

This document provides pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Municipal permit. The discharge results from the operation of a 0.058 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia Water Quality Standards (effective June 5, 2017) and updating permit language as appropriate. The effluent limitations and special conditions contained within this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1. Facility Name and Mailing Address: Waterford Sewage Treatment Plant
44865 Loudoun Water Way
Ashburn, VA 20146
Facility Location: 40024 Old Wheatland Rd.
Waterford, VA 20197
Facility Contact Name: Kinsey Downes
Facility Email Address: wdownes@loudounwater.org
SIC Code: 4952 WWTP
NAICS Code: 221320 Sewage Treatment Facility
County: Loudoun
Telephone Number: (571) 291-7734
2. Permit No.: VA0060500
Other VPDES Permits: None.
Other Permits: None.
E2/E3/E4 Status: Not Applicable.
Expiration Date: February 11, 2019
3. Owner Name: Loudoun County Sanitation Authority d.b.a. Loudoun Water
Owner Contact / Title: Kinsey Downes / Manager of Community Systems
Owner Email Address: wdownes@loudounwater.org
Telephone Number: (571) 291-7734
4. Application Complete Date: August 28, 2018
Permit Drafted By: Caitlin Shipman
Draft Permit Reviewed By: Douglas Frasier
Draft Permit Reviewed By: Alison Thompson
Public Comment Period: Start Date: November 23, 2019
Date Drafted: July 23, 2019
Date Reviewed: July 25, 2019
Date Reviewed: August 8, 2019
End Date: December 27, 2019
5. Receiving Waters Information: See **Attachment 1** for the Flow Frequency Determination.
Receiving Stream Name: South Fork Catoctin Creek
Drainage Area at Outfall: 31.98 mi²
Stream Basin: Potomac River
Section: 10b
Special Standards: None
1Q10 Low Flow: 0.12 MGD
7Q10 Low Flow: 0.15 MGD
30Q10 Low Flow: 0.35 MGD
Harmonic Mean Flow: 2.54 MGD
Stream Code: 1aSOC
River Mile: 1.63
Subbasin: Potomac River
Stream Class: III
Waterbody ID/6th Order HUC: VAN-A02R / PL02
1Q10 High Flow: 1.48 MGD*
7Q10 High Flow: 1.91 MGD*
30Q10 High Flow: 3.03 MGD*
30Q5 Flow: 0.61 MGD
* High flow months are December – May.
6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

☒ State Water Control Law ☒ Clean Water Act ☒ VPDES Permit Regulation ☒ EPA NPDES Regulation	☐ EPA Guidelines ☒ Water Quality Standards ☐ Other (PES, Occoquan Policy, Dulles)
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7. Licensed Operator Requirements: Class III
8. Reliability Class: Class II
9. Facility / Permit Characterization:

☐ Private ☐ Federal ☐ State ☒ POTW ☒ eDMR Participant	☒ Effluent Limited ☒ Water Quality Limited ☐ Whole Effluent Toxicity Program ☒ Pretreatment Program ☒ Total Maximum Daily Load (TMDL)	☐ Possible Interstate Effect ☐ Compliance Schedule ☐ Interim Limits in Permit ☐ Interim Limits in Other Document
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10. Wastewater Sources and Treatment Description:

The collection system consists of one influent pump station and gravity sewer lines. The facility consists of two lagoons, two clarifiers, chlorination, dechlorination, and post-aeration.

Wastewater enters the headworks, is screened by a bar screen, and enters Lagoon 1. At design flow, Lagoon 1 has a detention time of approximately 8.25 days. At the end opposite from where the wastewater enters the lagoon, there is an 8-inch outlet that allows wastewater to flow to Lagoon 2. At design flow, Lagoon 2 also has a detention time of 8.25 days. Aeration in the lagoons is provided by air diffusion through a grid of ½-inch, slotted, polyethylene tubing laid in rows across the lagoon bottom. Each lagoon has a water surface of 194ft x 120ft x 10ft. The lagoons have sloped sides, and were designed with a bentonite clay bottom.

Typically, the lagoons operate in series. However, operators are able to pump all of the water from Lagoon 2 back into Lagoon 1, and vice versa. This allows for maintenance to be completed on a lagoon, without wastewater being discharged.

From the Lagoon 2, the wastewater flows by gravity, and is split between two secondary clarifiers. Each clarifier is a 10ft x 10ft square with a hopper bottom, and provides approximately 4.2 hours of detention time. Solids that settle in the hopper bottoms are drained to the influent pump station. Periodically, the clarifiers are drained completely and solids are removed by a vacuum truck and hauled offsite.

Following clarification, the wastewater is disinfected with chlorine. This is achieved by a 4-tube, tablet feed system that allows calcium hypochlorite tablets to dissolve into the wastewater as it flows through the feeder. The tanks are fitted with over/under baffles to prevent short-circuiting. The effluent is then dechlorinated, aerated, and discharged. Discharge is intermittent, but when occurring typically lasts from Monday to Friday.

See **Attachment 2** for a facility schematic.

See **Attachment 3** for the topographic map of Waterford (215A).

TABLE 1 OUTFALL DESCRIPTION				
Number	Discharge Sources	Treatment	Design Flow	Latitude / Longitude
001	Municipal Wastewater	See Section 10	0.058 MGD	39° 11' 28.9" / 77° 36' 56.9"

11. Sludge Treatment and Disposal Methods:

Sludge is hauled to Broad Run Water Reclamation Facility (VA0091383) for final disposal.

12. Discharges, Intakes, Monitoring Stations, Other Items (Located Within Waterbody VAN-A02R):

TABLE 2 DISCHARGES, INTAKES & MONITORING STATIONS			
ID / Permit Number	Facility Name	Type	Receiving Stream
VAG110121	Virginia Concrete Company - Purcellville	Concrete Products GP	Catoctin Creek South Fork
VAG406175	Zurschmeide Steve Residence	Domestic Sewage GP	Catoctin Creek, UT
VAG406086	Smith Steven D Residence		North Fork Catoctin Creek
VAG406539	Price David Residence		North Fork Catoctin Creek, UT
VAG406103	Biraben Roger Residence		
VAG406477	Hillsboro Pub		South Fork Catoctin Creek, UT
VAG406168	Mohammad Mirzaie Vahid Residence		
VAG640102	Purcellville Town Water Treatment Plant	Potable WTP GP	
VA0020974	Hamilton Sewage Treatment Plant	VPDES IP	South Fork Catoctin Creek
VA0092924	Loudoun County Milling Company		
VA0060500	Waterford Sewage Treatment Plant		
1aSOC001.66	DEQ Water Quality Monitoring Station	Ambient	South Fork Catoctin Creek
1aSOC005.46			
1aSOC002.93	DEQ Water Quality Monitoring Station	Probabilistic	

13. Material Storage:

TABLE 3 MATERIAL STORAGE		
Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Aluminum Chloride Hydroxide Sulfate Solution	7 55-gal drums	Drum storage platforms, spill kit
Chlorine tablets	20 5-gal buckets	Dry storage, spill kit
Dechlorination tablets, 92.3% sodium sulfite	20 5-gal buckets	
Hydrated lime	2 55-lb bags	
Gasoline	1 500-gal tank	Double walled tank, spill kit
Diesel fuel	1 100-gal tank	Spill kit

14. Site Inspection:

Performed by DEQ-NRO Water Compliance staff, Mark Evans, and DEQ-NRO Water Permitting staff, Caitlin Shipman, on May 29, 2019 (**Attachment 4**).

15. Receiving Stream Water Quality and Water Quality Standards:**a. Ambient Water Quality Data**

This facility discharges to South Fork Catoctin Creek. The nearest DEQ ambient monitoring station is 1aSOC001.66, located at the Rt. 698 bridge crossing, approximately 0.03 miles upstream of Outfall 001. The following is the water quality summary for this segment of South Fork Catoctin Creek, as taken from the 2018 Integrated Report:

Class III, Section 10b.

DEQ monitoring stations located in this segment of South Fork Catoctin Creek:

- *Ambient water quality monitoring station 1aSOC001.66 at Route 698*
- *Ambient water quality monitoring station 1aSOC005.46 at Route 9*
- *Freshwater probabilistic monitoring station 1aSOC002.93, 1.2 miles upstream from Route 698*

Biological monitoring finds a benthic macroinvertebrate impairment, resulting in an impaired classification for the aquatic life use. In 2006, an observed effect for the aquatic life use was noted based on three of 15 samples (20.0%) exceeding the total phosphorus screening value of 0.20 mg/L. While nutrients will not be assessed until nutrient standards are adopted for free-flowing streams, the observed effect remains. An observed effect for mercury (Hg) in sediment was also noted due to an exceedance of the freshwater consensus-based screening value (SV) of 1.06 parts per million (ppm) for mercury (Hg) in sediment recorded in 2001 at station 1aSOC001.66. This observed effect also remains.

E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. The Catoctin Creek bacteria TMDL for the Lower South Fork Catoctin Creek watershed has been completed and approved; the Catoctin Creek bacteria TMDL Implementation Plan is also complete. The wildlife use is considered fully supporting. There is insufficient information to determine support for the fish consumption use.

b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 4 303(d) IMPAIRMENT AND TMDL INFORMATION FOR THE RECEIVING STREAM SEGMENT						
Waterbody Name	Impaired Use	Cause	Year first Listed as Impaired	TMDL Completed	WLA	Basis for WLA
<i>Impairment Information in the 2018 Integrated Report:</i>						
South Fork Catoctin Creek	Aquatic Life	Benthic Macro-invertebrates	2008	No	---	---
	Recreation	<i>E. coli</i>	1996	Catoctin Creek Bacteria 05/31/2002	1.60E+11 cfu/year fecal coliform 1.01E+11 cfu/year <i>E. coli</i> *	200 cfu/100 mL fecal coliform 126 cfu/100 mL <i>E. coli</i> * --- 0.058 MGD

* The WLA is expressed in the Catoctin Creek Bacteria TMDL as cfu/year fecal coliform bacteria.

This facility discharges to the South Fork Catoctin Creek within the Chesapeake Bay watershed. The receiving stream has been identified in the Chesapeake Bay TMDL; approved by the Environmental Protection Agency (EPA) on December 29, 2010. The TMDL addresses dissolved oxygen (DO), chlorophyll a and submerged aquatic vegetation (SAV) impairments in the main stem Chesapeake Bay and its tributaries by establishing nonpoint source load allocations (LAs) and point source wasteload allocations (WLAs) for total nitrogen (TN), total phosphorus (TP) and total suspended solids (TSS) to meet applicable Virginia Water Quality Standards contained in 9VAC25-260-185.

Implementation of the Chesapeake Bay TMDL is currently accomplished in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP); approved by EPA on December 29, 2010. The approved WIP recognizes the *General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia* (9VAC25-820 et seq.) as controlling the nutrient allocations for non-significant Chesapeake Bay dischargers. The approved WIP states that for non-significant municipal facilities, nutrient WLAs are to be consistent with Code of Virginia procedures, which set baseline WLAs at 2005 permitted design capacity nutrient load levels. In accordance with the WIP, TN and TP WLAs for non-significant facilities are considered aggregate allocations and will not be included in individual permits. The WIP also considers TSS WLAs for non-significant facilities to be aggregate allocations; however, TSS limits are to be included in individual VPDES permits in conformance with the technology-based requirements found in the Clean Water Act. Furthermore, the WIP recognizes that so long as the aggregated TSS permitted loads for all dischargers is less than the aggregated TSS load in the WIP, the individual permit will be consistent with the TMDL.

40 CFR 122.44(d)(1)(vii)(B) requires permits to be written with effluent limits necessary to meet water quality standards and to be consistent with the assumptions and requirements of applicable WLAs. This facility is classified as a non-significant Chesapeake Bay discharger and has not made application for a new or expanded discharge since 2005. It is therefore covered by rule under the 9VAC25-820 regulation. In accordance with the WIP, TN and TP load limits are not included in this individual permit, but are consistent with the TMDL because the current nutrient loads are in conformance with the facility's 2005 permitted design capacity loads. This individual permit includes TSS limits of 30 mg/L that are in conformance with technology-based requirements and, in turn, are consistent with the Chesapeake Bay TMDL.

In addition, this individual permit contains limits for ammonia, BOD₅ and dissolved oxygen which provide protection of instream DO concentrations of at least 5.0 mg/L. Furthermore, implementation of the full Chesapeake Bay WIP, including GP reductions combined with actions proposed in other source sectors, is expected to adequately address ambient conditions such that the proposed effluent limits found within this individual permit are consistent with the Chesapeake Bay TMDL and will not cause an impairment or observed violation of the standards for DO, chlorophyll a or SAV as required by 9VAC25-260-185.

The full planning statement is found in **Attachment 5**.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, South Fork Catoctin Creek, is located within Section 10b of the Potomac River Basin and classified as Class III water.

At all times, Class III waters must achieve a dissolved oxygen (DO) of 4.0 mg/L or greater, a daily average DO of 5.0 mg/L or greater, a temperature that does not exceed 32° C and maintain a pH of 6.0 – 9.0 standard units (SU).

The Freshwater Water Quality/Wasteload Allocation Analysis details other water quality criteria applicable to the receiving stream (**Attachment 6**).

Some Water Quality Criteria are dependent on the pH, temperature and total hardness of the receiving stream and/or final effluent. These values were utilized to determine the criterion found in the Freshwater Water Quality/Wasteload Allocation Analysis for the following pollutants:

pH and Temperature for Ammonia Criteria

The fresh water, aquatic life Water Quality Criteria for ammonia is dependent on the instream pH and temperature. Since the effluent may have an impact on the instream values, the pH and temperature values of the effluent must also be considered when determining the ammonia criteria for the receiving stream. The 90th percentile pH and temperature values are utilized because they best represent the critical conditions of the receiving stream.

During the previous permit term, staff evaluated ambient data from monitoring station 1aSOC001.66, sampled every other month, between July 2003 and November 2011 (Table 5). Effluent data from January 2010 – July 2013 was reviewed as well (Table 6).

TABLE 5 AMBIENT 90 TH PERCENTILE pH AND TEMPERATURE VALUES FROM 2014 REISSUANCE		
Season	pH (SU)	Temperature (°C)
Annual	7.94	24.8
December – May	8.0	18.8

TABLE 6 EFFLUENT 90 TH PERCENTILE pH AND TEMPERATURE VALUES FROM 2014 REISSUANCE		
Season	pH (SU)	Temperature (°C)
Annual	7.7	21.1
December – May	7.6	26.6

With this reissuance, staff re-evaluated ambient data from monitoring station 1aSOC001.66, sampled monthly during the year 2016 (**Attachment 7**). Effluent data from February 2017 – March 2019 was reviewed as well (**Attachment 8**).

TABLE 7 AMBIENT pH AND TEMPERATURE VALUES			
Season	pH (SU)		Temperature (°C), 90 th percentile
	90 th percentile	10 th percentile	
Annual	7.65	6.77	23.53
December – May	--		13.50

TABLE 8 EFFLUENT pH AND TEMPERATURE VALUES			
Season	pH (SU)		Temperature (°C), 90 th percentile
	90 th percentile	10 th percentile	
Annual	7.60	6.80	25.6
December – May	--		21.45

Hardness Dependent Metals Criteria

The Water Quality Criteria for some metals are dependent on the receiving stream and/or effluent total hardness values (expressed as mg/L calcium carbonate).

There is no hardness data for this facility/receiving stream. Staff guidance suggests utilizing a default hardness value of 50 mg/L as CaCO₃ for streams east of the Blue Ridge. The hardness dependent metals criteria in the Freshwater Water Quality/Wasteload Allocation Analysis are based on this default value (**Attachment 6**).

Bacteria Criteria

The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli bacteria per 100 mL of water shall not exceed the following:

	Geometric Mean ¹
Freshwater <i>E. coli</i> (N/100 mL)	126

¹For a minimum of four weekly samples taken during any calendar month

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, South Fork Catoctin Creek, is located within Section 10b of the Potomac River Basin. This section has not been designated with a special standard.

e. Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on April 19, 2019 for records to determine if there are threatened or endangered species in the vicinity of the discharge. The following threatened or endangered species were identified within a 2 mile radius of the discharge: Dwarf Wedgemussel (*Alasmodonta heterodon*), Northern Long-eared Bat (*Myotis septentrionalis*), Yellow Lance (*Elliptio lanceolate*), Little Brown Bat (*Myotis lucifugus*), Tri-colored Bat (*Perimyotis subflavus*), Brook Floater (*Alasmodonta varicosa*), Wood Turtle (*Glyptemys insculpta*), Peregrine Falcon (*Falco peregrinus*), Loggerhead Shrike (*Lanius ludovicianus*), Henslow's Sparrow (*Ammodramus henslowii*), Green Floater (*Lasmigona subviridis*), and Migrant Loggerhead Shrike (*Lanius ludovicianus migrans*). The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge.

In addition, the Virginia Department of Game and Inland Fisheries were coordinated during this reissuance per the procedures as set forth in the 2007 Memorandum of Understanding (MOU) concerning Threatened and Endangered Species Screening for VPDES Permits. The purpose of this coordination is to obtain input from other agencies during the permitting process to ascertain potential adverse impacts to threatened and endangered species and/or their habitats. Any comments from this agency are located in Section 26 of this Fact Sheet.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

This section of the receiving stream is considered impaired, based on data collected from the monitoring station immediately upstream of the outfall (Section 15a). Therefore, it is staff's professional judgement that the receiving stream be classified as Tier 1.

The proposed permit limits have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points are equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLAs) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. In the case of ammonia evaluations, limits are needed if the 97th percentile of the thirty-day average effluent concentration values is greater than the chronic WLA. Effluent limitations are then calculated on the most limiting WLA, the required sampling frequency and statistical characteristics of the effluent data.

a. Effluent Screening

Effluent data obtained from Discharge Monitoring Reports for June 2014 – December 2018 has been reviewed and determined to be suitable for evaluation (**Attachment 9**). Effluent data were reviewed and there have been no exceedances of the established limitations.

The following pollutants require a wasteload allocation analysis: ammonia and total residual chlorine.

b. Mixing Zones and Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:

WLA	=	Wasteload allocation
C _o	=	In-stream water quality criteria
Q _e	=	Design flow
Q _s	=	Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; harmonic mean for carcinogen-human health criteria; 30Q10 for ammonia criteria; and 30Q5 for non-carcinogen human health criteria)
f	=	Decimal fraction of critical flow
C _s	=	Mean background concentration of parameter in the receiving stream.

The Water Quality Standards contain two distinct mixing zone requirements. The first requirement is general in nature and allows the use of mixing zone concepts in evaluating permit limits for acute and chronic standards in 9VAC25-260-140.B. The second requirement is specific and establishes special restrictions for regulatory mixing zones established by the Board.

The Department of Environmental Quality uses a simplified mixing model to estimate the amount of mixing of a discharge with the receiving stream within specified acute and chronic exposure periods. The simplified model contains the following assumptions and approximations:

- The effluent enters the stream from the bank, either via a pipe, channel or ditch.
- The effluent velocity isn't significantly greater (no more than 1 - 2 ft/sec greater) than the stream velocity.
- The receiving stream is much wider than its depth (width at least ten times the depth).
- Diffusive mixing in the longitudinal direction (lengthwise) is insignificant compared with advective transport (flow).
- Complete vertical mixing occurs instantaneously at the discharge point. This is assumed since the stream depth is much smaller than the stream width.
- Lateral mixing (across the width) is a linear function of distance downstream.
- The effluent is neutrally buoyant (e.g. the effluent discharge temperature and salinity are not significantly different from the stream's ambient temperature and salinity).
- Complete mix is determined as the point downstream where the variation in concentration is 20% or less across the width and depth of the stream.
- The velocity of passing and drifting organisms is assumed equal to the stream velocity.

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent (e.g., total residual chlorine where chlorine is used as a means of disinfection) and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to this discharge, ammonia and total residual chlorine may be present. As such, **Attachment 10** details the mixing analysis results for subsequent WLA derivations found in the Freshwater Water Quality/Wasteload Allocation Analysis (**Attachment 6**) for these pollutants.

c. Effluent Limitations, Outfall 001 – Toxic Pollutants

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N/TKN

Staff reevaluated pH and temperature and has concluded it is significantly different than what was used previously to derive ammonia criteria. As a result, staff used the new data to determine new ammonia water quality criteria and new wasteload allocations (WLAs). DEQ guidance suggests using a sole data point of 9.0 mg/L to ensure the evaluation adequately addresses the potential ammonia in a discharge containing domestic sewage. The reasonable potential analysis shows no limit is needed (**Attachment 11a**).

There were no exceedances of the ammonia limit during the previous permit term. Due to antibacksliding provisions at 9VAC25-31-220.L., it is staff's professional judgement there is no basis to backslide with this reissuance; the existing ammonia limitations are proposed to continue in the reissued permit (**Attachment 11b**).

The Environmental Protection Agency (EPA) finalized new, more stringent ammonia criteria in August 2013. It is staff's understanding that the new ammonia criteria may result in significant reductions in ammonia effluent limitations and that the incorporation of those criteria into the Virginia Water Quality Standards is forthcoming. This and many other facilities may be required to comply with these new criteria during their next respective permit terms. The ammonia criteria will be revisited during the next reissuance.

2) Total Residual Chlorine (TRC)

Chlorine is utilized for disinfection and is potentially in the discharge. During the previous permit term, staff calculated WLAs for TRC using current critical flows and the mixing allowance. In accordance with current DEQ guidance, staff employed a default data point of 0.2 mg/L and the calculated WLAs to derive limits. A monthly average of 0.017 mg/L and a weekly average limit of 0.019 mg/L are proposed for this discharge (**Attachment 12**). There were no changes in the WLAs with this reissuance, therefore, the limits will be carried forward with this reissuance.

3) Metals/Organics

No metals or organics data were available for review. Given the wastewater sources, it is staff's professional judgement that monitoring is not required at this time.

d. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (DO), biochemical oxygen demand-5 day (BOD₅), total suspended solids (TSS) or pH limitations are proposed.

Dissolved oxygen and BOD₅ limitations are based on the stream modeling conducted in October 1973 (**Attachment 13**) and are set to meet the water quality criteria for DO in the receiving stream. The stream model set the BOD₅ at a monthly average of 19.2 mg/L at a design flow of 0.0557 MGD. There is no documentation for relaxation of the BOD₅ limit to 24 mg/L. However, it has been carried forward since the 1993 reissuance and has not caused a degradation of water quality, therefore, it shall be carried forward with this reissuance.

The TSS limit is set to meet the Federal Effluent Secondary Treatment Standards.

pH and *E. coli* limitations are in accordance with the Water Quality Standards, 9VAC25-260-50 and 9VAC25-260-170, respectively.

e. Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients

VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries.

Additionally, data from the monitoring station located immediately upstream shows a benthic impairment. DEQ-NRO Planning and TMDL staff typically request quarterly nutrient monitoring of all municipal facilities located within a five mile distance of an impairment (**Attachment 5**).

Monitoring for nitrates + nitrites, ammonia, total nitrogen and total phosphorus are included in this permit. The monitoring is to verify the assumptions under the approved WIP as provided in Guidance Memo No. 14-2011, *Nutrient Monitoring for “Nonsignificant” Discharges to the Chesapeake Bay Watershed*, and at the request of DEQ-NRO Planning and TMDL staff.

This facility has an ammonia limit from June to November. Therefore, monitoring will be implemented from December – May. Because this time period does not include a complete calendar quarter period, monitoring will be on a monthly basis. All other nutrient monitoring will be quarterly.

f. Effluent Limitations and Monitoring Summary

The effluent limitations are presented in Section 19. Limits were established for biochemical oxygen demand-5 day (BOD₅), total suspended solids (TSS), ammonia as N, pH, dissolved oxygen (DO), total residual chlorine, and *E. coli*. Monitoring was established for flow, nitrate+nitrite, total Kjeldahl nitrogen, total nitrogen, and total phosphorus.

