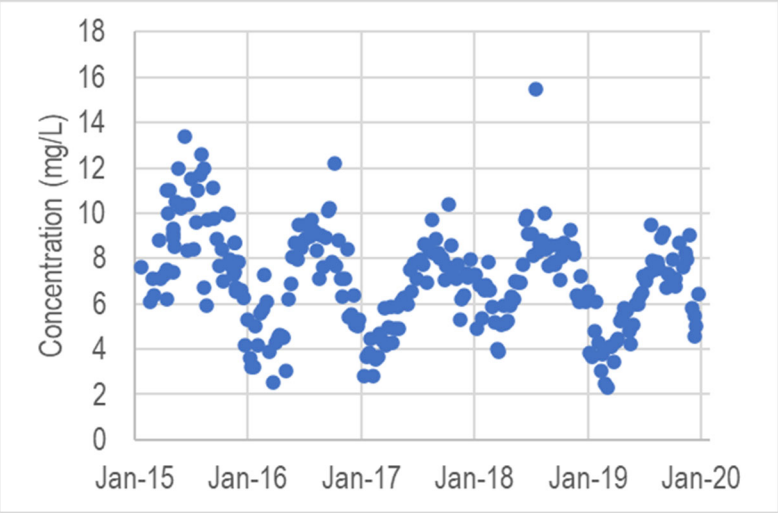


Figure B-32: Phosphorus Load in Facility Influent

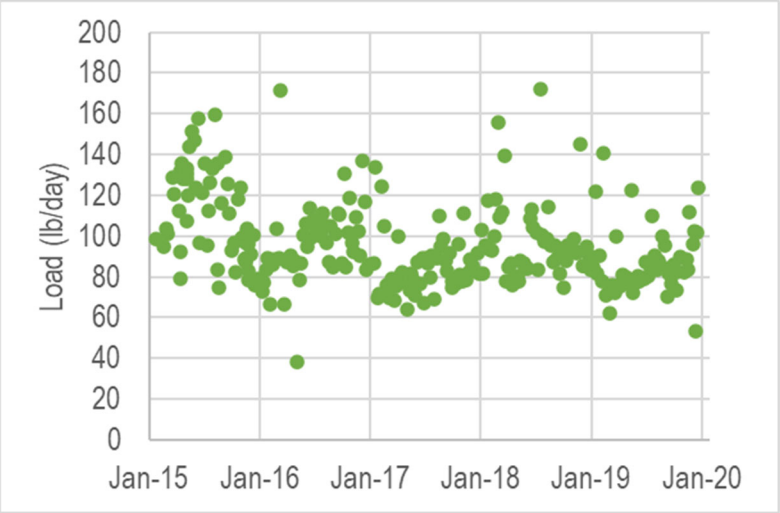


Figure B-33: TDS Concentration in Facility Effluent