The limit for total suspended solids is based on staff’s professional judgement.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and then a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

During the current permit term, the permittee conducted annual influent monitoring for BOD₅ and TSS. Staff reviewed the results, which indicated that this facility is achieving > 85% removal consistently. Since the permittee has demonstrated the removal efficiency of this treatment works, it is staff’s professional judgement that influent monitoring on an annual basis not be included with this reissuance.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

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19. Effluent Limitations/Monitoring Requirements:

Design Flow: 0.058 MGD.
Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
		Monthly Average		Weekly Average		Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL		NA		NA	NL	Continuous	TIRE
pH	3	NA		NA		6.0 SU	9.0 SU	1/D	Grab
BOD ₅	3,4	24 mg/L	5.3 kg/day	36 mg/L	7.9 kg/day	NA	NA	1/W	4H-C
Total Suspended Solids (TSS)	2	30 mg/L	6.6 kg/day	45 mg/L	9.9 kg/day	NA	NA	1/W	4H-C
Dissolved Oxygen (DO)	3,4	NA		NA		6.8 mg/L	NA	1/D	Grab
Ammonia, as N (June – November)	2,3	12 mg/L		18 mg/L		NA	NA	1/W	4H-C
Ammonia, as N (December – May)	3,	NL mg/L		NA		NA	NA	1/M	4H-C
<i>E. coli</i> (Geometric Mean) ^{a b}	3	126 n/100 mL		NA		NA	NA	1/W	Grab
Total Residual Chlorine (after contact tank)	2,6	NA		NA		1.0 mg/L	NA	3/D	Grab
Total Residual Chlorine (after dechlorination)	3	0.017 mg/L		0.019 mg/L		NA	NA	3/D	Grab
Nitrate+Nitrite	3,5	NL mg/L		NA		NA	NA	1/Q	4H-C
Total Kjeldahl Nitrogen	3,5	NL mg/L		NA		NA	NA	1/Q	4H-C
Total Nitrogen	3,5	NL mg/L		NA		NA	NA	1/Q	Calculated
Total Phosphorus	3,5	NL mg/L		NA		NA	NA	1/Q	4H-C

The basis for the limitations codes are:

- | | | |
|---|--|--|
| 1. Federal Effluent Requirements | MGD = Million gallons per day. | 1/D = Once every day. |
| 2. Professional Judgement | NA = Not applicable. | 1/W = Once every week. |
| 3. Water Quality Standards | NL = No limit; monitor and report. | 3/D = Three times every day, at four hour intervals. |
| 4. Stream Model – Attachment 13 | SU = Standard units. | |
| 5. Planning Statement – Attachment 5 | TIRE = Totalizing, indicating and recording equipment. | 1/Q = Once every calendar quarter. |
| 6. DEQ Disinfection Guidance | | |

4H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the monitored 4-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of 4 (four) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum 4 (four) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by 10% or more during the monitored discharge.

Estimate = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.

Grab = An individual sample collected over a period of time not to exceed 15 minutes.

^a Samples shall be collected between 10:00 a.m. and 4:00 p.m.

^b The permittee shall collect four (4) samples during one month within each quarterly monitoring period as defined below. The results shall be reported as the geometric mean.

The quarterly monitoring periods shall be January through March, April through June, July through September and October through December. The DMR shall be submitted no later than the 10th day of the month following the monitoring period.

Should any of the quarterly monitoring results for *E. coli* exceed 126 n/100 mL, reported as the geometric mean, the monitoring frequency shall revert to once per week for the remainder of the permit term.

20. Other Permit Requirements:**a. Permit Section Part I.B. Contains Additional Chlorine Monitoring Requirements, Quantification Levels and Compliance Reporting Instructions**

These additional chlorine requirements are necessary per the Sewage Collection and Treatment Regulations at 9VAC25-790 and by the Water Quality Standards at 9VAC25-260-170. Minimum chlorine residual must be maintained at the exit of the chlorine contact tank to assure adequate disinfection. No more than 10% of the monthly test results for TRC at the exit of the chlorine contact tank shall be < 1.0 mg/L with any TRC < 0.6 mg/L considered a system failure. *E. coli* limits are defined in this section as well as monitoring requirements to take effect should an alternate means of disinfection be used.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an instream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

The calculations for the nitrogen and phosphorus parameters shall be in accordance with the calculations set forth in 9VAC25-820 – *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*.

b. Permit Section Part I.C. Details the Requirements of a Pretreatment Program

The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.D requires all discharges to protect water quality. The VPDES Permit Regulation at 9VAC25-31-730 through 900., and the Federal Pretreatment Regulation at 40 CFR Part 403 establishes the legal requirements for state, local government and industry to implement National Pretreatment Standards. The intent is: (1) to prevent interference with the operation of the treatment works; (2) to prevent pass-through of pollutants resulting in violation(s) of the publicly owned treatment works (POTWs) VPDES permit limitations; and (3) to prevent municipal sludge contamination.

This facility is a POTW with a design flow of 0.058 MGD; owned and operated by Loudoun Water. The Loudoun County Sanitation Authority d.b.a. Loudoun Water developed its pretreatment legal authority through its Broad Run Water Reclamation Facility; VPDES Permit VA0091383. This pretreatment program was approved by DEQ on May 17, 2019. The approved pretreatment program requirements are applicable to all POTWs that are owned and operated by the same authority. Therefore, Loudoun Water will be required to conduct an industrial user survey of the collection system and submit the results to DEQ for review.

Program requirements and reporting are found in this Part I.C of the permit.

c. Permit Section Part I.D. Details the Requirements of Groundwater Monitoring

During the 2014 permit reissuance, a Ground Water Monitoring Plan special condition was included, requiring the development of a groundwater monitoring plan, as well as the installation and monitoring of groundwater wells. DEQ reviewed and approved the plan on October 8, 2014, as it met the requirements and intent of the agency guidance at that time. However, in 2018, DEQ finalized the *Guidance Memo for VPDES Permits with Groundwater Monitoring Requirements* (GM18-2013), which superseded previous groundwater monitoring requirements for VPDES permitting. One of the goals of this guidance memo is to make the requirements of groundwater monitoring plans and the review of groundwater monitoring data consistent across the Commonwealth. This and many other facilities will be asked to review, and update as necessary, their groundwater monitoring plan and monitoring well network to ensure it is consistent with the requirements of GM18-2013.

Therefore, with this reissuance, the DEQ's Groundwater Program Coordinator reviewed the groundwater monitoring data, as well as the well installation logs and current monitoring plan within the context of GM18-2013. The full review is included in the correspondence file, however, the major conclusions were:

- i. Based on the drilling information and scan of the lagoon design, it appears the lagoon is located near the top of the bedrock. In such cases, any release from the lagoon will dominantly drain into the bedrock, rather than through the soil profile on top of the bedrock.

- ii. The installed wells are very shallow, and are prone to influences (ex. road salt, animal/agriculture, etc.), making it hard to interpret the data gathered.
- iii. Bedrock wells, completed within a water bearing fracture zone, would be better able to determine if the lagoon is impacting the underlying aquifer. Four such wells would be able to determine if impacts are occurring, and if so, any leaks have traveled towards the receiving stream.

Therefore, it is staff's professional judgement that the data being provided may not accurately characterize this site and any potential impacts as a result of treatment operations. Groundwater monitoring language has been updated to adhere to the *Guidance Memo for VPDES Permits with Groundwater Monitoring Requirements* (GM18-2013).

It should be noted that Loudoun Water has indicated they have preliminary plans to upgrade this treatment works and thereby remove the lagoon system. Removal of the lagoons as the potential source of groundwater contamination would obviate the need to perform monitoring to evaluate the integrity of the lagoon system. Accordingly, the groundwater monitoring special condition has been modified to include a permitting action which allows Loudoun Water to submit a plan and schedule for removing the lagoon system and avoid upgrading the groundwater monitoring plan. The plan and schedule is to be submitted to DEQ-NRO for review and approval within 180 days of the permit effective date and is to include the following items:

- a. Ensure the lagoons are removed from service as soon as practicable, but no later than December 31, 2025,
- b. Completion of a preliminary engineering report,
- c. Submittal for a Certificate-to-Construct,
- d. Submittal for a Certificate-to-Operate.

21. Other Special Conditions:

- a. 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.
- b. Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200.B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.
- c. O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.
- d. CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct (CTC) prior to commencing construction and to obtain a Certificate to Operate (CTO) prior to commencing operation of the treatment works.
- e. Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200.C., and by the Board for Waterworks and Wastewater Works Operators (18VAC160-30 et seq.) requires licensure of operators. This facility requires a Class III operator.
- f. Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a reliability Class of II.
- g. Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220.D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

- h. Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.
- i. Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2, and 420 through 720 and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.
- j. Treatment Works Closure Plan. This condition establishes the requirement to submit a closure plan for the treatment works if the treatment facility is being replaced or is expected to close. This is necessary to ensure treatment works are properly closed so that the risk of untreated wastewater discharge, spills, leaks and exposure to raw materials is eliminated and water quality maintained. Section §62.1-44.21 requires every owner to furnish when requested plans, specification and other pertinent information as may be necessary to determine the effect of the wastes from his discharge on the quality of state waters, or such other information as may be necessary to accomplish the purpose of the State Water Control Law.
- k. Total Maximum Daily Load (TMDL) Reopener. Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream.

22. Permit Section Part II:

Required by VPDES Regulation 9VAC25-31-190, Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

- a. Special Conditions:
 - Groundwater Monitoring special condition was moved to Section 20.c.
 - Treatment Works Closure Plan and Water Quality Criteria Reopener special conditions are included with this reissuance.
- b. Monitoring and Effluent Limitations:
 - Influent monitoring was removed.
 - Monitoring for nutrients and ammonia was added.
 - Groundwater monitoring language was updated to reflect Guidance Memo No. 18-2013, *VPDES Permits with Groundwater Monitoring Requirements*, and staff's professional judgement.
- c. Other: Pretreatment requirements are included with this reissuance.

24. Variances/Alternate Limits or Conditions:

None.

25. Public Notice Information:

First Public Notice Date: November 22, 2019 Second Public Notice Date: November 29, 2019

Public Notice Information is required by 9VAC25-31-290. All pertinent information is on file and may be inspected and copied by contacting the: DEQ Northern Regional Office; 13901 Crown Court; Woodbridge, VA 22193; Telephone No. (703) 583-3859, caitlin.shipman@deq.virginia.gov. See **Attachment 14** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for

public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. Additional Comments:

Previous Board Action(s):	None.
Staff Comments:	Four days were added to the public comment period to account for State holidays that occurred during the comment period.
State/Federal Agency Comments:	DGIF provided a comment on April 23, 2019, recommending the use of UV disinfection over chlorine disinfection, but does not anticipate this facility to impact threatened or endangered species. See correspondence file for the full comment from DGIF.
Public Comments:	None.
Owner Comments:	Loudoun Water provided comments on September 5, 2019 and November 5, 2019. These comments were addressed during the reissuance process, with Loudoun Water concurring to the draft permit on November 15, 2019. See correspondence file for details.

Waterford Sewage Treatment Plant (VA0060500)

Fact Sheet Attachments:

Attachment 1 – Flow Frequency Determination

Attachment 2 – Facility Schematic

Attachment 3 – Topographic Map

Attachment 4 – Inspection Report

Attachment 5 – Planning Statement

Attachment 6 – Water Quality Criteria / Wasteload Allocation Analysis

Attachment 7 – Ambient pH & Temperature Data

Attachment 8 – Effluent pH & Temperature Data

Attachment 9 – Discharge Monitoring Reports

Attachment 10 – Mixing Analysis

Attachment 11 – Ammonia Limit Calculation

a. 2019 Reissuance

b. 2014 Reissuance

Attachment 12 – Total Residual Chlorine Limit Calculation

Attachment 13 – Dissolved Oxygen Modeling, October 1973

Attachment 14 – Public Notice

Attachment 1 – Flow Frequency Determination

Flow Frequency Determination
Waterford Sewage Treatment Plant (VA0060500)
Revised: August 22, 2019

Catoctin Creek at Taylorstown, VA (Gaging Station #01638480)

Drainage Area at the Gauging Station: 89.5 mi²

Flow Statistic	CFS	MGD
1Q10	0.51	0.33
7Q10	0.64	0.41
30Q10	1.50	0.97
HF1Q10	6.41	4.14
HF7Q10	8.27	5.34
HF30Q10	13.1	8.47
Harmonic Mean	11.0	7.11
30Q5	2.66	1.72

High flow months: December - May

High flow statistics period: April 1, 1972 - March 31, 2007

$$(DA_{\text{Outfall}}/DA_{\text{Gauge}})(Q_{\text{Gauge}}) = Q_{\text{Outfall}}$$

South Fork Catoctin Creek, at Outfall 001:

Drainage area at Outfall 001: 31.98 mi²

Flow Statistic	MGD
1Q10	0.12
7Q10	0.15
30Q10	0.35
HF1Q10	1.48
HF7Q10	1.91
HF30Q10	3.03
Harmonic Mean	2.54
30Q5	0.61

Attachment 2 – Facility Schematic

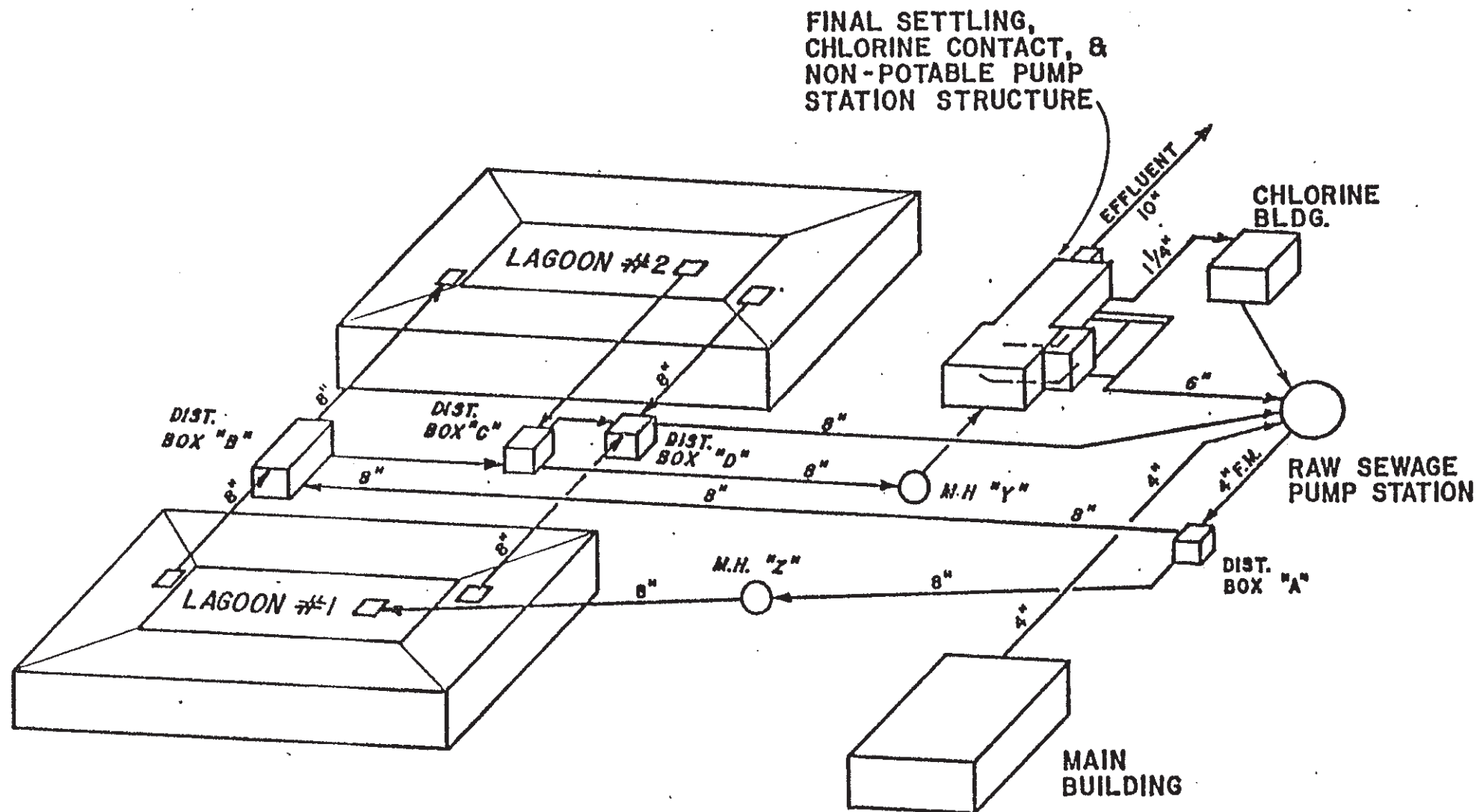
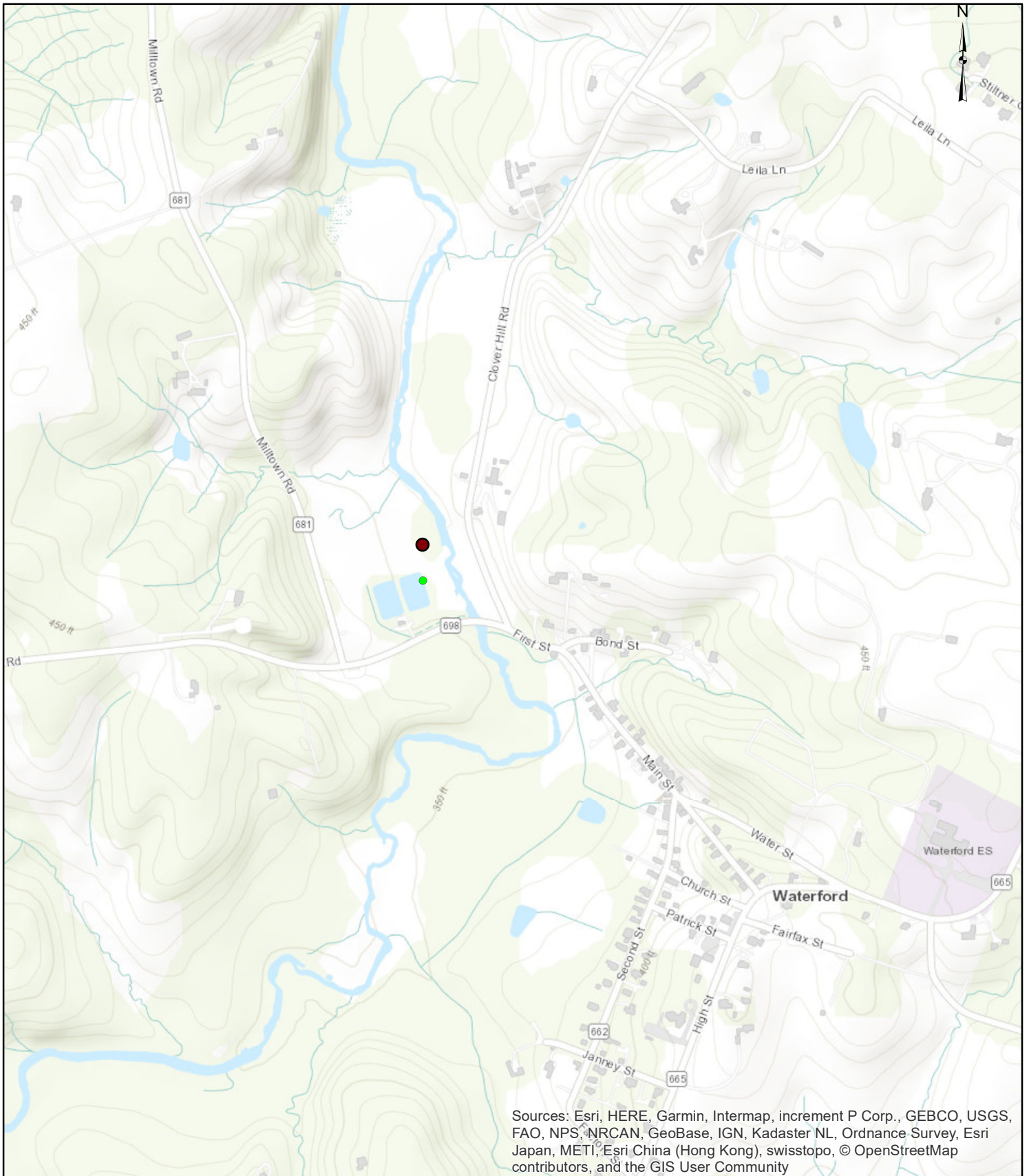


FIG. II. SCHEMATIC FLOW DIAGRAM

Attachment 3 – Topographic Map

Waterford Sewage Treatment Plant



Legend

- VA0060500 Outfall 001
- VA0060500 Waterford Sewage Treatment Plant

Attachment 4 – Inspection Report



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE

13901 Crown Court, Woodbridge, Virginia 22193

(703) 583-3800

www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

July 1, 2019

By email: wdownes@loudounwater.org

Mr. Kinsey Downes
Director, Water Reclamation
Loudoun Water
44771 Loudoun Water Way
P.O. Box 4000
Ashburn, VA 20147

Re: LCSA – Waterford STP – Permit # VA0060500

Dear Mr. Downes:

Attached is a copy of the Inspection Report generated while conducting a Facility Technical Inspection at the Waterford - Sewage Treatment Plant (STP) on May 29, 2019. This letter is not intended as a case decision under the Virginia Administrative Process Act, Va. Code § 2.2-4000 *et seq.* (APA).

Please review the requirements and recommendations addressed in the “Request for Corrective Action”, section and submit in writing, a progress report to this office by August 1, 2019. Your response may be sent either via the US Postal Service or electronically, via E-mail. If you choose to send your response electronically, we recommend sending it as an Acrobat PDF or in a Word-compatible, write-protected format. Additional inspections may be conducted to confirm the facility is in compliance with permit requirements.

If you have any questions or comments concerning this report, please contact Mark Evans at the Northern Regional Office at (703) 583-3811 or by E-mail at Mark.Evans@deq.virginia.gov

Sincerely,

Mark Evans
Environmental Specialist II

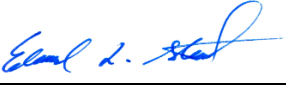
cc: Permit/DMR File;
Water Compliance Manager
Electronic Copy:
Mr. Raymond Kirkpatrick Jr. Rkirkpatrick@loudounwater.org
Mr. Charles Triplett ctriplett@loudounwater.org
Shipman, Caitlin Caitlin.Shipman@deq.virginia.gov

PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0060500	February 12, 2014	Continued on January 14, 2019	February 11, 2019
Facility Name	Address		Telephone Number
Waterford STP	40024 Old Wheatland Road Waterford, VA 20197		--
Owner Name	Address		Telephone Number
Loudoun County Sanitation Authority (LCSA)	44771 Loudoun Water Way, P.O. Box 4000 Ashburn, VA 20147		--
Responsible Official	Title		Telephone Number
Mr. Kinsey Downes	LCSA Director, Water Reclamation		(571) 919-9814
Responsible Operator	Operator Cert. Class/number		Telephone Number
Austin Kirkpatrick	Class 2 / 1965008923		(703) 687-7712
TYPE OF FACILITY:			
DOMESTIC - STP		INDUSTRIAL	
Federal		Major	
Non-federal	X	Minor	X
INFLUENT CHARACTERISTICS: STP		DESIGN:	
Flow		0.058 MGD	
OUTFALL 001 (Wastewater Treatment Plant) EFFLUENT LIMITS (mg/L unless otherwise indicated):			
Parameter	Min.	Avg.	Max.
Flow (MGD)	NA	NL	NL
pH (S.U.)	6.0	NA	9.0
TSS (mg/L; kg/day)	NA	30; 6.6	45; 9.9
BOD5 (mg/L; kg/day)¹	NA	24; 5.3	36; 7.9
E. Coli (#/100 ml)	NA	126	NA
Receiving Stream		South Fork Catoctin Creek	
Basin		Potomac River	
Discharge Point (LAT)		39° 11' 30" N	
Discharge Point (LONG)		77° 37 00" W	

1. Total Residual Chlorine (TRC) after chlorine contact tank and after dechlorination.

**DEQ
WASTEWATER FACILITY
INSPECTION REPORT
PART 1**

FACILITY NAME: Waterford STP	INSPECTION DATE: 05/29/2019
	INSPECTOR: Mark Evans
PERMIT No.: VA0060500	REPORT DATE: 06/03/2019
TYPE OF FACILITY: ☒ Domestic: ☐ Major ☒ Minor ☐ Federal ☒ Non-Federal ☐ Industrial ☐ Major ☐ Minor ☐ Primary ☐ Secondary	
TOTAL TIME SPENT 24 hours w/ travel & report	UNANNOUNCED INSPECTION? ☒ Yes ☐ No
REVIEWED BY / DATE:  6/30/19	
PRESENT DURING INSPECTION: Caitlin Shipman - DEQ and Charles Triplett and Austin Kirkpatrick - Loudoun Water- LCSA	
TYPE OF INSPECTION: ☒ Routine ☐ Compliance/Assistance/Complaint ☐ Re-inspection	
DATE OF LAST INSPECTION: 06/30/16 (CEI)	
POPULATION SERVED: Approx. 275	CONNECTIONS SERVED: Approx. 100

LAST MONTH (April):

Effluent (from DMR):

Avg./Max. Flow: 0.042/0.057 MGD	pH range: 7.0 S.U. to 7.7 S.U.	D.O. min: 9.8 mg/L
--	---------------------------------------	---------------------------

1. Data Verified in Preface:	☒ Updated ☐ No change
2. Has there been any new construction? • If so, were plans and specifications approved? DEQ Approval Date: Not Applicable (NA)	☐ Yes ☒ No

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of licensed operators: Comments:		I: <u>0</u> II: <u>2</u> III: <u>0</u> IV: <u>0</u> Trainee: <u>1</u>
2. Hours per day plant is manned: Comments: 5 days/week and days when discharging.		5 hours a day
3. Describe adequacy of staffing.	☒ Good	☐ Average ☐ Poor
4. Is there an established and adequate program for training personnel? Comments: On-the-job training, VA Rural Water Association guides, and VA Tech. Short School		☒ Yes ☐ No
5. Are preventive maintenance task schedules being met? Comments:		☒ Yes ☐ No
6. Describe the adequacy of the training program. Comments:	☐ Good	☒ Average ☐ Poor
7. Does the plant experience any organic or hydraulic overloading? Comments:		☐ Yes ☒ No
8. Has there been any bypassing or overflows since the last inspection? Comments:		☐ Yes ☒ No
9. Is the standby generator (including power transfer switch) operational and exercised regularly? Comments:		☒ Yes ☐ No
10. Is the plant alarm system operational and tested regularly? Comments:		☒ Yes ☐ No
11. How often is the: a. Standby generator exercised? b. Power Transfer Switch? c. Alarm System? Comments: 9 operators are on the Verbatim™ auto-dialer system.		a. Weekly b. Weekly c. Weekly
12. When was the cross connection control device last tested on the potable water service?		NA
13. Is sludge disposed of in accordance with the approved sludge management plan? Comments: Approximately 2,000 gallons of sludge is transported once/year to the Broad Run Water Reclamation Facility (VA0091383)		☒ Yes ☐ No
14. Is septage received? If so, is septage loading controlled, and are appropriate records maintained? Comments: NA		☐ Yes ☒ No ☐ Yes ☐ No
Overall Appearance of Plant	☒ Good	☐ Average ☐ Poor

(B) PLANT RECORDS

1. Which of the following records does the plant maintain? a. Operational Logs for each unit process b. Instrument maintenance and calibration c. Mechanical equipment maintenance d. Industrial waste contribution (Municipal Facilities) Comments:		a. ☒ Yes ☐ No b. ☒ Yes ☐ No c. ☒ Yes ☐ No d. ☐ Yes ☒ No
2. What does the operational log contain? ☒ Visual observations ☒ Flow measurement ☒ Laboratory results ☒ Process adjustments ☐ Control calculations ☐ Other (specify) Comments:		
3. What do the mechanical equipment records contain? ☒ As built plans and specs ☒ Spare parts inventory ☒ Manufacturer's instructions ☒ Equipment/parts suppliers ☒ Lubrication schedules ☐ Other (specify)		

Comments:	
4. What do the industrial waste contribution records contain (Municipal Only)? ☐ Waste Characteristics ☐ Locations and discharge types ☐ Impact on plant ☐ Other (specify) Comments: NA	
5. Which of the following records are kept at the plant and available to personnel? ☒ Equipment maintenance records ☒ Operational Log ☐ Industrial contributor records ☒ Instrumentation records ☒ Sampling and testing records Comments:	
6. Records not normally available to plant personnel and their location: All records available onsite.	
7. Were the records reviewed during the inspection?	☒ Yes ☐ No
8. Are the records adequate and the O & M Manual current?	☒ Yes ☐ No
9. Are the records maintained for the required 3-year time period?	☒ Yes ☐ No

(C) SAMPLING

1. Do sampling locations appear to be capable of providing representative samples? Comments:	☒ Yes ☐ No
2. Do sample types correspond to those required by the VPDES permit? Comments:	☒ Yes ☐ No
3. Do sampling frequencies correspond to those required by the VPDES permit? Comments:	☒ Yes ☐ No
4. Are composite samples collected in proportion to flow? Comments:	☒ Yes ☐ No
5. Are composite samples refrigerated during collection? Comments:	☒ Yes ☐ No
6. Does plant maintain required records of sampling? Comments:	☒ Yes ☐ No
7. Does plant run operational control tests? Comments:	☒ Yes ☐ No

NR = Not Reviewed

(D) TESTING

1. Who performs the testing?	☒ Plant ☒ Central Lab ☐ Commercial Lab
Name: Loudoun Water Laboratory	
If plant performs any testing, complete 2-4. Plant performs pH, DO, and TRC	
2. What method is used for chlorine analysis?	DPD Colorimetric
3. Does plant appear to have sufficient equipment to perform required tests?	☒ Yes ☐ No
4. Does testing equipment appear to be clean and/or operable?	☒ Yes ☐ No
Comments: See laboratory inspection report below	

(E) FOR INDUSTRIAL FACILITIES WITH TECHNOLOGY BASED LIMITS ONLY

1. Is the production process as described in the permit application? (If no, describe changes in comments)?	☐ Yes ☐ No
2. Do products and production rates correspond as provided in the permit application? (If no, list differences in comments.)	☐ Yes ☐ No
3. Has the State been notified of the changes and their impact on plant effluent? Date:	☐ Yes ☐ No
Comments: NA	

Problems identified at last inspection: 06/30/16	Corrected?
No major problems were identified.	☐ Yes ☐ No

SUMMARY

Prior to this inspection, DEQ reviewed the permit factsheet, which states: “The Waterford Wastewater Treatment Plant (WWTP) is an enhanced aerated lagoon facility designed to treat an average of 58,000 GPD, but normally treats about 18,000 GPD; discharge is intermittent, with up to 28-32 discharge events per year on a weekly basis. Each weekly discharge event typically averages about 42,000 GDP. Discharge during the winter is limited to occasional events to maintain pond level. Treatment consists of the following stages: aerated lagoon, secondary clarification enhanced with aluminum sulfate addition, tablet chlorination and dechlorination, and post aeration. The facility serves a population of about 275 people.

The wastewater enters the facility by gravity sewer discharging to an influent sewage pump station. The station contains two submersible sewage pumps that discharge through a 4-inch force main to Distribution Box (D-Box) A. The wastewater flows from D-Box A by 8-inch gravity sewer to the aerated lagoons.

There are two aerated lagoons, normally operating in series, to provide the initial stage of secondary treatment. Wastewater enters one end of Lagoon 1 from D-Box A. Lagoon 1 provides about 8.25 days of detention for treatment at design flow. At the opposite end of lagoon 1 is an 8-inch outlet that allows the wastewater to flow by gravity, through D-Box B to Lagoon 2. Lagoon 2 provides another 8.25 days of detention to complete biological treatment. Each lagoon has a normal water surface of 194 feet by 120 feet at a depth of 10 feet. The lagoons have sloped sides, and the earthen bottom and sides are sealed with bentonite clay. Aeration is provided by air diffusion through a grid of 1/2- inch, slotted, polyethylene tubing laid in rows across the lagoon bottom and fed by a 4-inch PVC header. Air is supplied by two, positive displacement blowers.

After biological treatment the wastewater exits Lagoon 2 through an 8-inch-line and flows by gravity to D-Box C. Aluminum sulfate (alum) is added at this point in the process and the wastewater continues its flow by gravity to the two secondary clarifiers. The incoming flow is split between the clarifiers and any solids escaping from the lagoons are settled out to complete secondary treatment. Each clarifier is 10-foot by 10-foot square with a hopper bottom and provides about 4.2 hours of detention at design flow. Solids that settle to the hopper bottoms are drained off periodically to the influent pump station.

After pond treatment and clarification, the wastewater is disinfected in the two chlorine contact tanks. Disinfection is achieved using a 4-tube, tablet feed system that allows calcium hypochlorite tablets to dissolve into the waste stream as it flows through the feeder. The tanks are fitted with over/under baffles to prevent short circuiting. Each tank has a volume of 2100 gallons and provides about 50 minutes of detention time at design flow. Following the chlorine contact tank is a post aeration and dechlorination tank. Water leaving the chlorine contact tank passes through a 4-tube tablet feeder that provides a dose of sodium bi-sulfite to de-chlorinate the wastewater prior to discharge. When a discharge event is initiated the post aeration air diffuser in the tank is manually turned on. Sampling is conducted after the dechlorination chamber as the flow enters the outfall line. After all treatment, flow is discharged from the plant through a 10-inch diameter pipe (Outfall 001) into the South Fork of Catoctin Creek using a shore-based headwall with a backwater flap valve.”

Mr. Evans and Caitlin Shipman (hereinafter DEQ) arrived at 10:30 am, met with Mr. Kirkpatrick and Mr. Triplett (hereinafter the operators) and explained that the purpose of the visit was a technical inspection to observe the facility’s level of compliance with its discharge permit.

DEQ asked the operators the general and process specific questions presented on standard DEQ inspection checklists and about the unit processes at the facility. The responses to the general questions are shown above and the unit process checklists are shown on pages 8 through 15 of this report. DEQ also inspected

the on-site field laboratory and observed as Mr. Kirkpatrick calibrated the field instruments and conducted in-situ pH and dissolved oxygen measurements on the facility's effluent (see pages 19 through 27 of this report). The field laboratory inspection resulted in the following observations:

- **The dissolved oxygen concentration at Outfall 001 was measured at 6.68 standard units (S.U.), which rounds to 6.7 mg/L;**
- **DEQ requested certificates of analyses (CoA) data (including bench and log information) for all the samples collected to support the DMRs for the months of February, March, and April of 2019; however, the facility provided only the laboratory's general Certificate and Scope for the analyses they are permitted to conduct, and DEQ has not received the requested information as of the date of this report;**
- **There were no records on the site for the operators to reference the NIST annual thermometer verification dates, offset values, and validation inspection temperatures for the pH and DO instruments and sample refrigerators #1 and #2 (these records were received by DEQ after the inspection).**

+

After going through the checklists, the operators and DEQ walked through the facility's main processes. DEQ observed a clean and well-run facility, as reflected in **photos 1 through 8**.

DEQ departed at approximately 12:30 pm.

REQUEST for CORRECTIVE ACTION

Recommendation 1: Provide DEQ with a plan to increase the dissolved oxygen concentration at Outfall 001 and revise the May DMR to reflect 6.7 mg/L of dissolved oxygen, as observed during the inspection.

Basis for recommendation1: Permit No. VA0060500, Part I.A., "Effluent Limitations and Monitoring Requirements,," states: "The minimum Dissolved Oxygen concentration is 6.8 mg/L"

Recommendation 2: Provide certificates of analyses (CoA) data (including bench and log information) for all the samples collected to support the DMRs for the months of February, March, and April of 2019.

Basis for recommendation 2: Permit No. VA0060500, Part I.D., "Duty to Provide Information," states: "The permittee shall furnish to the Department, within a reasonable time, any information which the Board may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Board may require the permittee to furnish, upon request, such plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from this discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit."

Recommendation 3: Provide stickers on the pH and DO instruments and sample refrigerators #1 and #2 to display NIST annual thermometer verification dates, offset values, and validation inspection temperatures.

Basis for recommendation 3: Permit No. VA0060500, Part II.Q., “Proper Operation and Maintenance,” states: “The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes effective plant performance, adequate funding, adequate staffing, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of this permit.”

NOTES and COMMENTS:

DEQ requested that the facility identify which EPA approved method is used for pH analyses, and the facility responded that it uses EPA-approved Hach Method 815; DEQ noted that the facility most likely meant Hach Method 8156. Please confirm or revise the facility’s response.

UNIT PROCESS: Sewage Pumping

1. Name of station: **Plant Influent**

2. Location (if not at STP):

3. Following equipment operable:

- | | | |
|----------------------|---|------------------------------|
| a. all pumps | ☒ Yes | ☐ No* |
| b. ventilation | ☒ Yes | ☐ No* |
| c. control system | ☒ Yes | ☐ No* |
| d. sump pump | ☒ Yes | ☐ No* |
| e. seal water system | ☒ Yes | ☐ No* |

4. Reliability considerations:

- | | | | |
|--|--|--|--------------------------------|
| a. Class | ☐ I | ☒ II | ☐ III |
| b. Alarm system operable: | ☒ Yes | ☐ No* | |
| c. Alarm conditions monitored: | | | |
| 1. high water level | ☒ Yes | ☐ No* | |
| 2. high liquid level in dry well | ☒ Yes | ☐ No | ☐ NA |
| 3. main electric power | ☒ Yes | ☐ No | ☐ NA |
| 4. auxiliary electric power | ☒ Yes | ☐ No* | ☐ NA |
| 5. failure of pump motors to start | ☒ Yes | ☐ No | ☐ NA |
| 6. test function | ☒ Yes | ☐ No* | |
| 7. other | ☐ Yes | ☐ No | |
| d. Backup for alarm system operational: | ☐ Yes | ☒ No | ☐ NA |
| e. Alarm signal reported to (identify): 9 operators | | | |
| f. Continuous operability provisions: | | | |
| ☐ generator | ☒ two sources of power | | |
| ☐ portable pump | ☐ One day storage | | ☐ other |
5. Does station have bypass:
- | | | | |
|------------------------------|-------------------------------|--|--|
| a. evidence of bypass use | ☐ Yes* | ☒ No | |
| b. can bypass be disinfected | ☐ Yes* | ☐ No | ☒ NA |
| c. can bypass be measured | ☐ Yes | ☐ No | ☒ NA |

6. How often is station checked? **Daily**

7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

UNIT PROCESS: Ponds/Lagoons

1. Type:	☒ Aerated	☐ Unaerated	☐ Polishing	
2. No. of cells:	2	In operation:	2	
3. Color:	☒ Green	☐ Brown	☐ L. Brown	☐ Grey ☐ Other:
4. Odor:	☐ Septic*	☐ Earthy	☒ None	☐ Other:
5. System operated in:	☒ Series	☐ Parallel	☐ NA	
6. If aerated, are lagoon contents mixed adequately?	☒ Yes	☐ No*	☐ NA	
7. If aerated, is aeration system operating properly?	☒ Yes	☐ No*	☐ NA	
8. Evidence of following problems:				
a. vegetation in lagoon or dikes	☐ Yes*	☒ No		
b. rodents burrowing on dikes	☐ Yes*	☒ No		
c. erosion	☐ Yes*	☒ No		
d. sludge bars	☐ Yes*	☒ No		
e. excessive foam	☐ Yes*	☒ No		
f. floating material	☐ Yes*	☒ No		
9. Fencing intact:	☒ Yes	☐ No*		
10. Grass maintained properly:	☒ Yes	☐ No		
11. Level control valves working properly:	☒ Yes	☐ No*		
12. Effluent discharge elevation:	☐ Top	☐ Middle	☒ Bottom	
13. Freeboard:	>3 ft.			
14. Appearance of effluent:	☒ Good	☐ Fair	☐ Poor	
15. General condition:	☒ Good	☐ Fair	☐ Poor	
16. Are monitoring wells present?	☒ Yes	☐ No		
Are wells adequately protected from runoff?	☒ Yes	☐ No*	☐ NA	
Are caps on and secured?	☒ Yes	☐ No*	☐ NA	

Comments:

UNIT PROCESS: Sedimentation

☐ Primary☒ Secondary☐ Tertiary1. Number of units **2**In operation: **2**

2. Proper flow distribution between units:

☐ Yes☐ No*☐ NA

3. Signs of short circuiting and/or overloads:

☐ Yes☒ No

4. Effluent weirs level:

☒ Yes☐ No*

Clean:

☒ Yes☐ No*

5. Scum collection system working properly:

☒ Yes☐ No*☐ NA

6. Sludge collection system working properly:

☒ Yes☐ No*

7. Influent, effluent baffle systems working properly:

☒ Yes☐ No*

8. Chemical addition:

☒ Yes☐ NoChemicals: **Alum**

9. Effluent characteristics:

Clear

10. General condition:

☒ Good☐ Fair☐ Poor

Comments: **The sludge in the clarifiers is pumped back to Pond #1 three times per day, and all the sludge in the clarifiers (approximately 2,000 gallons) is cleaned out once per year and transported to the Broad Run Water Reclamation Facility (VA0091383).**

UNIT PROCESS: Chlorination

- | | | | | |
|--|----|---|-------------------------------|-------------------------------|
| 1. No. of chlorinators: | 2 | In operation: | 2 | |
| 2. No. of evaporators: | NA | In operation: | NA | |
| 3. No. of chlorine contact tanks: | 2 | In operation: | 2 | |
| 4. Proper flow distribution between units: | | ☒ Yes | ☐ No* | ☐ NA |
| 5. How is chlorine introduced into the wastewater? | | | | |
| | | ☐ Perforated diffusers | | |
| | | ☐ Injector with single entry point | | |
| | | ☒ Other Tablet feeders | | |
| 6. Chlorine residual in basin effluent: | | 3.8 mg/L | | |
| 7. Applied chlorine dosage: | | Use tablets (refill as needed) | | |
| 8. Contact basins adequately baffled: | | ☒ Yes | ☐ No* | |
| 9. Adequate ventilation: | | | | |
| a. cylinder storage area | NA | ☐ Yes | ☐ No* | |
| b. equipment room | NA | ☐ Yes | ☐ No* | |
| 10. Proper safety precautions used: | | ☒ Yes | ☐ No* | |
| 11. General condition: | | ☒ Good | ☐ Fair | ☐ Poor |

Comments:

UNIT PROCESS: Dechlorination

1. Chemical used: ☐ Sulfur Dioxide ☐ Bisulfite ☒ Other
2. No. of sulfonators: 0 In operation: 0
3. No. of evaporators: 0 In operation: 0
4. No. of chemical feeders: 0 In operation: 0
5. No. of contact tanks: 2 In operation: 2
6. Proper flow distribution between units: ☒ Yes ☐ No* ☐ NA
7. How is chemical introduced into the wastewater?
☐ Perforated diffusers
☐ Injector with single entry point?
☒ Other **Tablet feeders**
8. Control system operational: ☒ Yes ☐ No*
a. residual analyzers: ☒ Yes ☐ No*
b. system adjusted: ☐ Automatic ☒ Manual ☐ Other:
9. Applied dechlorination dose: **Use tablets (refill as needed)**
10. Chlorine residual in basin effluent: **0.0 mg/L**
11. Contact basins adequately baffled: ☒ Yes ☐ No ☐ NA
12. Adequate ventilation:
a. cylinder storage area: **NA** ☐ Yes ☐ No*
b. equipment room: **NA** ☐ Yes ☐ No*
13. Proper safety precautions used: ☒ Yes ☐ No*
14. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

UNIT PROCESS: Post Aeration

1. Number of units: **1** In operation: **1**
2. Proper flow distribution between units: ☐ Yes ☐ No* ☒ NA
3. Evidence of following problems:
- | | | | |
|---------------------------------|-------------------------------|--|-----------------------------|
| a. dead spots | ☐ Yes* | ☒ No | |
| b. excessive foam | ☐ Yes* | ☒ No | |
| c. poor aeration | ☐ Yes* | ☒ No | |
| d. mechanical equipment failure | ☐ Yes* | ☒ No | ☐ NA |
4. How is the aerator controlled? ☒ Manual ☐ Time clock ☐ Continuous ☐ Other ☐ NA
5. What is the current operating schedule? **Manually turned on when a discharge is occurring**
6. Step weirs level: ☒ Yes ☐ No ☐ NA
7. Effluent D.O. level: **6.68 S.U.**
8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments: The D.O. reading during the inspection was 6.68 S.U., which is below the minimum limit of 6.8 S.U.

UNIT PROCESS: Flow Measurement

☐ Influent ☐ Intermediate ☒ Effluent

1. Type measuring device: **Mag meter**

2. Present reading: **Not recorded**

3. Bypass channel: ☐ Yes ☒ No
Metered: ☐ Yes ☐ No ☒ NA

4. Return flows discharged upstream from meter: ☐ Yes ☒ No
Identify:

5. Device operating properly: ☒ Yes ☐ No *

6. Date of last calibration: **Not recorded**

7. Evidence of following problems:

a. obstructions ☐ Yes* ☒ No
b. grease ☐ Yes* ☒ No

8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

UNIT PROCESS: Effluent/Plant Outfall

1. Type Outfall: ☒ Shore based ☐ Submerged
2. Type if shore based: ☐ Wingwall ☒ Headwall ☐ Rip Rap
3. Flapper valve: ☒ Yes ☐ No ☐ NA
4. Erosion of bank: ☐ Yes* ☒ No ☐ NA
5. Effluent plume visible? ☐ Yes* ☒ No
6. Condition of outfall and supporting structures: ☒ Good ☐ Fair ☐ Poor
7. Final effluent, evidence of following problems:
- a. oil sheen ☐ Yes* ☒ No
 - b. grease ☐ Yes* ☒ No
 - c. sludge bar ☐ Yes* ☒ No
 - d. turbid effluent ☐ Yes* ☒ No
 - e. visible foam ☐ Yes* ☒ No
 - f. unusual color ☐ Yes* ☒ No

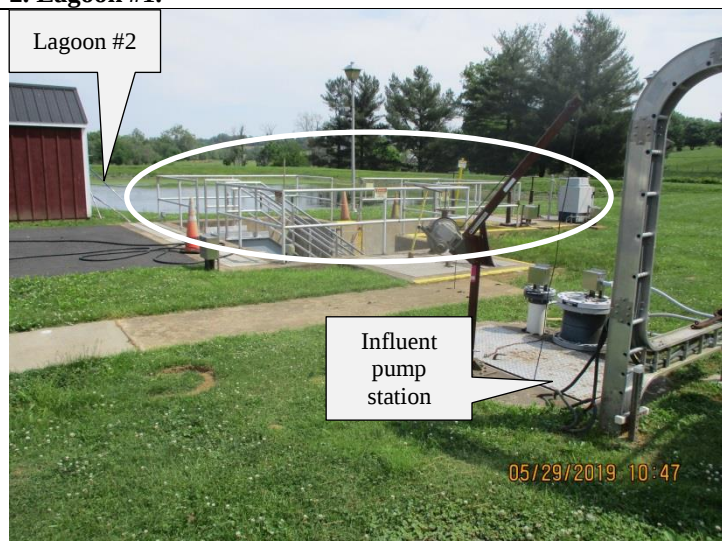
Comments: **Clear effluent and clear receiving stream.**

PHOTOS



1. Influent pump station (white circle).

2. Lagoon #1.



3. Lagoons #1 and #2.

4. Unit containing clarifiers, chlorination and dechlorination tablets, and a post-aeration basin (white circle).



5. Two clarifiers at the base of the steps of the structure shown in photo 4.

6. Looking from the location of photo 5 toward the chlorine contact, dechlorination and post-aeration areas.



7. Close-up view of dechlorination tablet feeders.

8. Outfall 001.

Photos and layout by Mark Evans

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
LABORATORY INSPECTION REPORT
11/2014

PERMIT #: VA0060500	INSPECTION DATE: 05/29/2019	PREVIOUS INSP. DATE: 06/30/16	PREVIOUS EVALUATION: No deficiencies	TIME SPENT: 2 hours w/ travel & report
NAME/ADDRESS OF FACILITY: Waterford STP 40024 Old Wheatland Road Waterford, VA 20197		FACILITY CLASS: ☐ MAJOR ☒ MINOR ☐ MINOR (Small) ☐ VPA	FACILITY TYPE: ☒ MUNICIPAL ☐ INDUSTRIAL ☐ FEDERAL	UNANNOUNCED INSPECTION? ☒ YES ☐ NO
				FFY-SCHEDULED INSPECTION? ☐ YES ☒ NO
INSPECTOR(S): Mark Evans		REVIEWER(S): 	PRESENT AT INSPECTION: Caitlin Shipman - DEQ and Charles Triplett and Austin Kirkpatrick - Loudoun Water- LCSA	

LABORATORY EVALUATION	DEFICIENCIES?	
	Yes	No
LABORATORY RECORDS	☐	☒
GENERAL SAMPLING AND ANALYSIS	☐	☒
pH PROCEDURE	☐	☒
TOTAL RESIDUAL CHLORINE PROCEDURE	☐	☒
DISSOLVED OXYGEN PROCEDURES	☐	☒
TEMPERATURE PROCEDURES	☐	☒

VELAP CERTIFICATION (on site Environmental Laboratory)			Yes	No
Does the laboratory have VELAP certification (interim or final)?			☐	☒
– Document the laboratory's VELAP laboratory number:				
– Document the effective date of the VELAP certification:				
– Document the expiration date of the VELAP certification:				
– List the certified parameters:				
VELAP ACCREDITATION (Commercial Environmental Laboratory)			Yes	No
IS A VELAP ACCREDITED LAB USED FOR OTHER PERMIT REQUIRED ANALYSES? VELAP#, LAB NAME, ADDRESS and LIST PARAMETERS:			☒	☐
VELAP #	LAB NAME ¹	ADDRESS	PARAMETERS	
450115	Loudoun Water Laboratory	44961 Loudoun Water Way Ashburn, VA 20146	Ammonia, BOD ₅ , TSS, and <i>E.coli</i>	
IF PERMIT REQUIRED SAMPLE ANALYSIS IS PERFORMED AT ANOTHER LOCATION, ARE SHIPPING PROCEDURES ADEQUATE?			☒	☐
COPIES: ☒ DEQ - RO; ☐ Owner, ☐ Other:				

1. Provide the names of all laboratories that contributed analytical results to DMRs for the inspected facility.

LABORATORY RECORDS SECTION¹
LABORATORY RECORDS INCLUDE THE FOLLOWING:

☒	SAMPLING DATE	☒	ANALYSIS DATE	☐	CONT MONITORING CHART
☒	SAMPLING TIME	☒	ANALYSIS TIME	☒	INSTRUMENT CALIBRATION
☒	SAMPLE LOCATION	☒	TEST METHOD	☒	INSTRUMENT MAINTENANCE
				☐	CERTIFICATE OF ANALYSIS

WRITTEN INSTRUCTIONS INCLUDE THE FOLLOWING:

☐	SAMPLING SCHEDULES	☐	CALCULATIONS	☐	ANALYSIS PROCEDURES
--------------------------	--------------------	--------------------------	--------------	--------------------------	---------------------

	YES	NO	N/A
DO ALL ANALYSTS INITIAL THEIR WORK?	☒	☐	☐
DO BENCH SHEETS (or LOG BOOK) INCLUDE ALL INFORMATION NECESSARY TO DETERMINE RESULTS? <u>Certificates of Analysis requested but not provided prior to this report.</u>	☐	☐	☐
IS THE DMR COMPLETE AND CORRECT? LIST MONTH(S) REVIEWED: Records for the months of February, March, and April of 2019.	☒	☐	☐
ARE ALL MONITORING VALUES REQUIRED BY THE PERMIT REPORTED? See above.	☒	☐	☐
DOES CHAIN OF CUSTODY DOCUMENT PROPER SAMPLE PRESERVATION WAS MET? See footnote ¹	☒	☐	☐
WHEN THE CERTIFICATE OF ANALYSIS CONTAINS FLAGGED DATA IS THE 'FLAG' REPORTED ON THE DMR? <u>Certificates of Analyses requested but not provided prior to this report.</u>	☐	☐	☒

GENERAL SAMPLING AND ANALYSIS SECTION

	YES	NO	N/A
ARE SAMPLE LOCATIONS ACCORDING TO PERMIT REQUIREMENTS?	☒	☐	☐
ARE PERMIT REQUIRED SAMPLE COLLECTION PROCEDURES APPROPRIATE?	☒	☐	☐
ARE EFFLUENT SAMPLES REPRESENTATIVE OF THE MONITORED ACTIVITY?	☒	☐	☐
ARE PERMIT REQUIRED COMPOSITE SAMPLES FLOW PROPORTIONAL? NOTE: Equal volume composite aliquots are acceptable <u>if the instantaneous flow is within $\pm 10\%$ of the daily average flow during the monitoring period.</u> Some permits specify how the composite is to be taken (e.g., 5G/8HC).*	☒	☐	☐
IS COLLECTION SAMPLE EQUIPMENT ADEQUATE?	☒	☐	☐
IS FLOW MEASUREMENT ACCORDING TO PERMIT REQUIREMENTS?	☒	☐	☐

**DEPARTMENT OF ENVIRONMENTAL QUALITY – WATER DIVISION
LABORATORY INSPECTION REPORT SUMMARY**

FACILITY NAME:	Waterford STP	Permit #:	VA0060500	INSPECTION DATE:	05/29/2019
LABORATORY EVALUATION		☒	No required actions at this time		
		☐	REQUIRED CORRECTIVE ACTION(s) IDENTIFIED		
SUMMARY of REQUEST FOR CORRECTIVE ACTION					
Lab Records					
Laboratory Records section deficiency and required action:					
None					
General Sampling and Analysis					
General Sampling and Analysis section deficiency and required action:					
None					
pH Analysis					
pH deficiency and required action:					
None					
TRC Analysis					
TRC deficiency and required action:					
None					
D.O. Analysis					
D.O. deficiency and required action: D.O. during the inspection was measured at 6.7 mg/L, which is below the limit of 6.8 mg/L; the facility operators should develop and execute a plan to increase the D.O. of the effluent.					
None					
Temperature Analysis					
Temperature deficiency and required action:					
None					
OTHER – Comments or Observations					
None					

ANALYST:	Austin Kirkpatrick	VPDES NO	VA0060500
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Meter: **HQ40d**

Parameter: Hydrogen Ion (pH)
Method: Electrometric (3/2015)

METHOD OF ANALYSIS¹

☐	21 st Edition of Standard Methods (SM 21) – 4500-H ⁺ B-2000 (SM 21 pH)
☐	22 nd Edition of Standard Methods (SM 22), or Online Editions of Standard Methods – 4500-H ⁺ B-2011 (SM 22 pH)

pH is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]

- 1) Is a certificate of operator competence or initial demonstration of capability available for each analyst/operator performing this analysis? **NOTE:** Analyze 4 samples of known pH; you may use an external source of buffers or other known standards (different lot/manufacturer than buffers used to calibrate meter). Recovery for each of the 4 samples must be +/- 0.2 SU of the known concentration of the sample or within "Acceptable Range" specified by the PT provider. [SM 1020 B.1] **NOTE: The same pH buffer [values] used for calibration of the instrument can be used as LCS if from a different source or different lot.**
- 2) **IF** a replicate sample is analyzed is there a written procedure for which result will be reported on DMR (Sample or Replicate) and is this procedure being followed? [DEQ – based on EPA Good Laboratory Practices Standards] **NA**
- 3) Is a Laboratory Control Sample (LCS) tested at least annually and are results within acceptance criteria? [SM 21 B.2 or SM 22 1020 B.3.] **NOTE:** LCS should be a purchased Proficiency Test (PT) sample or a different buffer other than ones used for calibration of the meter [with a ±0.2 SU acceptance range or within "Acceptable Range" specified by the PT provider].. **NOTE: The same pH buffer [values] used for calibration of the instrument can be used as LCS if from a different source or different lot.**
- 4) Is the electrode in good condition (no chloride precipitate, scratches, deterioration, etc.)? [SM 21 pH or SM 22 pH 2.b./c. and 5.b.]
- 5) Is electrode storage solution in accordance with manufacturer's instructions? [SM 21 pH or SM 22 pH 4.a. and Mfr.]
- 6) Is meter calibrated on at least a daily basis using three buffers all of which are at the same temperature? [SM 21 pH or SM 22 pH 4.a.] **NOTE:** Start with Buffer 7 unless manufacturer's instructions state otherwise. **[NOTE: If meter is not capable of 3 buffer calibration use 2 buffers bracketing the expected sample pH and then measure a 3rd buffer (the measurement value recorded must be ±0.1 SU), and then reread and record value of buffer 7 to ensure ±0.1 SU.]**
- 7) After calibration, is a buffer analyzed as a check sample to verify that calibration is correct? Verification measurement should be within +/- 0.1 SU. [SM 21 1020 B 10.c. or SM 22 1020 B 11.c.]
- 8) Is calibration verification measurement repeated with every 10 samples and at the end of a series of samples? Verification measurement should be within +/- 0.1 SU. [SM 21 pH or SM 22 pH 4020 B 2.b.] **NOTE:** Not applicable if pH meter is calibrated before taking any measurement (e.g., if operator monitors daily pH at more than one facility and calibrates before each measurement). **NA**
- 9) Do the buffer solutions appear to be free of contamination or growths? [SM 21 pH or SM 22 pH 3.a.]
- 10) Are buffer solutions within the listed shelf-life or have they been prepared within the last 4 weeks? [SM 21 pH or SM 22 pH 3.a.]
- 11) Is the cap or sleeve covering the access hole on the reference electrode removed when measuring pH? [Mfr.]

Y	N
☒	☐
☐	☐
☒	☐
☒	☐
☒	☐
☒	☐
☒	☐
☒	☐
☒	☐
☒	☐

- 12) Is sample analyzed within 15 minutes of collections? [40 CFR Part 136]
- 13) Is the electrode rinsed and then blotted dry between reading solutions (Disregard if a portion of the next sample analyzed is used as the rinsing solution.)? [SM 21 pH or SM 22 pH 4.a and 4.b]
- 14) Is the sample stirred gently at a constant speed during measurement? [SM 21 pH or SM 22 pH 4.b.]
- 15) Does the meter hold a steady reading after reaching equilibrium? [4.b.]

☒	☐
☒	☐
☒	☐
☒	☐

Comments referenced to checklist items above:

None

Other comments:

The pH meter was calibrated successfully by Austin Kirkpatrick. pH measurements were made in-situ, and the pH during the inspection was measured at 7.16 standard units (S.U.).

1. DEQ requested that the facility identify which EPA approved method is used for pH analyses, and the facility responded that it uses EPA-approved Hach Method 815; DEQ noted that the facility most likely meant Hach Method 8156.

ANALYST:	Austin Kirkpatrick	VPDES NO	VA0060500
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Meter: **HQ40d**

Parameter: Dissolved Oxygen
Method: Membrane Electrode (11/2014)

METHOD OF ANALYSIS:¹

☐	21 st Edition of Standard Methods (SM 21) – 4500-O G-2001 (SM 21 DO)
☐	22 nd of Standard Methods, or Online Editions of Standard Methods (SM 22) – 4500-O G-2011 (SM 22 DO)

<i>Dissolved Oxygen (D.O.) is a method-defined analyte so modifications are not allowed. [40 CFR Part 136.6]</i>		Y	N
1)	Is a certificate of operator competence or initial demonstration of capability available for <u>each analyst/operator</u> performing this analysis? NOTE: Analyze 4 samples of air-saturated water. Recovery for each of the 4 samples must be +/- 4% of the calculated oxygen saturation for the altitude/barometric pressure and temperature of the samples. {Alternatively analyze 4 samples of water of known concentration (verified by iodometric titration procedure SM 21 or SM 22 4500-O C). Instrument measurements must agree within +/-0.1 mg/L of verified concentration.} [SM 21 or SM 22 1020 B.1 and 4020 B.1]	☒	☐
2)	Are calibration results (mg/L) within $\pm 4\%$ of the barometric (or altitude) corrected oxygen saturated water value? [SM 21 B.2 or SM 22 1020 B.2.]	☒	☐
3)	If samples are collected, is collection carried out with a minimum of turbulence and air bubble formation and is the sample bottle allowed to overflow several times its volume? [SM 21 DO or SM 22 B 3.]	In situ	
4)	Are meter and electrode operable and providing consistent readings? [SM 21 DO G 2. or SM 22 DO G 2.]	☒	☐
5)	Is membrane in good condition without trapped air bubbles? NOTE: No air bubbles $\geq 1/8$ inch (total area of all bubbles). [SM 21 DO G 3.b. or SM 22 DO G 3.b.]	☒	☐
6)	Is correct filling solution used in electrode? [Mfr.]	☒	☐
7)	Are water droplets shaken off the membrane prior to calibration? [Mfr.]	☒	☐
8)	Is meter calibrated before use or at least daily? [Mfr. & SM 21 1020 B 10.a. or SM 22 1020 B 11.a]	☒	☐
9)	Is calibration procedure performed according to manufacturer's instructions? [Mfr.]	☒	☐
10)	Is sample stirred during analysis (or is there sufficient flow across probe's membrane surface)? [SM 21 DO or SM 22 DO G 3.b. and Mfr.]	☒	☐
11)	Is the sample analysis procedure performed according to manufacturer's instructions? [Mfr.]	☒	☐
12)	Is meter stabilized before reading D.O.? [Mfr.]	☒	☐
13)	Is electrode stored according to manufacturer's instructions? [Mfr.]	☒	☐

Comments referenced to checklist items above:

None

Other comments:

The D.O. meter was calibrated successfully by Austin Kirkpatrick. D.O. measurements were made in-situ, and the D.O. during the inspection was measured at 6.68 mg/L (below the limit of 6.8 mg/L).

1. DEQ requested that the facility identify which EPA approved method is used for D.O. analyses, and the facility responded that it uses EPA-approved Hach LDO Method 10360.

ANALYST:	Austin Kirkpatrick	VPDES NO.	VA0062189
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Parameter: Total Residual Chlorine (TRC)

Method: DPD Colorimetric (HACH Pocket and Pocket II Colorimeter (11/2014))

X	HACH Manufacturer's Instructions (Method 8167)		
	21st Edition of <i>Standard Methods</i> 4500-Cl G-2000 (SM 21 Cl)		
	22 nd Edition of <i>Standard Methods</i> 4500-Cl G-2011 (SM 22 Cl)		
		Y	N
1)	Is a certificate of operator competence or initial demonstration of capability available for <u>each</u> analyst/operator performing this analysis? NOTE: Analyze 4 samples of known TRC. Must use a lot number or source that is different from that used to prepare calibration standards. May not use Spec [✓] ™. Acceptance range is 70-130% recovery and 20% Relative Standard Deviation (RSD) or within PT specified acceptance range and 20% RSD. [SM 1020 B.1]	☒	☐
2)	Is calibration curve verification checked daily using a high and a low standard? NOTE: May use manufacturer's installed calibration and commercially available chlorine standards, or Spec [✓] ™, for daily calibration verifications. [SM 21 1020]	☒	☐
3)	IF a replicate sample is analyzed is there a written procedure for which result will be reported on DMR (Sample or Replicate) and is this procedure being followed? [DEQ – based on EPA Good Laboratory Practices Standards] NA	☐	☐
4)	Is a Laboratory Control Sample (LCS) tested at least annually and are results within acceptance criteria? [SM 21 B. 2. or SM 22 1020 B 3.] NOTE: LCS should be a purchased Proficiency Test (PT) sample or if a known standard different from the calibration standards is used. Use the PT acceptance criteria when given or use 70-130% recovery and 20% Relative Standard Deviation (RSD) as the acceptance criteria.	☒	☐
5)	Are the DPD Powder Pillows stored in a cool, dry place? [Mfr.]	☒	☐
6)	Are the pillows within the manufacturer's expiration date? [Mfr.]	☒	☐
7)	Are pillows appropriate for the sample size being analyzed and for <u>Total</u> Residual Chlorine	☒	☐
8)	Has buffering capability of DPD pillows been checked annually? (Pillows should adjust sample pH to between 6 and 7) [Mfr.]	☒	☐
9)	When pH adjustment is required, is H ₂ SO ₄ or NaOH used? [Hach 11.3.1]	☒	☐
10)	Are cells clean and in good condition? [Mfr.]	☒	☐
11)	Is the Hach colorimeter program set to measure "TRC, mg/L"? [Mfr.]	☒	☐
12)	Is the low range (0.01 mg/L resolution) used for samples containing residuals from 0.1 mg/L - 2.00 mg/L? [Mfr.]	☒	☐
13)	Is the 10-mL cell (2.5-cm diameter) used for samples from 0-2.00 mg/L? [Mfr.]	☒	☐
14)	Are samples analyzed within 15 minutes of collection? [40 CFR Part 136]	☒	☐
15)	Is meter zeroed correctly using sample for the blank analysis? [Mfr. and SM 21 1020 B.4. or SM 22 1020 B.5.]]	☒	☐
16)	Is the instrument light screen placed correctly on the meter body when the meter is zeroed and when the sample is analyzed? [Mfr.]	☒	☐

- 17) Is the DPD Total Chlorine Powder Pillow mixed into the sample? [Hach 11.1]
- 18) Is the analysis made at least three minutes but not more than six minutes after Powder Pillow addition? [Hach 11.2]
- 19) If read-out exceeds “2.19 mg/L”, is the original sample diluted correctly, and then reanalyzed within 15 minutes of the original collection time? [Hach 1.2 & 2.0]

☒	☐
☒	☐
☒	☐

Comments referenced to checklist items above:

Other comments:

- **HACH Colorimeter was calibrated successfully by Mr. Austin Kirkpatrick. TRC measurements were made in the field laboratory of the facility, and the TRC during the inspection was measured at 3.8 mg/L after chlorine contact chamber and at 0.0 mg/L after the tablet dechlorination units mg/L**

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
EQUIPMENT TEMPERATURE LOG/THERMOMETER VERIFICATION CHECK SHEET
11/2014

FACILITY NAME:	Waterford STP			PERMIT NO:	VA0060500	DATE:	05/29/19			
						ANNUAL THERMOMETER VERIFICATION				
						<i>Is the NIST / NIST-Traceable Reference Thermometer within the manufacturer's expiration date or recertified yearly?</i>			Yes/No	
									Yes	
EQUIPMENT	Preservation Range	In Range?	Inspector Reading	Checked & Logged Daily?	Correct Increment?	DATE CHECKED	MARKED		OFFSET VALUE (Correction)	INSPECT TEMP
							Yes	No	°C	°C
pH METER						9/11/18	☐	☒	0.0	22.1
D.O. METER						9/11/18	☐	☒	0.0	22.0
#1 Sample Refrigerator						9/11/18	☐	☒	0.0	3
#2 Sample Refrigerator						9/11/18	☐	☒	0.1	3.1

PROBLEMS: None

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
SAMPLE ANALYSIS HOLDING TIME/CONTAINER/PRESERVATION CHECK SHEET

Revised 02/2015 [40 CFR, Part 136.3, Table II]

FACILITY NAME:	Waterford STP	VPDES NO	VA0060500	DATE:	05/29/19									
HOLDING TIMES [Note: Collection period (for composites) and Sample Collection time (end of collection period) must be recorded on the COC.]		SAMPLE CONTAINER		PRESERVATION [Note: Preservation is to occur <u>within 15 minutes of the end of the collection period.</u>]										
PARAMETER	APPROVED	MET?		LOGGED?		ADEQ. VOLUME		APPROP. TYPE		APPROVED	MET?		CHECKED?	
		Y	N	Y	N	Y	N	Y	N		Y	N	Y	N ¹
pH	15 MIN.	☒	☐	☒	☐	☐	☐	☐	☐	Within 15 minutes	☐	☐	☐	☐
DISSOLVED O ₂	15 MIN	☒	☐	☒	☐	☐	☐	☐	☐	Within 15 minutes	☐	☐	☐	☐
TRC	15 MIN	☒	☐	☒	☐	☐	☐	☐	☐	Within 15 minutes	☐	☐	☐	☐
BOD5 & CBOD5	48 HOURS	☐	☐	☐	☐	☐	☐	☐	☐	≤6° C	☐	☐	☐	☒
TSS	7 DAYS	☐	☐	☐	☐	☐	☐	☐	☐	≤6° C	☐	☐	☐	☒
FECAL COLIFORM / <i>E. coli</i> / <i>Enterococci</i>	8 HRS	☐	☐	☐	☐	☐	☐	☐	☐	<10° C+0.008% Na ₂ S ₂ O ₃	☐	☐	☐	☒
AMMONIA	28 DAYS	☐	☐	☐	☐	☐	☐	☐	☐	≤6° C+H ₂ SO ₄ pH<2	☐	☐	☐	☒
NITRATE+NITRITE ¹	28 DAYS	☐	☐	☐	☐	☐	☐	☐	☐	≤6° C+H ₂ SO ₄ pH<2	☐	☐	☐	☐
METALS ¹	6 MONTHS	☐	☐	☐	☐	☐	☐	☐	☐	HNO ₃ pH<2 Dissolved Metals: 0.45 µm filter immediately	☐	☐	☐	☐
TKN ¹	28 DAYS	☐	☐	☐	☐	☐	☐	☐	☐	DECHLOR ≤6° C+H ₂ SO ₄ pH<2	☐	☐	☐	☐
PHOSPHORUS ¹	28 DAYS	☐	☐	☐	☐	☐	☐	☐	☐	≤6° C+H ₂ SO ₄ pH<2	☐	☐	☐	☐
PROBLEMS:	None													

Holding Times and Preservation References (VELAP except for Field Tests)

Comments: 1. Metals, nitrate/nitrite, TKN, and phosphorous analyses are not required in the permit.

Attachment 5 – Planning Statement

To: Caitlin Shipman
From: Rebecca Shoemaker

Date: July 24, 2019
Subject: Planning Statement for Waterford Sewage Treatment Plant
Permit Number: VA0060500

Information for Outfall 001:

Discharge Type: Municipal
Discharge Flow: 0.058 MGD
Receiving Stream: South Fork Catoctin Creek
Latitude / Longitude: 39.191371 / -77.615803
Rivermile: 1.63
Streamcode: 1ASOC
Waterbody: PL02
6th Order HUC: VAN-A02R
Water Quality Standards: [Class III, Section 10b, no special standards](#)
Drainage Area: 31.98 mi²

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

This facility discharges to South Fork Catoctin Creek. The nearest DEQ ambient monitoring station is 1aSOC001.66, located at the Rt. 698 bridge crossing, approximately 0.06 miles upstream of Outfall 001. The following is the water quality summary for this segment of South Fork Catoctin Creek, as taken from the 2018 Integrated Report:

Class III, Section 10b.

DEQ monitoring stations located in this segment of South Fork Catoctin Creek:

- *ambient water quality monitoring station 1aSOC001.66 at Route 698*
- *ambient water quality monitoring station 1aSOC005.46 at Route 9*
- *freshwater probabilistic monitoring station 1aSOC002.93, 1.2 miles upstream from Route 698*

Biological monitoring finds a benthic macroinvertebrate impairment, resulting in an impaired classification for the aquatic life use. In 2006, an observed effect for the aquatic life use was noted based on three of 15 samples (20.0%) exceeding the total phosphorus screening value of 0.20 mg/L. While nutrients will not be assessed until nutrient standards are adopted for free-flowing streams, the observed effect remains. An observed effect for mercury (Hg) in sediment was also noted due to an exceedance of the freshwater consensus-based screening value (SV) of 1.06 parts per million (ppm) for mercury (Hg) in sediment recorded in 2001 at station 1aSOC001.66. This observed effect also remains.

E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. The Catoctin Creek bacteria TMDL for the Lower South Fork Catoctin Creek watershed has been completed and

approved; the Catoctin Creek bacteria TMDL Implementation Plan is also complete. The wildlife use is considered fully supporting. There is insufficient information to determine support for the fish consumption use.

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

Table A. 303(d) Impairment and TMDL information for the receiving stream segment

Waterbody Name	Impaired Use	Cause	Year first Listed as Impaired	TMDL completed	WLA	Basis for WLA
Impairment Information in the 2018 Integrated Report						
South Fork Catoctin Creek	Aquatic Life	Benthic Macro-invertebrates	2008	No	---	---
	Recreation	<i>E. coli</i>	1996	Catoctin Creek Bacteria 05/31/2002	1.60E+11 cfu/year fecal coliform	200 cfu/100ml fecal coliform
					1.01E+11 cfu/year <i>E. coli</i> *	126 cfu/100 ml <i>E. coli</i> *

						0.058 MGD

* The WLA is expressed in the Catoctin Creek Bacteria TMDL as cfu/year fecal coliform bacteria.

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

No.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

There is a completed downstream TMDL for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement. This facility is accounted for in the Chesapeake Bay TMDL NPDES Permit Inventory and is part of an aggregated WLA for total nitrogen, total phosphorus, and total suspended solids (Appendix Q).

DEQ planning staff requests the facility perform quarterly nutrient monitoring, specifically total phosphorus, nitrate, nitrite, ammonia, and TKN. Nutrient monitoring is requested of facilities that are located within a five mile distance upstream of a benthic impairment.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

There are no public water supply intakes located within five miles of this discharge.

Attachment 6 – Water Quality Criteria / Wasteload Allocation Analysis

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: **Waterford STP**

Permit No.: **VA0060500**

Receiving Stream: **South Fork Catoctin Creek**

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO3) =	50 mg/L	1Q10 (Annual) =	0.12 MGD	Annual - 1Q10 Mix =	44.09 %	Mean Hardness (as CaCO3) =	50 mg/L
90% Temperature (Annual) =	23.53 deg C	7Q10 (Annual) =	0.15 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	25.6 deg C
90% Temperature (Wet season) =	13.5 deg C	30Q10 (Annual) =	0.35 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	21.45 deg C
90% Maximum pH =	7.65 SU	1Q10 (Wet season) =	1.48 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	7.6 SU
10% Maximum pH =	6.77 SU	30Q10 (Wet season) =	1.91 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	6.8 SU
Tier Designation (1 or 2) =	1	30Q5 =	0.65 MGD			Discharge Flow =	0.058 MGD
Public Water Supply (PWS) Y/N? =	n	Harmonic Mean =	2.54 MGD				
Trout Present Y/N? =	n						
Early Life Stages Present Y/N? =	y						

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				Method
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Target Value
Acenaphthene	5	--	--	na	9.9E+02	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04	1.2E+04
Acrolein	0	3.0E+00	3.0E+00	na	9.3E+00	5.7E+00	1.1E+01	na	4.2E+02	--	--	--	--	--	--	--	--	5.7E+00	1.1E+01	na	4.2E+02	2.3E+00
Acrylonitrile ^C	0	--	--	na	2.5E+00	--	--	na	1.1E+02	--	--	--	--	--	--	--	--	--	--	na	1.1E+02	1.1E+02
Aldrin ^C	0	3.0E+00	--	na	5.0E-04	5.7E+00	--	na	2.2E-02	--	--	--	--	--	--	--	--	5.7E+00	--	na	2.2E-02	2.2E-02
Ammonia-N (mg/l) (Yearly)	0	1.64E+01	2.09E+00	na	--	3.14E+01	1.47E+01	na	--	--	--	--	--	--	--	--	--	3.14E+01	1.47E+01	na	--	8.8E+00
Ammonia-N (mg/l) (High Flow)	0	1.58E+01	3.78E+00	na	--	4.18E+02	1.28E+02	na	--	--	--	--	--	--	--	--	--	4.18E+02	1.28E+02	na	--	7.7E+01
Anthracene	0	--	--	na	4.0E+04	--	--	na	4.9E+05	--	--	--	--	--	--	--	--	--	--	na	4.9E+05	4.9E+05
Antimony	0	--	--	na	6.4E+02	--	--	na	7.8E+03	--	--	--	--	--	--	--	--	--	--	na	7.8E+03	7.8E+03
Arsenic	0	3.4E+02	1.5E+02	na	--	6.5E+02	5.4E+02	na	--	--	--	--	--	--	--	--	--	6.5E+02	5.4E+02	na	--	2.6E+02
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Benzene ^C	0	--	--	na	5.1E+02	--	--	na	2.3E+04	--	--	--	--	--	--	--	--	--	--	na	2.3E+04	2.3E+04
Benzidine ^C	0	--	--	na	2.0E-03	--	--	na	9.0E-02	--	--	--	--	--	--	--	--	--	--	na	9.0E-02	9.0E-02
Benzo (a) anthracene ^C	0	--	--	na	1.8E-01	--	--	na	8.1E+00	--	--	--	--	--	--	--	--	--	--	na	8.1E+00	8.1E+00
Benzo (b) fluoranthene ^C	0	--	--	na	1.8E-01	--	--	na	8.1E+00	--	--	--	--	--	--	--	--	--	--	na	8.1E+00	8.1E+00
Benzo (k) fluoranthene ^C	0	--	--	na	1.8E-01	--	--	na	8.1E+00	--	--	--	--	--	--	--	--	--	--	na	8.1E+00	8.1E+00
Benzo (a) pyrene ^C	0	--	--	na	1.8E-01	--	--	na	8.1E+00	--	--	--	--	--	--	--	--	--	--	na	8.1E+00	8.1E+00
Bis2-Chloroethyl Ether ^C	0	--	--	na	5.3E+00	--	--	na	2.4E+02	--	--	--	--	--	--	--	--	--	--	na	2.4E+02	2.4E+02
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	7.9E+05	--	--	--	--	--	--	--	--	--	--	na	7.9E+05	7.9E+05
Bis 2-Ethylhexyl Phthalate ^C	0	--	--	na	2.2E+01	--	--	na	9.9E+02	--	--	--	--	--	--	--	--	--	--	na	9.9E+02	9.9E+02
Bromoform ^C	0	--	--	na	1.4E+03	--	--	na	6.3E+04	--	--	--	--	--	--	--	--	--	--	na	6.3E+04	6.3E+04
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	2.3E+04	--	--	--	--	--	--	--	--	--	--	na	2.3E+04	2.3E+04
Cadmium	0	1.8E+00	6.6E-01	na	--	3.4E+00	2.4E+00	na	--	--	--	--	--	--	--	--	--	3.4E+00	2.4E+00	na	--	1.4E+00
Carbon Tetrachloride ^C	0	--	--	na	1.6E+01	--	--	na	7.2E+02	--	--	--	--	--	--	--	--	--	--	na	7.2E+02	7.2E+02
Carbaryl	0	2.1E+00	2.1E+00	na	--	4.0E+00	7.5E+00	na	--	--	--	--	--	--	--	--	--	4.0E+00	7.5E+00	na	--	1.6E+00
Chlordane ^C	0	2.4E+00	4.3E-03	na	8.1E-03	4.6E+00	1.5E-02	na	3.6E-01	--	--	--	--	--	--	--	--	4.6E+00	1.5E-02	na	3.6E-01	9.3E-03
Chloride	0	8.6E+05	2.3E+05	na	--	1.6E+06	8.2E+05	na	--	--	--	--	--	--	--	--	--	1.6E+06	8.2E+05	na	--	4.9E+05
TRC	0	1.9E+01	1.1E+01	na	--	3.6E+01	3.9E+01	na	--	--	--	--	--	--	--	--	--	3.6E+01	3.9E+01	na	--	1.5E+01
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	2.0E+04	--	--	--	--	--	--	--	--	--	--	na	2.0E+04	2.0E+04

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				Method Target Value
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Chlorodibromomethane ^C	0	--	--	na	1.3E+02	--	--	na	5.8E+03	--	--	--	--	--	--	--	--	--	--	na	5.8E+03	5.8E+03
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.3E+05	--	--	--	--	--	--	--	--	--	--	na	1.3E+05	1.3E+05
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	2.0E+04	--	--	--	--	--	--	--	--	--	--	na	2.0E+04	2.0E+04
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.8E+03	--	--	--	--	--	--	--	--	--	--	na	1.8E+03	1.8E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	1.6E-01	1.5E-01	na	--	--	--	--	--	--	--	--	--	1.6E-01	1.5E-01	na	--	6.3E-02
Chromium III	0	3.2E+02	4.2E+01	na	--	6.2E+02	1.5E+02	na	--	--	--	--	--	--	--	--	--	6.2E+02	1.5E+02	na	--	9.0E+01
Chromium VI	0	1.6E+01	1.1E+01	na	--	3.1E+01	3.9E+01	na	--	--	--	--	--	--	--	--	--	3.1E+01	3.9E+01	na	--	1.2E+01
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Chrysene ^C	0	--	--	3.8E-02	1.8E-02	--	--	na	8.1E-01	--	--	--	--	--	--	--	--	--	--	na	8.1E-01	8.1E-01
Copper	0	7.0E+00	5.0E+00	na	--	1.3E+01	1.8E+01	na	--	--	--	--	--	--	--	--	--	1.3E+01	1.8E+01	na	--	5.3E+00
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	4.2E+01	1.9E+01	na	2.0E+05	--	--	--	--	--	--	--	--	4.2E+01	1.9E+01	na	2.0E+05	1.1E+01
DDD ^C	0	--	--	na	3.1E-03	--	--	na	1.4E-01	--	--	--	--	--	--	--	--	--	--	na	1.4E-01	1.4E-01
DDE ^C	0	--	--	na	2.2E-03	--	--	na	9.9E-02	--	--	--	--	--	--	--	--	--	--	na	9.9E-02	9.9E-02
DDT ^C	0	1.1E+00	1.0E-03	na	2.2E-03	2.1E+00	3.6E-03	na	9.9E-02	--	--	--	--	--	--	--	--	2.1E+00	3.6E-03	na	9.9E-02	2.2E-03
Demeton	0	--	1.0E-01	na	--	--	3.6E-01	na	--	--	--	--	--	--	--	--	--	--	3.6E-01	na	--	3.6E-01
Diazinon	0	1.7E-01	1.7E-01	na	--	3.3E-01	6.1E-01	na	--	--	--	--	--	--	--	--	--	3.3E-01	6.1E-01	na	--	1.3E-01
Dibenz(a,h)anthracene ^C	0	--	--	na	1.8E-01	--	--	na	8.1E+00	--	--	--	--	--	--	--	--	--	--	na	8.1E+00	8.1E+00
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.6E+04	--	--	--	--	--	--	--	--	--	--	na	1.6E+04	1.6E+04
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04	1.2E+04
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	2.3E+03	--	--	--	--	--	--	--	--	--	--	na	2.3E+03	2.3E+03
3,3-Dichlorobenzidine ^C	0	--	--	na	2.8E-01	--	--	na	1.3E+01	--	--	--	--	--	--	--	--	--	--	na	1.3E+01	1.3E+01
Dichlorobromomethane ^C	0	--	--	na	1.7E+02	--	--	na	7.6E+03	--	--	--	--	--	--	--	--	--	--	na	7.6E+03	7.6E+03
1,2-Dichloroethane ^C	0	--	--	na	3.7E+02	--	--	na	1.7E+04	--	--	--	--	--	--	--	--	--	--	na	1.7E+04	1.7E+04
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	8.7E+04	--	--	--	--	--	--	--	--	--	--	na	8.7E+04	8.7E+04
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.2E+05	--	--	--	--	--	--	--	--	--	--	na	1.2E+05	1.2E+05
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	3.5E+03	--	--	--	--	--	--	--	--	--	--	na	3.5E+03	3.5E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
1,2-Dichloropropane ^C	0	--	--	na	1.5E+02	--	--	na	6.7E+03	--	--	--	--	--	--	--	--	--	--	na	6.7E+03	6.7E+03
1,3-Dichloropropene ^C	0	--	--	na	2.1E+02	--	--	na	9.4E+03	--	--	--	--	--	--	--	--	--	--	na	9.4E+03	9.4E+03
Dieldrin ^C	0	2.4E-01	5.6E-02	na	5.4E-04	4.6E-01	2.0E-01	na	2.4E-02	--	--	--	--	--	--	--	--	4.6E-01	2.0E-01	na	2.4E-02	2.4E-02
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	5.4E+05	--	--	--	--	--	--	--	--	--	--	na	5.4E+05	5.4E+05
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	1.0E+04	--	--	--	--	--	--	--	--	--	--	na	1.0E+04	1.0E+04
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.3E+07	--	--	--	--	--	--	--	--	--	--	na	1.3E+07	1.3E+07
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	5.5E+04	--	--	--	--	--	--	--	--	--	--	na	5.5E+04	5.5E+04
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+04	6.5E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	3.4E+03	--	--	--	--	--	--	--	--	--	--	na	3.4E+03	3.4E+03
2,4-Dinitrotoluene ^C	0	--	--	na	3.4E+01	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03	1.5E+03
Dioxin 2,3,7,8- tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	6.2E-07	--	--	--	--	--	--	--	--	--	--	na	6.2E-07	6.2E-07
1,2-Diphenylhydrazine ^C	0	--	--	na	2.0E+00	--	--	na	9.0E+01	--	--	--	--	--	--	--	--	--	--	na	9.0E+01	9.0E+01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	4.2E-01	2.0E-01	na	1.1E+03	--	--	--	--	--	--	--	--	4.2E-01	2.0E-01	na	1.1E+03	1.2E-01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	4.2E-01	2.0E-01	na	1.1E+03	--	--	--	--	--	--	--	--	4.2E-01	2.0E-01	na	1.1E+03	1.2E-01
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	4.2E-01	2.0E-01	--	--	--	--	--	--	--	--	--	--	4.2E-01	2.0E-01	--	--	1.2E-01
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03	1.1E+03
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	1.6E-01	1.3E-01	na	7.3E-01	--	--	--	--	--	--	--	--	1.6E-01	1.3E-01	na	7.3E-01	6.6E-02
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.7E+00	--	--	--	--	--	--	--	--	--	--	na	3.7E+00	3.7E+00

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				Method Target Value
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.6E+04	--	--	--	--	--	--	--	--	--	--	na	2.6E+04	2.6E+04
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.7E+03	--	--	--	--	--	--	--	--	--	--	na	1.7E+03	1.7E+03
Fluorene	0	--	--	na	5.3E+03	--	--	na	6.5E+04	--	--	--	--	--	--	--	--	--	--	na	6.5E+04	6.5E+04
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Guthion	0	--	1.0E-02	na	--	--	3.6E-02	na	--	--	--	--	--	--	--	--	--	--	3.6E-02	na	--	3.6E-02
Heptachlor ^C	0	5.2E-01	3.8E-03	na	7.9E-04	9.9E-01	1.4E-02	na	3.5E-02	--	--	--	--	--	--	--	--	9.9E-01	1.4E-02	na	3.5E-02	8.2E-03
Heptachlor Epoxide ^C	0	5.2E-01	3.8E-03	na	3.9E-04	9.9E-01	1.4E-02	na	1.7E-02	--	--	--	--	--	--	--	--	9.9E-01	1.4E-02	na	1.7E-02	8.2E-03
Hexachlorobenzene ^C	0	--	--	na	2.9E-03	--	--	na	1.3E-01	--	--	--	--	--	--	--	--	--	--	na	1.3E-01	1.3E-01
Hexachlorobutadiene ^C	0	--	--	na	1.8E+02	--	--	na	8.1E+03	--	--	--	--	--	--	--	--	--	--	na	8.1E+03	8.1E+03
Hexachlorocyclohexane																						
Alpha-BHC ^C	0	--	--	na	4.9E-02	--	--	na	2.2E+00	--	--	--	--	--	--	--	--	--	--	na	2.2E+00	2.2E+00
Hexachlorocyclohexane																						
Beta-BHC ^C	0	--	--	na	1.7E-01	--	--	na	7.6E+00	--	--	--	--	--	--	--	--	--	--	na	7.6E+00	7.6E+00
Hexachlorocyclohexane																						
Gamma-BHC ^C (Lindane)	0	9.5E-01	na	na	1.8E+00	1.8E+00	--	na	8.1E+01	--	--	--	--	--	--	--	--	1.8E+00	--	na	8.1E+01	7.3E-01
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.3E+04	--	--	--	--	--	--	--	--	--	--	na	1.3E+04	1.3E+04
Hexachloroethane ^C	0	--	--	na	3.3E+01	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03	1.5E+03
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	7.2E+00	na	--	--	--	--	--	--	--	--	--	--	7.2E+00	na	--	7.2E+00
Indeno (1,2,3-cd) pyrene ^C	0	--	--	na	1.8E-01	--	--	na	8.1E+00	--	--	--	--	--	--	--	--	--	--	na	8.1E+00	8.1E+00
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Isophorone ^C	0	--	--	na	9.6E+03	--	--	na	4.3E+05	--	--	--	--	--	--	--	--	--	--	na	4.3E+05	4.3E+05
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--	0.0E+00
Lead	0	4.4E+01	5.0E+00	na	--	8.4E+01	1.8E+01	na	--	--	--	--	--	--	--	--	--	8.4E+01	1.8E+01	na	--	1.1E+01
Malathion	0	--	1.0E-01	na	--	--	3.6E-01	na	--	--	--	--	--	--	--	--	--	--	3.6E-01	na	--	3.6E-01
Mercury	0	1.4E+00	7.7E-01	--	--	2.7E+00	2.8E+00	--	--	--	--	--	--	--	--	--	--	2.7E+00	2.8E+00	--	--	1.1E+00
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.8E+04	--	--	--	--	--	--	--	--	--	--	na	1.8E+04	1.8E+04
Methylene Chloride ^C	0	--	--	na	5.9E+03	--	--	na	2.6E+05	--	--	--	--	--	--	--	--	--	--	na	2.6E+05	2.6E+05
Methoxychlor	0	--	3.0E-02	na	--	--	1.1E-01	na	--	--	--	--	--	--	--	--	--	--	1.1E-01	na	--	6.5E-02
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--	0.0E+00
Nickel	0	1.0E+02	1.1E+01	na	4.6E+03	1.9E+02	4.0E+01	na	5.6E+04	--	--	--	--	--	--	--	--	1.9E+02	4.0E+01	na	5.6E+04	2.4E+01
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	8.4E+03	--	--	--	--	--	--	--	--	--	--	na	8.4E+03	8.4E+03
N-Nitrosodimethylamine ^C	0	--	--	na	3.0E+01	--	--	na	1.3E+03	--	--	--	--	--	--	--	--	--	--	na	1.3E+03	1.3E+03
N-Nitrosodiphenylamine ^C	0	--	--	na	6.0E+01	--	--	na	2.7E+03	--	--	--	--	--	--	--	--	--	--	na	2.7E+03	2.7E+03
N-Nitrosodi-n-propylamine ^C	0	--	--	na	5.1E+00	--	--	na	2.3E+02	--	--	--	--	--	--	--	--	--	--	na	2.3E+02	2.3E+02
Nonylphenol	0	2.8E+01	6.6E+00	--	--	5.4E+01	2.4E+01	na	--	--	--	--	--	--	--	--	--	5.4E+01	2.4E+01	na	--	1.4E+01
Parathion	0	6.5E-02	1.3E-02	na	--	1.2E-01	4.7E-02	na	--	--	--	--	--	--	--	--	--	1.2E-01	4.7E-02	na	--	2.8E-02
PCB Total ^C	0	--	1.4E-02	na	6.4E-04	--	5.0E-02	na	2.9E-02	--	--	--	--	--	--	--	--	--	5.0E-02	na	2.9E-02	2.9E-02
Pentachlorophenol ^C	0	7.0E+00	5.4E+00	na	3.0E+01	1.3E+01	1.9E+01	na	1.3E+03	--	--	--	--	--	--	--	--	1.3E+01	1.9E+01	na	1.3E+03	5.4E+00
Phenol	0	--	--	na	8.6E+05	--	--	na	1.0E+07	--	--	--	--	--	--	--	--	--	--	na	1.0E+07	1.0E+07
Pyrene	0	--	--	na	4.0E+03	--	--	na	4.9E+04	--	--	--	--	--	--	--	--	--	--	na	4.9E+04	4.9E+04
Radionuclides																						
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations				Method Target Value
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	3.8E+01	1.8E+01	na	5.1E+04	--	--	--	--	--	--	--	--	3.8E+01	1.8E+01	na	5.1E+04	1.1E+01
Silver	0	1.0E+00	--	na	--	2.0E+00	--	na	--	--	--	--	--	--	--	--	--	2.0E+00	--	na	--	8.0E-01
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
1,1,2,2-Tetrachloroethane ^C	0	--	--	na	4.0E+01	--	--	na	1.8E+03	--	--	--	--	--	--	--	--	--	--	na	1.8E+03	1.8E+03
Tetrachloroethylene ^C	0	--	--	na	3.3E+01	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03	1.5E+03
Thallium	0	--	--	na	4.7E-01	--	--	na	5.7E+00	--	--	--	--	--	--	--	--	--	--	na	5.7E+00	5.7E+00
Toluene	0	--	--	na	6.0E+03	--	--	na	7.3E+04	--	--	--	--	--	--	--	--	--	--	na	7.3E+04	7.3E+04
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Toxaphene ^C	0	7.3E-01	2.0E-04	na	2.8E-03	1.4E+00	7.2E-04	na	1.3E-01	--	--	--	--	--	--	--	--	1.4E+00	7.2E-04	na	1.3E-01	4.3E-04
Tributyltin	0	4.6E-01	7.2E-02	na	--	8.8E-01	2.6E-01	na	--	--	--	--	--	--	--	--	--	8.8E-01	2.6E-01	na	--	1.5E-01
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	8.5E+02	--	--	--	--	--	--	--	--	--	--	na	8.5E+02	8.5E+02
1,1,2-Trichloroethane ^C	0	--	--	na	1.6E+02	--	--	na	7.2E+03	--	--	--	--	--	--	--	--	--	--	na	7.2E+03	7.2E+03
Trichloroethylene ^C	0	--	--	na	3.0E+02	--	--	na	1.3E+04	--	--	--	--	--	--	--	--	--	--	na	1.3E+04	1.3E+04
2,4,6-Trichlorophenol ^C	0	--	--	na	2.4E+01	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03	1.1E+03
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--	0.0E+00
Vinyl Chloride ^C	0	--	--	na	2.4E+01	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03	1.1E+03
Zinc	0	6.5E+01	6.6E+01	na	2.6E+04	1.2E+02	2.4E+02	na	3.2E+05	--	--	--	--	--	--	--	--	1.2E+02	2.4E+02	na	3.2E+05	5.0E+01

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
Antidegradation WLAs are based upon a complete mix.
- Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
= (0.1(WQC - background conc.) + background conc.) for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

0.058 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGD) 0.058				<u>Ammonia - Dry Season - Acute</u>		<u>Ammonia - Dry Season - Chronic</u>	
Stream Flows		Total Mix Flows		90th Percentile pH (SU)	7.623	90th Percentile Temp. (deg C)	23.824
<u>Allocated to Mix (MGD)</u>		<u>Stream + Discharge (MGD)</u>		(7.204 - pH)	-0.419	90th Percentile pH (SU)	7.643
<u>Dry Season</u>	<u>Wet Season</u>	<u>Dry Season</u>	<u>Wet Season</u>	(pH - 7.204)	0.419	MIN	1.564
1Q10	0.053	1.480	0.111	1.538		MAX	23.824
7Q10	0.150	N/A	0.208	N/A		(7.688 - pH)	0.045
30Q10	0.350	1.910	0.408	1.968		(pH - 7.688)	-0.045
30Q5	0.650	N/A	0.708	N/A	Trout Present Criterion (mg N/L)	10.958	
Harm. Mean	2.540	N/A	2.598	N/A	Trout Absent Criterion (mg N/L)	16.408	
Annual Avg.	0.000	N/A	0.058	N/A	Trout Present?	n	
					Effective Criterion (mg N/L)	16.408	
<u>Stream/Discharge Mix Values</u>				<u>Ammonia - Wet Season - Acute</u>		<u>Ammonia - Wet Season - Chronic</u>	
		<u>Dry Season</u>	<u>Wet Season</u>	90th Percentile pH (SU)	7.648	90th Percentile Temp. (deg C)	13.734
1Q10 90th% Temp. Mix (deg C)		24.613	13.800	(7.204 - pH)	-0.444	90th Percentile pH (SU)	7.648
30Q10 90th% Temp. Mix (deg C)		23.824	13.734	(pH - 7.204)	0.444	MIN	2.850
1Q10 90th% pH Mix (SU)		7.623	7.648			MAX	13.734
30Q10 90th% pH Mix (SU)		7.643	7.648			(7.688 - pH)	0.040
1Q10 10th% pH Mix (SU)		6.785	N/A			(pH - 7.688)	-0.040
7Q10 10th% pH Mix (SU)		6.778	N/A				
		<u>Calculated</u>	<u>Formula Inputs</u>	Trout Present Criterion (mg N/L)	10.520	Early LS Present Criterion (mg N/L)	3.784
1Q10 Hardness (mg/L as CaCO3)		50.0	50.0	Trout Absent Criterion (mg N/L)	15.753	Early LS Absent Criterion (mg N/L)	3.980
7Q10 Hardness (mg/L as CaCO3)		50.0	50.0	Trout Present?	n	Early Life Stages Present?	y
				Effective Criterion (mg N/L)	15.753	Effective Criterion (mg N/L)	3.784

0.058 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGD) 0.058				<u>Ammonia - Dry Season - Acute</u>		<u>Ammonia - Dry Season - Chronic</u>	
100% Stream Flows		Total Mix Flows		90th Percentile pH (SU)	7.633	90th Percentile Temp. (deg C)	23.824
<u>Allocated to Mix (MGD)</u>		<u>Stream + Discharge (MGD)</u>		(7.204 - pH)	-0.429	90th Percentile pH (SU)	7.643
<u>Dry Season</u>	<u>Wet Season</u>	<u>Dry Season</u>	<u>Wet Season</u>	(pH - 7.204)	0.429	MIN	1.564
1Q10	0.120	1.480	0.178	1.538		MAX	23.824
7Q10	0.150	N/A	0.208	N/A		(7.688 - pH)	0.045
30Q10	0.350	1.910	0.408	1.968		(pH - 7.688)	-0.045
30Q5	0.650	N/A	0.708	N/A	Trout Present Criterion (mg N/L)	10.782	
Harm. Mean	2.540	N/A	2.598	N/A	Trout Absent Criterion (mg N/L)	16.144	
Annual Avg.	0.000	N/A	0.058	N/A	Trout Present?	n	
					Effective Criterion (mg N/L)	16.144	
<u>Stream/Discharge Mix Values</u>				<u>Ammonia - Wet Season - Acute</u>		<u>Ammonia - Wet Season - Chronic</u>	
		<u>Dry Season</u>	<u>Wet Season</u>	90th Percentile pH (SU)	7.648	90th Percentile Temp. (deg C)	13.734
1Q10 90th% Temp. Mix (deg C)		24.204	13.800	(7.204 - pH)	-0.444	90th Percentile pH (SU)	7.648
30Q10 90th% Temp. Mix (deg C)		23.824	13.734	(pH - 7.204)	0.444	MIN	2.850
1Q10 90th% pH Mix (SU)		7.633	7.648			MAX	13.734
30Q10 90th% pH Mix (SU)		7.643	7.648			(7.688 - pH)	0.040
1Q10 10th% pH Mix (SU)		6.780	N/A			(pH - 7.688)	-0.040
7Q10 10th% pH Mix (SU)		6.778	N/A				
		<u>Calculated</u>	<u>Formula Inputs</u>	Trout Present Criterion (mg N/L)	10.520	Early LS Present Criterion (mg N/L)	3.784
1Q10 Hardness (mg/L as CaCO3) =		50.000	50.000	Trout Absent Criterion (mg N/L)	15.753	Early LS Absent Criterion (mg N/L)	3.980
7Q10 Hardness (mg/L as CaCO3) =		50.000	50.000	Trout Present?	n	Early Life Stages Present?	y
				Effective Criterion (mg N/L)	15.753	Effective Criterion (mg N/L)	3.784

Attachment 7 – Ambient pH & Temperature Data

Temp Celsius is not null

Field Ph is not null

Do Probe is not null

Do Optical is not null

Date Time between 2014-02-10 and 2019-04-19

Station ID contains 1aSOC001.66

StationID	Collection Date	Longitude	Latitude	pH (SU)	DO Probe	DO Optical	SpCond	Temp ('C)
1ASOC001.66	1/4/2016	-77.6158333	39.1908333	6.97		12.38	193	4.68
	2/8/2016	-77.6158333	39.1908333	7.35	13.71		174	4.05
	3/9/2016	-77.6158333	39.1908333	6.69		12.39	199	9.75
	4/5/2016	-77.6158333	39.1908333	6.95		13.01	218	7.96
	5/3/2016	-77.6158333	39.1908333	7.10		8.69	145	17.25
	6/7/2016	-77.6158333	39.1908333	7.71		9.6	226	23.78
	7/5/2016	-77.6158333	39.1908333	7.49		8.14	194	21.30
	8/1/2016	-77.6158333	39.1908333	7.22		7.77	180	24.12
	9/6/2016	-77.6158333	39.1908333	7.37		9	278	20.32
	10/3/2016	-77.6158333	39.1908333	7.51	9.71		223	18.36
	11/2/2016	-77.6158333	39.1908333	7.50		12.1	288	11.62
	12/1/2016	-77.6158333	39.1908333	7.34	11.31		230	9.23

Percentile

	90th	10th
pH (annual)	7.65	6.77
Temp (annual)	23.53	-
Temp (Dec-May)	13.50	-

Attachment 8 – Effluent pH & Temperature Data

Date	pH (SU)	Temp ('C)	Date	pH (SU)	Temp ('C)	Date	pH (SU)	Temp ('C)
2/1/2017			6/2/2017			8/1/2017		
2/2/2017			6/3/2017			8/2/2017		
2/3/2017			6/4/2017			8/3/2017		
2/4/2017			6/5/2017			8/4/2017		
2/5/2017			6/6/2017			8/5/2017		
2/6/2017	7.00	6.300	6/7/2017			8/6/2017		
2/7/2017	7.20	6.200	6/8/2017			8/7/2017	7.00	24.00
2/8/2017	7.30	6.000	6/9/2017			8/8/2017	6.90	25.30
2/9/2017	7.10	7.400	6/10/2017			8/9/2017	7.00	24.70
2/10/2017	7.00	6.300	6/11/2017			8/10/2017	6.70	24.90
2/11/2017			6/12/2017			8/11/2017	6.80	25.40
2/12/2017			6/13/2017			8/12/2017		
2/13/2017			6/14/2017			8/13/2017		
2/14/2017			6/15/2017			8/14/2017		
2/15/2017			6/16/2017			8/15/2017		
2/16/2017			6/17/2017			8/16/2017		
2/17/2017			6/18/2017			8/17/2017		
2/18/2017			6/19/2017	6.90	25.10	8/18/2017		
2/19/2017			6/20/2017	7.50	26.80	8/19/2017		
2/20/2017			6/21/2017	7.30	27.20	8/20/2017		
2/21/2017			6/22/2017	7.00	27.40	8/21/2017		
2/22/2017			6/23/2017	6.90	27.10	8/22/2017		
2/23/2017			6/24/2017			8/23/2017		
2/24/2017			6/25/2017			8/24/2017		
2/25/2017			6/26/2017			8/25/2017		
2/26/2017			6/27/2017			8/26/2017		
2/27/2017			6/28/2017			8/27/2017		
2/28/2017			6/29/2017			8/28/2017		
5/1/2017	7.00	20.50	6/30/2017			8/29/2017		
5/2/2017	7.10	22.00	7/1/2017			8/30/2017		
5/3/2017	7.30	21.90	7/2/2017			8/31/2017		
5/4/2017	7.50	20.20	7/3/2017			9/1/2017		
5/5/2017	7.10	19.90	7/4/2017			9/2/2017		
5/6/2017			7/5/2017			9/3/2017		
5/7/2017			7/6/2017			9/4/2017		
5/8/2017	7.00	17.10	7/7/2017			9/5/2017		
5/9/2017	7.30	17.50	7/8/2017			9/6/2017		
5/10/2017	7.50	18.50	7/9/2017			9/7/2017		
5/11/2017	7.10	19.20	7/10/2017			9/8/2017		
5/12/2017	7.30	18.20	7/11/2017			9/9/2017		
5/13/2017			7/12/2017			9/10/2017		
5/14/2017			7/13/2017			9/11/2017	7.2	18.5
5/15/2017	7.10	16.50	7/14/2017			9/12/2017	7.0	20.1
5/16/2017	7.00	18.10	7/15/2017			9/13/2017	6.7	20.5
5/17/2017	7.40	20.00	7/16/2017			9/14/2017	6.9	20.7
5/18/2017	7.60	22.30	7/17/2017	7.20	25.00	9/15/2017	7.0	20.6
5/19/2017	6.90	23.60	7/18/2017	7.10	27.90	9/16/2017		
5/20/2017			7/19/2017	7.30	28.60	9/17/2017		
5/21/2017			7/20/2017	7.00	28.90	9/18/2017	7.1	21.4
5/22/2017			7/21/2017	6.90	29.20	9/19/2017	7.0	22.5
5/23/2017			7/22/2017			9/20/2017	6.8	22.8
5/24/2017			7/23/2017			9/21/2017	7.2	22.8
5/25/2017			7/24/2017	7.20	27.00	9/22/2017	6.8	22.8
5/26/2017			7/25/2017	6.80	28.60	9/23/2017		
5/27/2017			7/26/2017	7.10	27.20	9/24/2017		
5/28/2017			7/27/2017	7.10	27.50	9/25/2017		
5/29/2017			7/28/2017	6.90	27.60	9/26/2017		
5/30/2017			7/29/2017			9/27/2017		
5/31/2017			7/30/2017			9/28/2017		
6/1/2017			7/31/2017			9/29/2017		

Date	pH (SU)	Temp ('C)	Date	pH (SU)	Temp ('C)	Date	pH (SU)	Temp ('C)
9/30/2017			12/29/2017			4/29/2018		
11/1/2017			12/30/2017			4/30/2018		
11/2/2017			12/31/2017			5/1/2018		
11/3/2017			2/1/2018			5/2/2018		
11/4/2017			2/2/2018			5/3/2018		
11/5/2017			2/3/2018			5/4/2018		
11/6/2017	6.9	14.2	2/4/2018			5/5/2018		
11/7/2017	7.0	14.2	2/5/2018	6.6	6	5/6/2018		
11/8/2017	7.0	12.6	2/6/2018	7.1	3.1	5/7/2018	7.60	17.30
11/9/2017	7.2	12.5	2/7/2018	7.4	3.7	5/8/2018	7.40	19.50
11/10/2017			2/8/2018	7.2	2.4	5/9/2018	7.30	20.40
11/11/2017			2/9/2018	7.2	2.5	5/10/2018	7.40	21.40
11/12/2017			2/10/2018	7.5	2.8	5/11/2018	7.20	21.30
11/13/2017	6.8	10.0	2/11/2018			5/12/2018		
11/14/2017	6.7	9.7	2/12/2018			5/13/2018		
11/15/2017	7.1	9.2	2/13/2018			5/14/2018		
11/16/2017	6.9	8.9	2/14/2018			5/15/2018		
11/17/2017	7.0	9.1	2/15/2018			5/16/2018		
11/18/2017			2/16/2018			5/17/2018		
11/19/2017			2/17/2018			5/18/2018		
11/20/2017			2/18/2018			5/19/2018		
11/21/2017			2/19/2018			5/20/2018		
11/22/2017			2/20/2018			5/21/2018	7.10	20.30
11/23/2017			2/21/2018			5/22/2018	7.00	23.40
11/24/2017			2/22/2018			5/23/2018	7.30	23.70
11/25/2017			2/23/2018			5/24/2018	7.50	23.80
11/26/2017			2/24/2018			5/25/2018	7.60	24.50
11/27/2017			2/25/2018			5/26/2018	7.40	25.40
11/28/2017			2/26/2018			5/27/2018		
11/29/2017			2/27/2018			5/28/2018		
11/30/2017			2/28/2018			5/29/2018	7.60	24.10
12/1/2017			4/1/2018			5/30/2018	7.30	25.80
12/2/2017			4/2/2018			5/31/2018	6.80	25.60
12/3/2017			4/3/2018			6/1/2018		
12/4/2017	6.9	7.8	4/4/2018			6/2/2018		
12/5/2017	7.0	10.1	4/5/2018			6/3/2018		
12/6/2017	7.0	7.7	4/6/2018			6/4/2018	8.0	22.7
12/7/2017	7.1	9.1	4/7/2018			6/5/2018	7.3	23.7
12/8/2017	6.9	6.8	4/8/2018			6/6/2018	7.1	23.3
12/9/2017			4/9/2018	7.60	8.40	6/7/2018	7.4	23.1
12/10/2017			4/10/2018	7.40	9.80	6/8/2018	7.0	23.5
12/11/2017	7.7	5.2	4/11/2018	7.30	10.60	6/9/2018		
12/12/2017	7.0	5.2	4/12/2018	7.20	11.10	6/10/2018		
12/13/2017	6.8	6.9	4/13/2018	7.20	13.10	6/11/2018	7.8	22.6
12/14/2017	7.1	7.1	4/14/2018			6/12/2018	7.0	23.2
12/15/2017	6.9	6.5	4/15/2018			6/13/2018	7.1	23.8
12/16/2017			4/16/2018			6/14/2018	6.9	24.1
12/17/2017			4/17/2018			6/15/2018	7.1	24.3
12/18/2017	6.9	7.7	4/18/2018			6/16/2018		
12/19/2017	6.7	3.6	4/19/2018			6/17/2018		
12/20/2017	6.8	5.3	4/20/2018			6/18/2018	7.2	23.9
12/21/2017	6.7	5.0	4/21/2018			6/19/2018	7.5	26.4
12/22/2017	7.0	4.8	4/22/2018			6/20/2018	7.2	26.2
12/23/2017			4/23/2018	7.80	12.20	6/21/2018	7.4	26.4
12/24/2017			4/24/2018	8.00	15.00	6/22/2018	7.3	26.5
12/25/2017			4/25/2018	7.80	15.20	6/23/2018		
12/26/2017			4/26/2018	8.10	15.10	6/24/2018		
12/27/2017			4/27/2018	8.10	16.10	6/25/2018	7.4	24.5
12/28/2017			4/28/2018			6/26/2018	7.2	25.4

Date	pH (SU)	Temp ('C)	Date	pH (SU)	Temp ('C)	Date	pH (SU)	Temp ('C)
6/27/2018	7.3	25.6	8/25/2018			10/23/2018		
6/28/2018	7.2	25.6	8/26/2018			10/24/2018		
6/29/2018	7.0	26.2	8/27/2018	7	24.2	10/25/2018		
6/30/2018			8/28/2018	7	25.2	10/26/2018		
7/1/2018			8/29/2018	6.9	25.3	10/27/2018		
7/2/2018			8/30/2018	7	25.7	10/28/2018		
7/3/2018			8/31/2018	6.8	26.1	10/29/2018		
7/4/2018			9/1/2018	7.0	20.4	10/30/2018		
7/5/2018			9/2/2018	6.9	20.8	10/31/2018		
7/6/2018			9/3/2018	6.8	21.3	11/1/2018		
7/7/2018			9/4/2018	7.0	21.0	11/2/2018		
7/8/2018			9/5/2018	7.0	22.2	11/3/2018		
7/9/2018	0.049	7.1	9/6/2018			11/4/2018		
7/10/2018	0.049	7.3	9/7/2018			11/5/2018	6.8	13.1
7/11/2018	0.049	7.0	9/8/2018			11/6/2018	7.3	12.7
7/12/2018	0.052	7.0	9/9/2018			11/7/2018	7.0	12.3
7/13/2018	0.023	7.4	9/10/2018			11/8/2018	6.9	12.1
7/14/2018			9/11/2018			11/9/2018	7.0	12.2
7/15/2018			9/12/2018			11/10/2018		
7/16/2018	0.056	7.0	9/13/2018			11/11/2018		
7/17/2018	0.054	7.2	9/14/2018			11/12/2018		
7/18/2018	0.051	7.0	9/15/2018	7.2	18.4	11/13/2018	6.9	9.5
7/19/2018	0.049	7.1	9/16/2018	6.9	17.7	11/14/2018	7.2	8.4
7/20/2018	0.031	7.0	9/17/2018	7.2	17.9	11/15/2018	7.6	7.1
7/21/2018			9/18/2018	6.8	16.3	11/16/2018	7.0	7.3
7/22/2018			9/19/2018	7.0	17.6	11/17/2018		
7/23/2018	0.059	7.8	9/20/2018			11/18/2018		
7/24/2018	0.056	7.1	9/21/2018			11/19/2018	7.6	7.2
7/25/2018	0.053	7.3	9/22/2018			11/20/2018	7.3	7.2
7/26/2018	0.054	7.0	9/23/2018			11/21/2018	7.3	7.1
7/27/2018	0.022	6.6	9/24/2018			11/22/2018		
7/28/2018			9/25/2018			11/23/2018		
7/29/2018			9/26/2018			11/24/2018		
7/30/2018			9/27/2018			11/25/2018		
7/31/2018			9/28/2018			11/26/2018	7.1	12.1
8/1/2018			9/29/2018			11/27/2018	7.5	5.5
8/2/2018			9/30/2018			11/28/2018	7.0	4.7
8/3/2018			10/1/2018	7.0	20.4	11/29/2018	7.5	6.1
8/4/2018			10/2/2018	6.9	20.8	11/30/2018	7.1	4.1
8/5/2018			10/3/2018	6.8	21.3	12/1/2018		
8/6/2018			10/4/2018	7.0	21.0	12/2/2018		
8/7/2018			10/5/2018	7.0	22.2	12/3/2018	7.30	5.80
8/8/2018			10/6/2018			12/4/2018	7.00	5.50
8/9/2018			10/7/2018			12/5/2018	7.20	4.80
8/10/2018			10/8/2018			12/6/2018	7.40	4.60
8/11/2018			10/9/2018			12/7/2018	7.00	5.00
8/12/2018			10/10/2018			12/8/2018		
8/13/2018			10/11/2018			12/9/2018		
8/14/2018			10/12/2018			12/10/2018	7.30	4.40
8/15/2018			10/13/2018			12/11/2018	7.10	2.50
8/16/2018			10/14/2018			12/12/2018	7.30	2.70
8/17/2018			10/15/2018	7.2	18.4	12/13/2018	7.20	3.50
8/18/2018			10/16/2018	6.9	17.7	12/14/2018	7.00	3.10
8/19/2018			10/17/2018	7.2	17.9	12/15/2018		
8/20/2018	6.7	25.3	10/18/2018	6.8	16.3	12/16/2018		
8/21/2018	6.9	25.9	10/19/2018	7.0	17.6	12/17/2018	6.80	5.40
8/22/2018	7.1	25.3	10/20/2018			12/18/2018	7.30	4.80
8/23/2018	7	24.7	10/21/2018			12/19/2018	7.30	4.50
8/24/2018	7.2	24.5	10/22/2018			12/20/2018	7.60	6.80

Date	pH (SU)	Temp ('C)	Date	pH (SU)	Temp ('C)	Percentile	
12/21/2018			2/18/2019			90th	10th
12/22/2018			2/19/2019			pH (annual)	7.60
12/23/2018			2/20/2019			Temp (annual)	25.60
12/24/2018			2/21/2019			Temp (Dec-May)	21.45
12/25/2018			2/22/2019				
12/26/2018			2/23/2019				
12/27/2018			2/24/2019				
12/28/2018			2/25/2019	7.4	5.2		
12/29/2018			2/26/2019	7.5	6.1		
12/30/2018			2/27/2019	7.4	5.5		
12/31/2018			2/28/2019	7.5	5.5		
1/1/2019			3/1/2019	7.4	5.7		
1/2/2019			3/2/2019				
1/3/2019			3/3/2019				
1/4/2019			3/4/2019	7.6	5.8		
1/5/2019			3/5/2019	7.5	4.7		
1/6/2019			3/6/2019	7.5	4.2		
1/7/2019	7.60	5.90	3/7/2019	7.5	5.3		
1/8/2019	7.80	7.70	3/8/2019	7.2	5.2		
1/9/2019	7.10	9.70	3/9/2019				
1/10/2019	7.20	4.50	3/10/2019				
1/11/2019	7.40	6.50	3/11/2019	7.6	5.6		
1/12/2019			3/12/2019	7.3	6.2		
1/13/2019			3/13/2019	7	7.4		
1/14/2019	7.50	3.70	3/14/2019	7	8.4		
1/15/2019	7.60	2.90	3/15/2019	7.1	11.5		
1/16/2019	7.60	1.90	3/16/2019				
1/17/2019	7.50	3.70	3/17/2019				
1/18/2019	7.50	4.10	3/18/2019				
1/19/2019			3/19/2019				
1/20/2019			3/20/2019				
1/21/2019			3/21/2019				
1/22/2019	7.50	1.20	3/22/2019				
1/23/2019	7.60	1.00	3/23/2019				
1/24/2019	7.40	8.40	3/24/2019				
1/25/2019	7.50	5.00	3/25/2019	7.6	7.7		
1/26/2019			3/26/2019	7.7	7.4		
1/27/2019			3/27/2019	7.3	7.8		
1/28/2019	7.40	2.40	3/28/2019	7.5	8.1		
1/29/2019	7.40	2.20	3/29/2019	7.5	8.2		
1/30/2019	7.50	1.10	3/30/2019				
1/31/2019	7.30	0.80	3/31/2019				
2/1/2019	7.1	1.9					
2/2/2019							
2/3/2019							
2/4/2019	7.5	1.9					
2/5/2019	7.3	2					
2/6/2019	7.4	2.7					
2/7/2019	7.2	4.2					
2/8/2019	7.1	5.2					
2/9/2019							
2/10/2019							
2/11/2019	7.3	4.3					
2/12/2019	7.3	3.5					
2/13/2019	7.4	3.3					
2/14/2019	7.5	6.1					
2/15/2019	7.3	5.4					
2/16/2019							
2/17/2019							

Attachment 9 – Discharge Monitoring Reports

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	7/10/2014	AMMONIA, AS N JUN-NOV				1.5	4
VA0060500	8/10/2014	AMMONIA, AS N JUN-NOV				5.7	12.5
VA0060500	9/10/2014	AMMONIA, AS N JUN-NOV				14.3	15.3
VA0060500	10/10/2014	AMMONIA, AS N JUN-NOV					
VA0060500	11/10/2014	AMMONIA, AS N JUN-NOV					
VA0060500	12/10/2014	AMMONIA, AS N JUN-NOV					
VA0060500	7/10/2015	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	8/10/2015	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	9/10/2015	AMMONIA, AS N JUN-NOV					
VA0060500	10/10/2015	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	11/10/2015	AMMONIA, AS N JUN-NOV				1.78	2.8
VA0060500	12/10/2015	AMMONIA, AS N JUN-NOV					
VA0060500	7/10/2016	AMMONIA, AS N JUN-NOV					
VA0060500	8/10/2016	AMMONIA, AS N JUN-NOV				0	1
VA0060500	9/10/2016	AMMONIA, AS N JUN-NOV					
VA0060500	10/10/2016	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	11/10/2016	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	12/10/2016	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	7/10/2017	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	8/10/2017	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	9/10/2017	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	10/10/2017	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	11/10/2017	AMMONIA, AS N JUN-NOV					
VA0060500	12/10/2017	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	7/10/2018	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	8/10/2018	AMMONIA, AS N JUN-NOV				0.3	0.7
VA0060500	9/10/2018	AMMONIA, AS N JUN-NOV				<QL	<QL
VA0060500	10/10/2018	AMMONIA, AS N JUN-NOV				3	3
VA0060500	11/10/2018	AMMONIA, AS N JUN-NOV				3	2
VA0060500	12/10/2018	AMMONIA, AS N JUN-NOV				4.7	6.5
VA0060500	4/10/2014	BOD5	0.067	1.42		4.3	5.85
VA0060500	5/10/2014	BOD5	0.02	<QL		1.09	<QL
VA0060500	6/10/2014	BOD5	1.3	1.3		5.9	5.9
VA0060500	7/10/2014	BOD5	1	1.6		3.9	6.4
VA0060500	8/10/2014	BOD5	0.1	0.8		2.6	3.1
VA0060500	9/10/2014	BOD5	0.41	0.41		2.98	2.98
VA0060500	10/10/2014	BOD5					
VA0060500	11/10/2014	BOD5					

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	12/10/2014	BOD5					
VA0060500	1/10/2015	BOD5					
VA0060500	2/10/2015	BOD5	0.05	0.088		3.01	3.83
VA0060500	3/10/2015	BOD5	0.86	0.86		3.7	3.7
VA0060500	4/10/2015	BOD5	0.072	1.03		2.83	3.44
VA0060500	5/10/2015	BOD5					
VA0060500	6/10/2015	BOD5	0.7	0.8		3	3
VA0060500	7/10/2015	BOD5	0.4	0.5		1.7	2.8
VA0060500	8/10/2015	BOD5	<QL	<QL		<QL	<QL
VA0060500	9/10/2015	BOD5					
VA0060500	10/10/2015	BOD5	<QL	<QL		<QL	<QL
VA0060500	11/10/2015	BOD5	<QL	<QL		<QL	<QL
VA0060500	12/10/2015	BOD5					
VA0060500	1/10/2016	BOD5	0.3	0.7		1.4	2.8
VA0060500	2/10/2016	BOD5					
VA0060500	3/10/2016	BOD5	1	1.4		4	6
VA0060500	4/10/2016	BOD5	1.5	2.8		7.1	13.4
VA0060500	5/10/2016	BOD5	1.2	0.5		4.8	2.7
VA0060500	6/10/2016	BOD5	1.2	1.4		4.3	5.5
VA0060500	7/10/2016	BOD5					
VA0060500	8/10/2016	BOD5	0.2	0.4		1	2
VA0060500	9/10/2016	BOD5					
VA0060500	10/10/2016	BOD5	0.8	0.8		6	6
VA0060500	11/10/2016	BOD5	0.5	0.7		3	4
VA0060500	12/10/2016	BOD5	0.4	0.4		3	3
VA0060500	1/10/2017	BOD5	0.8	1.5		4	6
VA0060500	2/10/2017	BOD5	0.2	0.2		2	2
VA0060500	3/10/2017	BOD5	0.2	0.2		5	5
VA0060500	4/10/2017	BOD5					
VA0060500	5/10/2017	BOD5					
VA0060500	6/10/2017	BOD5	0.3	0.4		2	2
VA0060500	7/10/2017	BOD5	0.5	0.5		5	5
VA0060500	8/10/2017	BOD5	0.19	0.37		1	2
VA0060500	9/10/2017	BOD5	0.36	0.36		2	2
VA0060500	10/10/2017	BOD5	<QL	<QL		<QL	<QL
VA0060500	11/10/2017	BOD5					
VA0060500	12/10/2017	BOD5	0.3	0.7		2	4
VA0060500	1/10/2018	BOD5	0.3	0.5		2	3

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	2/10/2018	BOD5					
VA0060500	3/10/2018	BOD5	0.6	0.6		4	4
VA0060500	4/10/2018	BOD5					
VA0060500	5/10/2018	BOD5	0.7	1.4		4	7
VA0060500	6/10/2018	BOD5	0.7	0.8		3	4
VA0060500	7/10/2018	BOD5	1	1.3		5	6
VA0060500	8/10/2018	BOD5	0.7	0.8		4	4
VA0060500	9/10/2018	BOD5	0.3	<QL		2	<QL
VA0060500	10/10/2018	BOD5	0.9	1.3		4	6
VA0060500	11/10/2018	BOD5	1.86	0.36		3	2
VA0060500	12/10/2018	BOD5	0.7	0.7		3	3
VA0060500	1/10/2019	BOD5	0.7	1		5	7
VA0060500	2/10/2019	BOD5	1.4	1.9		7	9
VA0060500	3/10/2019	BOD5	1.2	1.1		6	7
VA0060500	4/10/2019	BOD5					
VA0060500	1/10/2016	BOD5, INFLUENT				215	215
VA0060500	1/10/2017	BOD5, INFLUENT				189	189
VA0060500	1/10/2018	BOD5, INFLUENT				119.5	119.5
VA0060500	1/10/2019	BOD5, INFLUENT				213.06	213.06
VA0060500	4/10/2014	CL2, INST RES MAX				<QL	<QL
VA0060500	5/10/2014	CL2, INST RES MAX				0	0
VA0060500	6/10/2014	CL2, INST RES MAX				<QL	<QL
VA0060500	7/10/2014	CL2, INST RES MAX				<QL	<QL
VA0060500	8/10/2014	CL2, INST RES MAX				<QL	<QL
VA0060500	9/10/2014	CL2, INST RES MAX				<QL	<QL
VA0060500	10/10/2014	CL2, INST RES MAX					
VA0060500	11/10/2014	CL2, INST RES MAX					
VA0060500	12/10/2014	CL2, INST RES MAX					
VA0060500	1/10/2015	CL2, INST RES MAX					
VA0060500	2/10/2015	CL2, INST RES MAX				<QL	<QL
VA0060500	3/10/2015	CL2, INST RES MAX				<QL	<QL
VA0060500	4/10/2015	CL2, INST RES MAX				<QL	<QL
VA0060500	5/10/2015	CL2, INST RES MAX					
VA0060500	6/10/2015	CL2, INST RES MAX				<QL	<QL
VA0060500	7/10/2015	CL2, INST RES MAX				<QL	<QL
VA0060500	8/10/2015	CL2, INST RES MAX				<QL	<QL
VA0060500	9/10/2015	CL2, INST RES MAX					
VA0060500	10/10/2015	CL2, INST RES MAX				<QL	<QL

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	11/10/2015	CL2, INST RES MAX				<QL	<QL
VA0060500	12/10/2015	CL2, INST RES MAX					
VA0060500	1/10/2016	CL2, INST RES MAX				<QL	<QL
VA0060500	2/10/2016	CL2, INST RES MAX					
VA0060500	3/10/2016	CL2, INST RES MAX				<QL	<QL
VA0060500	4/10/2016	CL2, INST RES MAX				<QL	<QL
VA0060500	5/10/2016	CL2, INST RES MAX				<QL	<QL
VA0060500	6/10/2016	CL2, INST RES MAX				<QL	<QL
VA0060500	7/10/2016	CL2, INST RES MAX					
VA0060500	8/10/2016	CL2, INST RES MAX				0	0
VA0060500	9/10/2016	CL2, INST RES MAX					
VA0060500	10/10/2016	CL2, INST RES MAX				<QL	<QL
VA0060500	11/10/2016	CL2, INST RES MAX				<QL	<QL
VA0060500	12/10/2016	CL2, INST RES MAX				<QL	<QL
VA0060500	1/10/2017	CL2, INST RES MAX				<QL	<QL
VA0060500	2/10/2017	CL2, INST RES MAX				<QL	<QL
VA0060500	3/10/2017	CL2, INST RES MAX				<QL	<QL
VA0060500	4/10/2017	CL2, INST RES MAX					
VA0060500	5/10/2017	CL2, INST RES MAX					
VA0060500	6/10/2017	CL2, INST RES MAX				<QL	<QL
VA0060500	7/10/2017	CL2, INST RES MAX				<QL	<QL
VA0060500	8/10/2017	CL2, INST RES MAX				<QL	<QL
VA0060500	9/10/2017	CL2, INST RES MAX				<QL	<QL
VA0060500	10/10/2017	CL2, INST RES MAX				<QL	<QL
VA0060500	11/10/2017	CL2, INST RES MAX					
VA0060500	12/10/2017	CL2, INST RES MAX				<QL	<QL
VA0060500	1/10/2018	CL2, INST RES MAX				<QL	<QL
VA0060500	2/10/2018	CL2, INST RES MAX					
VA0060500	3/10/2018	CL2, INST RES MAX				<QL	<QL
VA0060500	4/10/2018	CL2, INST RES MAX					
VA0060500	5/10/2018	CL2, INST RES MAX				<QL	<QL
VA0060500	6/10/2018	CL2, INST RES MAX				<QL	<QL
VA0060500	7/10/2018	CL2, INST RES MAX				<QL	<QL
VA0060500	8/10/2018	CL2, INST RES MAX				<QL	<QL
VA0060500	9/10/2018	CL2, INST RES MAX				<QL	<QL
VA0060500	10/10/2018	CL2, INST RES MAX				<QL	<QL
VA0060500	11/10/2018	CL2, INST RES MAX				<QL	<QL
VA0060500	12/10/2018	CL2, INST RES MAX				<QL	<QL

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	1/10/2019	CL2, INST RES MAX				<QL	<QL
VA0060500	2/10/2019	CL2, INST RES MAX				<QL	<QL
VA0060500	3/10/2019	CL2, INST RES MAX				<QL	<QL
VA0060500	4/10/2019	CL2, INST RES MAX					
VA0060500	4/10/2014	CL2, INST TECH MIN LIMIT			1.3		
VA0060500	5/10/2014	CL2, INST TECH MIN LIMIT			1.6		
VA0060500	6/10/2014	CL2, INST TECH MIN LIMIT			1.5		
VA0060500	7/10/2014	CL2, INST TECH MIN LIMIT			0.7		
VA0060500	8/10/2014	CL2, INST TECH MIN LIMIT			1		
VA0060500	9/10/2014	CL2, INST TECH MIN LIMIT			1		
VA0060500	10/10/2014	CL2, INST TECH MIN LIMIT					
VA0060500	11/10/2014	CL2, INST TECH MIN LIMIT					
VA0060500	12/10/2014	CL2, INST TECH MIN LIMIT					
VA0060500	1/10/2015	CL2, INST TECH MIN LIMIT					
VA0060500	2/10/2015	CL2, INST TECH MIN LIMIT			1.5		
VA0060500	3/10/2015	CL2, INST TECH MIN LIMIT			2.4		
VA0060500	4/10/2015	CL2, INST TECH MIN LIMIT			2.8		
VA0060500	5/10/2015	CL2, INST TECH MIN LIMIT					
VA0060500	6/10/2015	CL2, INST TECH MIN LIMIT			1.2		
VA0060500	7/10/2015	CL2, INST TECH MIN LIMIT			1		
VA0060500	8/10/2015	CL2, INST TECH MIN LIMIT			1		
VA0060500	9/10/2015	CL2, INST TECH MIN LIMIT					
VA0060500	10/10/2015	CL2, INST TECH MIN LIMIT			1		
VA0060500	11/10/2015	CL2, INST TECH MIN LIMIT			1.3		
VA0060500	12/10/2015	CL2, INST TECH MIN LIMIT					
VA0060500	1/10/2016	CL2, INST TECH MIN LIMIT			1.8		
VA0060500	2/10/2016	CL2, INST TECH MIN LIMIT					
VA0060500	3/10/2016	CL2, INST TECH MIN LIMIT			1.2		
VA0060500	4/10/2016	CL2, INST TECH MIN LIMIT			1.6		
VA0060500	5/10/2016	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	6/10/2016	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	7/10/2016	CL2, INST TECH MIN LIMIT					
VA0060500	8/10/2016	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	9/10/2016	CL2, INST TECH MIN LIMIT					
VA0060500	10/10/2016	CL2, INST TECH MIN LIMIT			1.2		
VA0060500	11/10/2016	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	12/10/2016	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	1/10/2017	CL2, INST TECH MIN LIMIT			1.1		

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	2/10/2017	CL2, INST TECH MIN LIMIT			2.1		
VA0060500	3/10/2017	CL2, INST TECH MIN LIMIT			1.2		
VA0060500	4/10/2017	CL2, INST TECH MIN LIMIT					
VA0060500	5/10/2017	CL2, INST TECH MIN LIMIT					
VA0060500	6/10/2017	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	7/10/2017	CL2, INST TECH MIN LIMIT			1.2		
VA0060500	8/10/2017	CL2, INST TECH MIN LIMIT			1		
VA0060500	9/10/2017	CL2, INST TECH MIN LIMIT			1		
VA0060500	10/10/2017	CL2, INST TECH MIN LIMIT			1		
VA0060500	11/10/2017	CL2, INST TECH MIN LIMIT					
VA0060500	12/10/2017	CL2, INST TECH MIN LIMIT			1		
VA0060500	1/10/2018	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	2/10/2018	CL2, INST TECH MIN LIMIT					
VA0060500	3/10/2018	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	4/10/2018	CL2, INST TECH MIN LIMIT					
VA0060500	5/10/2018	CL2, INST TECH MIN LIMIT			1.2		
VA0060500	6/10/2018	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	7/10/2018	CL2, INST TECH MIN LIMIT			1		
VA0060500	8/10/2018	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	9/10/2018	CL2, INST TECH MIN LIMIT			1		
VA0060500	10/10/2018	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	11/10/2018	CL2, INST TECH MIN LIMIT			<QL		
VA0060500	12/10/2018	CL2, INST TECH MIN LIMIT			1		
VA0060500	1/10/2019	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	2/10/2019	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	3/10/2019	CL2, INST TECH MIN LIMIT			1.1		
VA0060500	4/10/2019	CL2, INST TECH MIN LIMIT					
VA0060500	4/10/2014	CL2, TOTAL CONTACT			1.3		
VA0060500	5/10/2014	CL2, TOTAL CONTACT			1.6		
VA0060500	6/10/2014	CL2, TOTAL CONTACT			1.5		
VA0060500	7/10/2014	CL2, TOTAL CONTACT			0.7		
VA0060500	8/10/2014	CL2, TOTAL CONTACT			1		
VA0060500	9/10/2014	CL2, TOTAL CONTACT			1		
VA0060500	10/10/2014	CL2, TOTAL CONTACT					
VA0060500	11/10/2014	CL2, TOTAL CONTACT					
VA0060500	12/10/2014	CL2, TOTAL CONTACT					
VA0060500	1/10/2015	CL2, TOTAL CONTACT					
VA0060500	2/10/2015	CL2, TOTAL CONTACT			1.5		

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	3/10/2015	CL2, TOTAL CONTACT			2.4		
VA0060500	4/10/2015	CL2, TOTAL CONTACT			2.8		
VA0060500	5/10/2015	CL2, TOTAL CONTACT					
VA0060500	6/10/2015	CL2, TOTAL CONTACT			1.2		
VA0060500	7/10/2015	CL2, TOTAL CONTACT			1		
VA0060500	8/10/2015	CL2, TOTAL CONTACT			1		
VA0060500	9/10/2015	CL2, TOTAL CONTACT					
VA0060500	10/10/2015	CL2, TOTAL CONTACT			1		
VA0060500	11/10/2015	CL2, TOTAL CONTACT			1.3		
VA0060500	12/10/2015	CL2, TOTAL CONTACT					
VA0060500	1/10/2016	CL2, TOTAL CONTACT			1.8		
VA0060500	2/10/2016	CL2, TOTAL CONTACT					
VA0060500	3/10/2016	CL2, TOTAL CONTACT			1.2		
VA0060500	4/10/2016	CL2, TOTAL CONTACT			1.6		
VA0060500	5/10/2016	CL2, TOTAL CONTACT			1.1		
VA0060500	6/10/2016	CL2, TOTAL CONTACT			1.1		
VA0060500	7/10/2016	CL2, TOTAL CONTACT					
VA0060500	8/10/2016	CL2, TOTAL CONTACT			1.1		
VA0060500	9/10/2016	CL2, TOTAL CONTACT					
VA0060500	10/10/2016	CL2, TOTAL CONTACT			1.2		
VA0060500	11/10/2016	CL2, TOTAL CONTACT			1.1		
VA0060500	12/10/2016	CL2, TOTAL CONTACT			1.1		
VA0060500	1/10/2017	CL2, TOTAL CONTACT			1.1		
VA0060500	2/10/2017	CL2, TOTAL CONTACT			2.1		
VA0060500	3/10/2017	CL2, TOTAL CONTACT			1.2		
VA0060500	4/10/2017	CL2, TOTAL CONTACT					
VA0060500	5/10/2017	CL2, TOTAL CONTACT					
VA0060500	6/10/2017	CL2, TOTAL CONTACT			1.1		
VA0060500	7/10/2017	CL2, TOTAL CONTACT			1.2		
VA0060500	8/10/2017	CL2, TOTAL CONTACT			1		
VA0060500	9/10/2017	CL2, TOTAL CONTACT			1		
VA0060500	10/10/2017	CL2, TOTAL CONTACT			1		
VA0060500	11/10/2017	CL2, TOTAL CONTACT					
VA0060500	12/10/2017	CL2, TOTAL CONTACT			1		
VA0060500	1/10/2018	CL2, TOTAL CONTACT			1.1		
VA0060500	2/10/2018	CL2, TOTAL CONTACT					
VA0060500	3/10/2018	CL2, TOTAL CONTACT			1.1		
VA0060500	4/10/2018	CL2, TOTAL CONTACT					

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	5/10/2018	CL2, TOTAL CONTACT			1.2		
VA0060500	6/10/2018	CL2, TOTAL CONTACT			1.1		
VA0060500	7/10/2018	CL2, TOTAL CONTACT			1		
VA0060500	8/10/2018	CL2, TOTAL CONTACT			1.1		
VA0060500	9/10/2018	CL2, TOTAL CONTACT			1		
VA0060500	10/10/2018	CL2, TOTAL CONTACT			1.1		
VA0060500	11/10/2018	CL2, TOTAL CONTACT			1.1		
VA0060500	12/10/2018	CL2, TOTAL CONTACT			1		
VA0060500	1/10/2019	CL2, TOTAL CONTACT			1.1		
VA0060500	2/10/2019	CL2, TOTAL CONTACT			1.1		
VA0060500	3/10/2019	CL2, TOTAL CONTACT			1.1		
VA0060500	4/10/2019	CL2, TOTAL CONTACT					
VA0060500	4/10/2014	DO			10.3		
VA0060500	5/10/2014	DO			7		
VA0060500	6/10/2014	DO			6.8		
VA0060500	7/10/2014	DO			6.8		
VA0060500	8/10/2014	DO			6.8		
VA0060500	9/10/2014	DO			6.8		
VA0060500	10/10/2014	DO					
VA0060500	11/10/2014	DO					
VA0060500	12/10/2014	DO					
VA0060500	1/10/2015	DO					
VA0060500	2/10/2015	DO			10.2		
VA0060500	3/10/2015	DO			8.6		
VA0060500	4/10/2015	DO			7.1		
VA0060500	5/10/2015	DO					
VA0060500	6/10/2015	DO			7.2		
VA0060500	7/10/2015	DO			7		
VA0060500	8/10/2015	DO			7.1		
VA0060500	9/10/2015	DO					
VA0060500	10/10/2015	DO			7.3		
VA0060500	11/10/2015	DO			7.8		
VA0060500	12/10/2015	DO					
VA0060500	1/10/2016	DO			9.6		
VA0060500	2/10/2016	DO					
VA0060500	3/10/2016	DO			12.7		
VA0060500	4/10/2016	DO			7.8		
VA0060500	5/10/2016	DO			7.3		

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	6/10/2016	DO			7		
VA0060500	7/10/2016	DO					
VA0060500	8/10/2016	DO			6.9		
VA0060500	9/10/2016	DO					
VA0060500	10/10/2016	DO			6.8		
VA0060500	11/10/2016	DO			7.6		
VA0060500	12/10/2016	DO			7.1		
VA0060500	1/10/2017	DO			8.2		
VA0060500	2/10/2017	DO			9.9		
VA0060500	3/10/2017	DO			8.3		
VA0060500	4/10/2017	DO					
VA0060500	5/10/2017	DO					
VA0060500	6/10/2017	DO			6.9		
VA0060500	7/10/2017	DO			6.8		
VA0060500	8/10/2017	DO			6.9		
VA0060500	9/10/2017	DO			7		
VA0060500	10/10/2017	DO			7		
VA0060500	11/10/2017	DO					
VA0060500	12/10/2017	DO			8.2		
VA0060500	1/10/2018	DO			9.1		
VA0060500	2/10/2018	DO					
VA0060500	3/10/2018	DO			11.5		
VA0060500	4/10/2018	DO					
VA0060500	5/10/2018	DO			9.9		
VA0060500	6/10/2018	DO			6.9		
VA0060500	7/10/2018	DO			6.8		
VA0060500	8/10/2018	DO			6.8		
VA0060500	9/10/2018	DO			6.8		
VA0060500	10/10/2018	DO			6.8		
VA0060500	11/10/2018	DO			6.8		
VA0060500	12/10/2018	DO			6.8		
VA0060500	1/10/2019	DO			10.8		
VA0060500	2/10/2019	DO			12.2		
VA0060500	3/10/2019	DO			11.2		
VA0060500	4/10/2019	DO					
VA0060500	4/10/2014	E.COLI				<QL	
VA0060500	5/10/2014	E.COLI				1	
VA0060500	6/10/2014	E.COLI				<QL	

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	7/10/2014	E.COLI				2	
VA0060500	8/10/2014	E.COLI				2	
VA0060500	9/10/2014	E.COLI				<QL	
VA0060500	10/10/2014	E.COLI					
VA0060500	11/10/2014	E.COLI					
VA0060500	12/10/2014	E.COLI					
VA0060500	1/10/2015	E.COLI					
VA0060500	2/10/2015	E.COLI				<QL	
VA0060500	3/10/2015	E.COLI				<QL	
VA0060500	4/10/2015	E.COLI				<QL	
VA0060500	5/10/2015	E.COLI					
VA0060500	6/10/2015	E.COLI				9	
VA0060500	7/10/2015	E.COLI				<1	
VA0060500	8/10/2015	E.COLI				1	
VA0060500	9/10/2015	E.COLI					
VA0060500	10/10/2015	E.COLI				1	
VA0060500	11/10/2015	E.COLI				1	
VA0060500	12/10/2015	E.COLI					
VA0060500	1/10/2016	E.COLI				<1	
VA0060500	2/10/2016	E.COLI					
VA0060500	3/10/2016	E.COLI				<1	
VA0060500	4/10/2016	E.COLI				1	
VA0060500	5/10/2016	E.COLI				<1	
VA0060500	6/10/2016	E.COLI				<1	
VA0060500	7/10/2016	E.COLI					
VA0060500	8/10/2016	E.COLI				1	
VA0060500	9/10/2016	E.COLI					
VA0060500	10/10/2016	E.COLI				1	
VA0060500	11/10/2016	E.COLI				<QL	
VA0060500	12/10/2016	E.COLI				<1	
VA0060500	1/10/2017	E.COLI				<1	
VA0060500	2/10/2017	E.COLI				1	
VA0060500	3/10/2017	E.COLI				1	
VA0060500	4/10/2017	E.COLI					
VA0060500	5/10/2017	E.COLI					
VA0060500	6/10/2017	E.COLI				1	
VA0060500	7/10/2017	E.COLI				13	
VA0060500	8/10/2017	E.COLI				1	

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	9/10/2017	E.COLI				1	
VA0060500	10/10/2017	E.COLI				1	
VA0060500	11/10/2017	E.COLI					
VA0060500	12/10/2017	E.COLI				1	
VA0060500	1/10/2018	E.COLI				1	
VA0060500	2/10/2018	E.COLI					
VA0060500	3/10/2018	E.COLI				1	
VA0060500	4/10/2018	E.COLI					
VA0060500	5/10/2018	E.COLI				1	
VA0060500	6/10/2018	E.COLI				1	
VA0060500	7/10/2018	E.COLI				1	
VA0060500	8/10/2018	E.COLI				1	
VA0060500	9/10/2018	E.COLI				1	
VA0060500	10/10/2018	E.COLI				1	
VA0060500	11/10/2018	E.COLI				1	
VA0060500	12/10/2018	E.COLI				1	
VA0060500	1/10/2019	E.COLI				1	
VA0060500	2/10/2019	E.COLI				2	
VA0060500	3/10/2019	E.COLI				1	
VA0060500	4/10/2019	E.COLI					
VA0060500	4/10/2014	FLOW	0.048	0.068			
VA0060500	5/10/2014	FLOW	0.043	0.073			
VA0060500	6/10/2014	FLOW	0.03	0.131			
VA0060500	7/10/2014	FLOW	0.06	0.1			
VA0060500	8/10/2014	FLOW	0.023	0.071			
VA0060500	9/10/2014	FLOW	0.02	0.04			
VA0060500	10/10/2014	FLOW					
VA0060500	11/10/2014	FLOW					
VA0060500	12/10/2014	FLOW					
VA0060500	1/10/2015	FLOW					
VA0060500	2/10/2015	FLOW	0.022	0.124			
VA0060500	3/10/2015	FLOW	0.057	0.073			
VA0060500	4/10/2015	FLOW	0.027	0.091			
VA0060500	5/10/2015	FLOW					
VA0060500	6/10/2015	FLOW	0.052	0.086			
VA0060500	7/10/2015	FLOW	0.043	0.062			
VA0060500	8/10/2015	FLOW	0.042	0.063			
VA0060500	9/10/2015	FLOW					

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	10/10/2015	FLOW	0.04	0.053			
VA0060500	11/10/2015	FLOW	0.049	0.065			
VA0060500	12/10/2015	FLOW					
VA0060500	1/10/2016	FLOW	0.056	0.066			
VA0060500	2/10/2016	FLOW					
VA0060500	3/10/2016	FLOW	0.062	0.109			
VA0060500	4/10/2016	FLOW	0.051	0.072			
VA0060500	5/10/2016	FLOW	0.051	0.069			
VA0060500	6/10/2016	FLOW	0.058	0.091			
VA0060500	7/10/2016	FLOW					
VA0060500	8/10/2016	FLOW	0.044	0.062			
VA0060500	9/10/2016	FLOW					
VA0060500	10/10/2016	FLOW	0.035	0.047			
VA0060500	11/10/2016	FLOW	0.035	0.049			
VA0060500	12/10/2016	FLOW	0.03	0.042			
VA0060500	1/10/2017	FLOW	0.032	0.061			
VA0060500	2/10/2017	FLOW	0.022	0.03			
VA0060500	3/10/2017	FLOW	0.014	0.018			
VA0060500	4/10/2017	FLOW					
VA0060500	5/10/2017	FLOW					
VA0060500	6/10/2017	FLOW	0.025	0.059			
VA0060500	7/10/2017	FLOW	0.005	0.032			
VA0060500	8/10/2017	FLOW	0.023	0.065			
VA0060500	9/10/2017	FLOW	0.008	0.047			
VA0060500	10/10/2017	FLOW	0.019	0.051			
VA0060500	11/10/2017	FLOW					
VA0060500	12/10/2017	FLOW	0.019	0.048			
VA0060500	1/10/2018	FLOW	0.026	0.058			
VA0060500	2/10/2018	FLOW					
VA0060500	3/10/2018	FLOW	0.036	0.048			
VA0060500	4/10/2018	FLOW					
VA0060500	5/10/2018	FLOW	0.021	0.063			
VA0060500	6/10/2018	FLOW	0.039	0.096			
VA0060500	7/10/2018	FLOW	0.047	0.056			
VA0060500	8/10/2018	FLOW	0.047	0.059			
VA0060500	9/10/2018	FLOW	0.052	0.068			
VA0060500	10/10/2018	FLOW	0.055	0.075			
VA0060500	11/10/2018	FLOW	0.049	0.068			

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	12/10/2018	FLOW	0.051	0.073			
VA0060500	1/10/2019	FLOW	0.047	0.062			
VA0060500	2/10/2019	FLOW	0.05	0.065			
VA0060500	3/10/2019	FLOW	0.046	0.061			
VA0060500	4/10/2019	FLOW					
VA0060500	4/10/2014	pH			6.9		8.4
VA0060500	5/10/2014	pH			6.9		7.4
VA0060500	6/10/2014	pH			6.9		7.4
VA0060500	7/10/2014	pH			7		7.5
VA0060500	8/10/2014	pH			7.1		7.7
VA0060500	9/10/2014	pH			6.9		7.9
VA0060500	10/10/2014	pH					
VA0060500	11/10/2014	pH					
VA0060500	12/10/2014	pH					
VA0060500	1/10/2015	pH					
VA0060500	2/10/2015	pH			7.1		7.9
VA0060500	3/10/2015	pH			7.3		7.6
VA0060500	4/10/2015	pH			7.2		7.7
VA0060500	5/10/2015	pH					
VA0060500	6/10/2015	pH			7.1		7.6
VA0060500	7/10/2015	pH			6.8		7.3
VA0060500	8/10/2015	pH			6.7		7.4
VA0060500	9/10/2015	pH					
VA0060500	10/10/2015	pH			7		7.6
VA0060500	11/10/2015	pH			6.8		7.4
VA0060500	12/10/2015	pH					
VA0060500	1/10/2016	pH			6.8		7.4
VA0060500	2/10/2016	pH					
VA0060500	3/10/2016	pH			7.1		8
VA0060500	4/10/2016	pH			7		7.5
VA0060500	5/10/2016	pH			7.1		7.9
VA0060500	6/10/2016	pH			7		7.7
VA0060500	7/10/2016	pH					
VA0060500	8/10/2016	pH			7.1		7.4
VA0060500	9/10/2016	pH					
VA0060500	10/10/2016	pH			6.9		7.9
VA0060500	11/10/2016	pH			6.9		7.9
VA0060500	12/10/2016	pH			6.8		7.5

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	1/10/2017	pH			6.8		7.4
VA0060500	2/10/2017	pH			7		7.6
VA0060500	3/10/2017	pH			7		7.3
VA0060500	4/10/2017	pH					
VA0060500	5/10/2017	pH					
VA0060500	6/10/2017	pH			6.9		7.6
VA0060500	7/10/2017	pH			6.9		7.5
VA0060500	8/10/2017	pH			6.8		7.3
VA0060500	9/10/2017	pH			6.7		7
VA0060500	10/10/2017	pH			6.7		7.2
VA0060500	11/10/2017	pH					
VA0060500	12/10/2017	pH			6.7		7.2
VA0060500	1/10/2018	pH			6.7		7.7
VA0060500	2/10/2018	pH					
VA0060500	3/10/2018	pH			6.6		7.5
VA0060500	4/10/2018	pH					
VA0060500	5/10/2018	pH			7.2		8.1
VA0060500	6/10/2018	pH			6.8		7.6
VA0060500	7/10/2018	pH			6.9		8
VA0060500	8/10/2018	pH			6.6		7.8
VA0060500	9/10/2018	pH			6.7		7.2
VA0060500	10/10/2018	pH			6.8		7.3
VA0060500	11/10/2018	pH			6.8		7.2
VA0060500	12/10/2018	pH			6.8		7.6
VA0060500	1/10/2019	pH			6.8		7.6
VA0060500	2/10/2019	pH			7.1		7.8
VA0060500	3/10/2019	pH			7.1		7.5
VA0060500	4/10/2019	pH					
VA0060500	4/10/2014	TSS	0.072	0.96		3.5	4
VA0060500	5/10/2014	TSS	0.1	0.1		3.3	3.4
VA0060500	6/10/2014	TSS	0.06	0.6		2.1	2.7
VA0060500	7/10/2014	TSS	2	4		7.2	11.3
VA0060500	8/10/2014	TSS	0.1	1.3		4.9	6
VA0060500	9/10/2014	TSS	0.38	0.71		2.8	4.8
VA0060500	10/10/2014	TSS					
VA0060500	11/10/2014	TSS					
VA0060500	12/10/2014	TSS					
VA0060500	1/10/2015	TSS					

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	2/10/2015	TSS	0.1	1.59		5.5	6
VA0060500	3/10/2015	TSS	1.3	1.3		5.3	5.3
VA0060500	4/10/2015	TSS	2.01	4		7.8	13.33
VA0060500	5/10/2015	TSS					
VA0060500	6/10/2015	TSS	1.9	3.8		8	16
VA0060500	7/10/2015	TSS	1	1.2		5.2	6.4
VA0060500	8/10/2015	TSS	0.6	0.9		3.7	4.8
VA0060500	9/10/2015	TSS					
VA0060500	10/10/2015	TSS	0.4	0.5		2.2	2.7
VA0060500	11/10/2015	TSS	0.7	0.9		3.4	4.6
VA0060500	12/10/2015	TSS					
VA0060500	1/10/2016	TSS	1.5	1.7		7.1	7.3
VA0060500	2/10/2016	TSS					
VA0060500	3/10/2016	TSS	1.9	3.1		8	13
VA0060500	4/10/2016	TSS	3.8	5.2		20.8	33
VA0060500	5/10/2016	TSS	2.5	1.9		10.7	9.3
VA0060500	6/10/2016	TSS	3.8	4.4		14	18
VA0060500	7/10/2016	TSS					
VA0060500	8/10/2016	TSS	0.8	1		4	5
VA0060500	9/10/2016	TSS					
VA0060500	10/10/2016	TSS	1.4	1.4		10	10
VA0060500	11/10/2016	TSS	1.2	2.1		8	13
VA0060500	12/10/2016	TSS	1.5	1.5		12	12
VA0060500	1/10/2017	TSS	4.9	6.4		24	32
VA0060500	2/10/2017	TSS	0.3	0.3		3	3
VA0060500	3/10/2017	TSS	0.9	0.9		22	22
VA0060500	4/10/2017	TSS					
VA0060500	5/10/2017	TSS					
VA0060500	6/10/2017	TSS	1.4	1.5		9	9
VA0060500	7/10/2017	TSS	0.5	0.5		4	4
VA0060500	8/10/2017	TSS	1	1.1		6	6
VA0060500	9/10/2017	TSS	0.7	0.7		4	4
VA0060500	10/10/2017	TSS	1	1.1		6	6
VA0060500	11/10/2017	TSS					
VA0060500	12/10/2017	TSS	0.9	1		6	6
VA0060500	1/10/2018	TSS	1.1	1.6		9	10
VA0060500	2/10/2018	TSS					
VA0060500	3/10/2018	TSS	2.3	2.3		17	17

Permit Number	Due Date	Par Description	Quantity Average	Quantity Maximum	Concentration Min	Concentration Average	Concentration Max
VA0060500	4/10/2018	TSS					
VA0060500	5/10/2018	TSS	3.4	4.3		19	23
VA0060500	6/10/2018	TSS	3	3.6		16	17
VA0060500	7/10/2018	TSS	1.9	2.4		10	12
VA0060500	8/10/2018	TSS	1.3	1.5		7	8
VA0060500	9/10/2018	TSS	1.3	1.4		6	7
VA0060500	10/10/2018	TSS	1.8	2.2		8	10
VA0060500	11/10/2018	TSS	2.4	2.8		12	14
VA0060500	12/10/2018	TSS	3.8	3.9		18	18
VA0060500	1/10/2019	TSS	3.2	4.5		20	23
VA0060500	2/10/2019	TSS	4.4	4.5		22	21
VA0060500	3/10/2019	TSS	5.8	9.7		32	50
VA0060500	4/10/2019	74/10/2014					
VA0060500	1/10/2016	TSS, INFLUENT				204	204
VA0060500	1/10/2017	TSS, INFLUENT				180	180
VA0060500	1/10/2018	TSS, INFLUENT				112	112
VA0060500	1/10/2019	TSS, INFLUENT				245	245

Permit Number	Due Date	Par Description	Concentration Average	Concentration Max
VA0060500	4/10/2014	BOD5	4.3	5.85
VA0060500	5/10/2014	BOD5	1.09	<QL
VA0060500	6/10/2014	BOD5	5.9	5.9
VA0060500	7/10/2014	BOD5	3.9	6.4
VA0060500	8/10/2014	BOD5	2.6	3.1
VA0060500	9/10/2014	BOD5	2.98	2.98
VA0060500	2/10/2015	BOD5	3.01	3.83
VA0060500	3/10/2015	BOD5	3.7	3.7
VA0060500	4/10/2015	BOD5	2.83	3.44
VA0060500	6/10/2015	BOD5	3	3
VA0060500	7/10/2015	BOD5	1.7	2.8
VA0060500	8/10/2015	BOD5	<QL	<QL
VA0060500	10/10/2015	BOD5	<QL	<QL
VA0060500	11/10/2015	BOD5	<QL	<QL
VA0060500	1/10/2016	BOD5	1.4	2.8
VA0060500	3/10/2016	BOD5	4	6
VA0060500	4/10/2016	BOD5	7.1	13.4
VA0060500	5/10/2016	BOD5	4.8	2.7
VA0060500	6/10/2016	BOD5	4.3	5.5
VA0060500	8/10/2016	BOD5	1	2
VA0060500	10/10/2016	BOD5	6	6
VA0060500	11/10/2016	BOD5	3	4
VA0060500	12/10/2016	BOD5	3	3
VA0060500	1/10/2017	BOD5	4	6
VA0060500	2/10/2017	BOD5	2	2
VA0060500	3/10/2017	BOD5	5	5
VA0060500	6/10/2017	BOD5	2	2
VA0060500	7/10/2017	BOD5	5	5
VA0060500	8/10/2017	BOD5	1	2
VA0060500	9/10/2017	BOD5	2	2
VA0060500	10/10/2017	BOD5	<QL	<QL
VA0060500	12/10/2017	BOD5	2	4
VA0060500	1/10/2018	BOD5	2	3
VA0060500	3/10/2018	BOD5	4	4
VA0060500	5/10/2018	BOD5	4	7
VA0060500	6/10/2018	BOD5	3	4
VA0060500	7/10/2018	BOD5	5	6
VA0060500	8/10/2018	BOD5	4	4
VA0060500	9/10/2018	BOD5	2	<QL
VA0060500	10/10/2018	BOD5	4	6
VA0060500	11/10/2018	BOD5	3	2
VA0060500	12/10/2018	BOD5	3	3
VA0060500	1/10/2019	BOD5	5	7
VA0060500	2/10/2019	BOD5	7	9
VA0060500	3/10/2019	BOD5	6	7
VA0060500	1/10/2016	BOD5, INFLUENT	215	215
VA0060500	1/10/2017	BOD5, INFLUENT	189	189
VA0060500	1/10/2018	BOD5, INFLUENT	119.5	119.5
VA0060500	1/10/2019	BOD5, INFLUENT	213.06	213.06

	Average	Max
BOD5 Effluent	3.53	4.52
BOD5 Influent	184.14	184.14
% Removal	98%	98%

Permit Number	Due Date	Par Description	Concentration Average	Concentration Max	
VA0060500	4/10/2014	TSS	3.5	4	TSS Effluent
VA0060500	5/10/2014	TSS	3.3	3.4	TSS Influent
VA0060500	6/10/2014	TSS	2.1	2.7	% Removal
VA0060500	7/10/2014	TSS	7.2	11.3	
VA0060500	8/10/2014	TSS	4.9	6	
VA0060500	9/10/2014	TSS	2.8	4.8	
VA0060500	2/10/2015	TSS	5.5	6	
VA0060500	3/10/2015	TSS	5.3	5.3	
VA0060500	4/10/2015	TSS	7.8	13.33	
VA0060500	6/10/2015	TSS	8	16	
VA0060500	7/10/2015	TSS	5.2	6.4	
VA0060500	8/10/2015	TSS	3.7	4.8	
VA0060500	10/10/2015	TSS	2.2	2.7	
VA0060500	11/10/2015	TSS	3.4	4.6	
VA0060500	1/10/2016	TSS	7.1	7.3	
VA0060500	3/10/2016	TSS	8	13	
VA0060500	4/10/2016	TSS	20.8	33	
VA0060500	5/10/2016	TSS	10.7	9.3	
VA0060500	6/10/2016	TSS	14	18	
VA0060500	8/10/2016	TSS	4	5	
VA0060500	10/10/2016	TSS	10	10	
VA0060500	11/10/2016	TSS	8	13	
VA0060500	12/10/2016	TSS	12	12	
VA0060500	1/10/2017	TSS	24	32	
VA0060500	2/10/2017	TSS	3	3	
VA0060500	3/10/2017	TSS	22	22	
VA0060500	6/10/2017	TSS	9	9	
VA0060500	7/10/2017	TSS	4	4	
VA0060500	8/10/2017	TSS	6	6	
VA0060500	9/10/2017	TSS	4	4	
VA0060500	10/10/2017	TSS	6	6	
VA0060500	12/10/2017	TSS	6	6	
VA0060500	1/10/2018	TSS	9	10	
VA0060500	3/10/2018	TSS	17	17	
VA0060500	5/10/2018	TSS	19	23	
VA0060500	6/10/2018	TSS	16	17	
VA0060500	7/10/2018	TSS	10	12	
VA0060500	8/10/2018	TSS	7	8	
VA0060500	9/10/2018	TSS	6	7	
VA0060500	10/10/2018	TSS	8	10	
VA0060500	11/10/2018	TSS	12	14	
VA0060500	12/10/2018	TSS	18	18	
VA0060500	1/10/2019	TSS	20	23	
VA0060500	2/10/2019	TSS	22	21	
VA0060500	3/10/2019	TSS	32	50	
VA0060500	1/10/2016	TSS, INFLUENT	204	204	
VA0060500	1/10/2017	TSS, INFLUENT	180	180	
VA0060500	1/10/2018	TSS, INFLUENT	112	112	
VA0060500	1/10/2019	TSS, INFLUENT	245	245	

Average	Max
9.77	11.87
185.25	185.25
95%	94%

Attachment 10 – Mixing Analysis

Attachment 10 - MIX - Low Flow_2019.txt

Mixing Zone Predictions for

Waterford STP

Effluent Flow = 0.058 MGD
Stream 7Q10 = 0.15 MGD
Stream 30Q10 = 0.35 MGD
Stream 1Q10 = 0.12 MGD
Stream slope = 0.002 ft/ft
Stream width = 15 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .1357 ft
Length = 1121.93 ft
Velocity = .1581 ft/sec
Residence Time = .0821 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .2035 ft
Length = 796.93 ft
Velocity = .2063 ft/sec
Residence Time = .0447 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .1236 ft

Attachment 10 - MIX - Low Flow_2019.txt

Length = 1213.73 ft
Velocity = .1487 ft/sec
Residence Time = 2.268 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 44.09% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Attachment 10 - MIX - High Flow_2019.txt

Mixing Zone Predictions for

Waterford STP

Effluent Flow = 0.058 MGD
Stream 7Q10 = 1.91 MGD
Stream 30Q10 = 3.03 MGD
Stream 1Q10 = 1.48 MGD
Stream slope = 0.002 ft/ft
Stream width = 15 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .5335 ft
Length = 346.4 ft
Velocity = .3806 ft/sec
Residence Time = .0105 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .7051 ft
Length = 270.75 ft
Velocity = .452 ft/sec
Residence Time = .0069 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .4584 ft

Attachment 10 - MIX - High Flow_2019.txt

Length = 395.58 ft
Velocity = .3462 ft/sec
Residence Time = .3174 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Attachment 11 – Ammonia Limit Calculation

a. 2019 Reissuance

Attachment 11 - STATS, Ammonia - yearly.txt

8/22/2019 1:42:51 PM

Facility = Waterford STP
Chemical = Ammonia
Chronic averaging period = 30
WLAa = 31.4
WLAc = 14.7
Q.L. = .2
samples/mo. = 4
samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average = 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

Attachment 11 – Ammonia Limit Calculation

b. 2014 Reissuance

11/25/2013 10:58:59 AM

Facility = Waterford (June - November)

Chemical = Ammonia

Chronic averaging period = 30

WLAa = 26.2

WLAc = 8.69

Q.L. = .2

samples/mo. = 4

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 17.5335531117877

Average Weekly limit = 17.5335531117877

Average Monthly Limit = 11.9881412581154

The data are:

Attachment 12 – Total Residual Chlorine Limit Calculation

Facility = Waterford
Chemical = Total Residual Chlorine
Chronic averaging period = 4
WLAa = 36
WLAc = 38
Q.L. = 100
samples/mo. = 90
samples/wk. = 23

Summary of Statistics:

observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683
97th percentile 4 day average = 332.758
97th percentile 30 day average = 241.210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 36
Average Weekly limit = 18.5574819741015
Average Monthly Limit = 16.5539762328594

The data are:

200

Attachment 13 – Dissolved Oxygen Modeling, October 1973

Shirley

Commonwealth of Virginia
STATE WATER CONTROL BOARD

P. O. Box 11143, 2111 N. Hamilton St., Richmond, Va. 22230 (804) 770-2241



Please Reply To: Northern Virginia Regional Office
P. O. Box 307
Springfield, Virginia 22150

5515 Cherokee Avenue, Suite 404
Alexandria, Virginia 22312
(703) 750-9111

October 23, 1973

Rotomoc
Bosin
Loudoun Co.

BOARD MEMBERS

Norman M. Cole,
Chairman
Denis J. Brion
Ray W. Edward
Henry S. Holland
Mrs. Wayne Jack
Andrew W. McTher
Robert W. Spess

Charlie,

According to my calculations, 24 mg/l in the final effluent will not be sufficient. 91% is marginal. 92% works out. Give me a call this afternoon if you wish to discuss this. *

19.2 mg/L

6/2/93

Lac

Gary
Gary

90% BOD removal

Lac 6/2/93

South Fork Catoclin Creek at the Route 662 Bridge

Depth 6"-24"
Width 25 ft.
Flow 1 ft. per 5 sec.
Air Temp. 23°C
Water Temp. 50°F
DO. 7.7 mg/l

GMM/rd

* Although the model indicates an effluent limitation of 19.2 mg/l BOD₅, the permit was issued with a BOD₅ effluent limitation of 24 mg/l.

The effluent limitation of 24 mg/l has not degraded water quality in the receiving stream and will remain in the permit.

6/2/93 Lac

Attachment 10

MEMORANDUM

State Water Control Board

2111 North Hamilton Street

P. O. Box 11143

Richmond, VA. 2323

SUBJECT: Waterford STP SAA

TO:

FROM: John McClain and Gary Moore

DATE: October 23, 1973

COPIES:

D.A. above POD on South Fork = 27.56 mi.²

D.A. of North Fork above the confluence of North Fork and South Fork = 18.15 mi.²

D.A. between POD and confluence of North and South Forks of Catoclin Creek = .91 mi.²

Critical discharge = .007 cfs/sq.mi. (Goose Creek near Leesburg)

*Q of South Fork Catoclin Creek at POD = .1244 MGD

Q of North Fork at confluence with South Fork = .0819 MGD

Q of South Fork between POD and confluence of North and South Forks = .0041 MGD

Distance from POD to confluence of North and South Forks = 1.2 mi.

Slope between POD to confluence of North and South Forks = 10/6336 = .0015 ft/ft

Velocity of Catoclin Creek = .2 ft. sec.⁻¹

Ka_{30} South Fork = $Ka_{20} * 1.22 = 1.5 * 1.22 = 1.83 \text{ day}^{-1}$

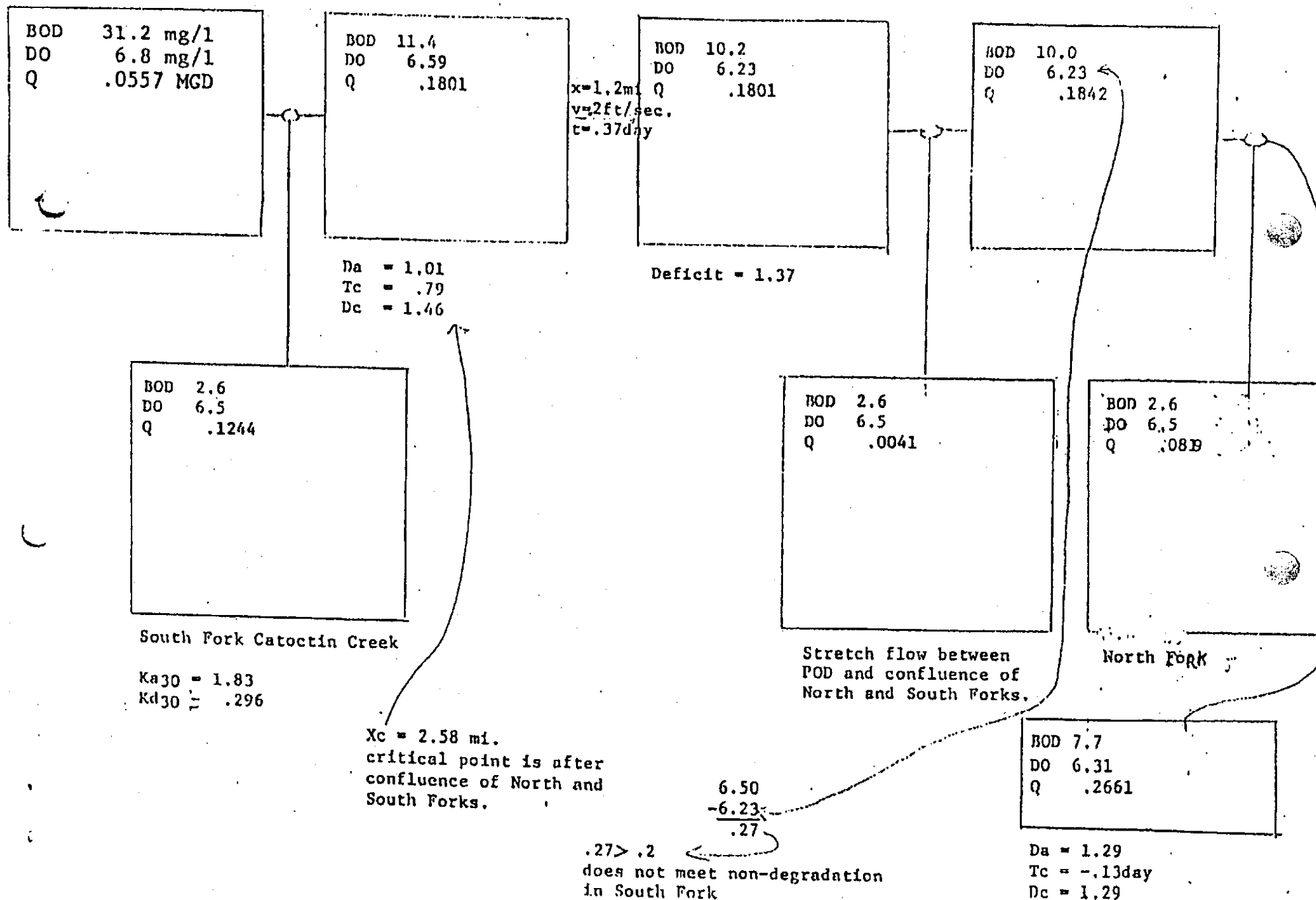
$Kd_{30} = Kd_{20} * 1.48 = 2 * 1.48 = .296 \text{ day}^{-1}$

* $7Q_{10} = 0.1244 \text{ MGD}$. The new $7Q_{10}$ (1993) is 0.37 MGD.

GM:by

90% BOD Removal = 24mg/l
 90% D.O. Saturation in effluent

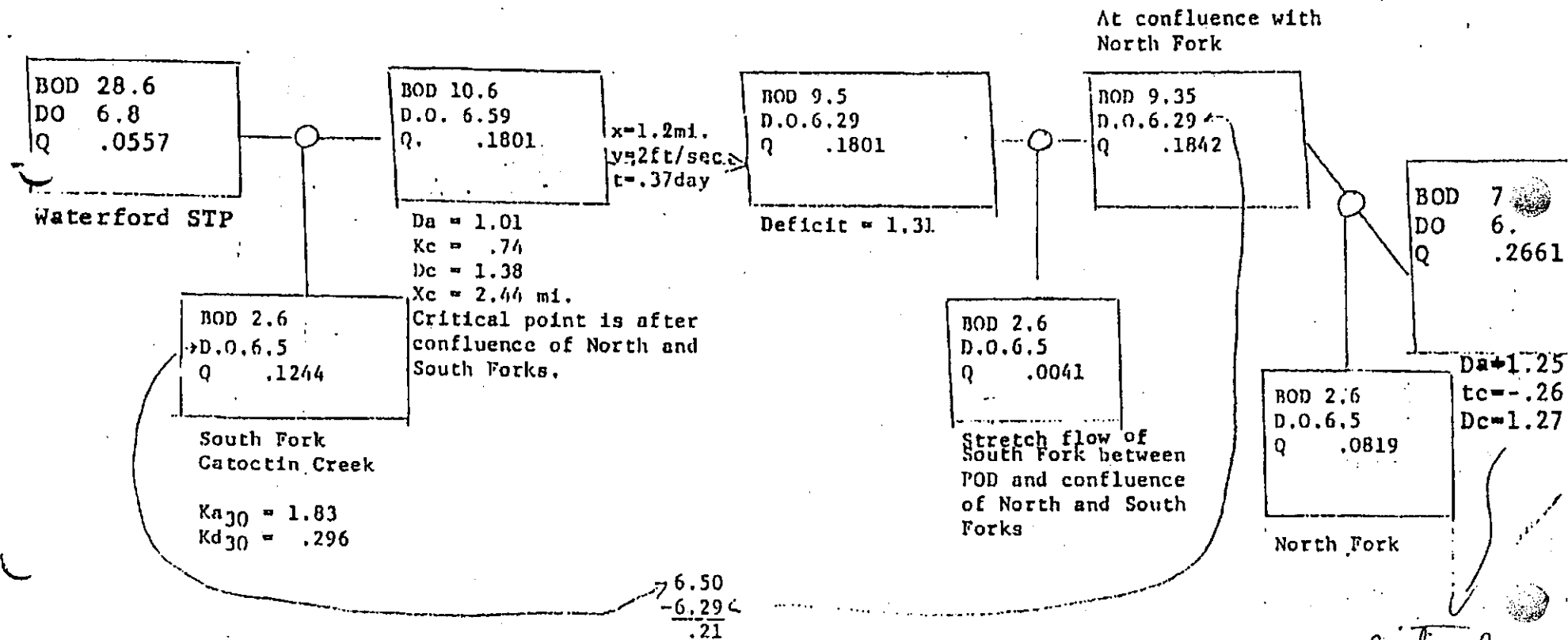
FLOW DIAGRAM FOR WATERFORD STP PROPOSAL



91% Removal = 22mg/l BOD
90% D.O. Saturation = 6.8mg/l

WATERFORD STP

2



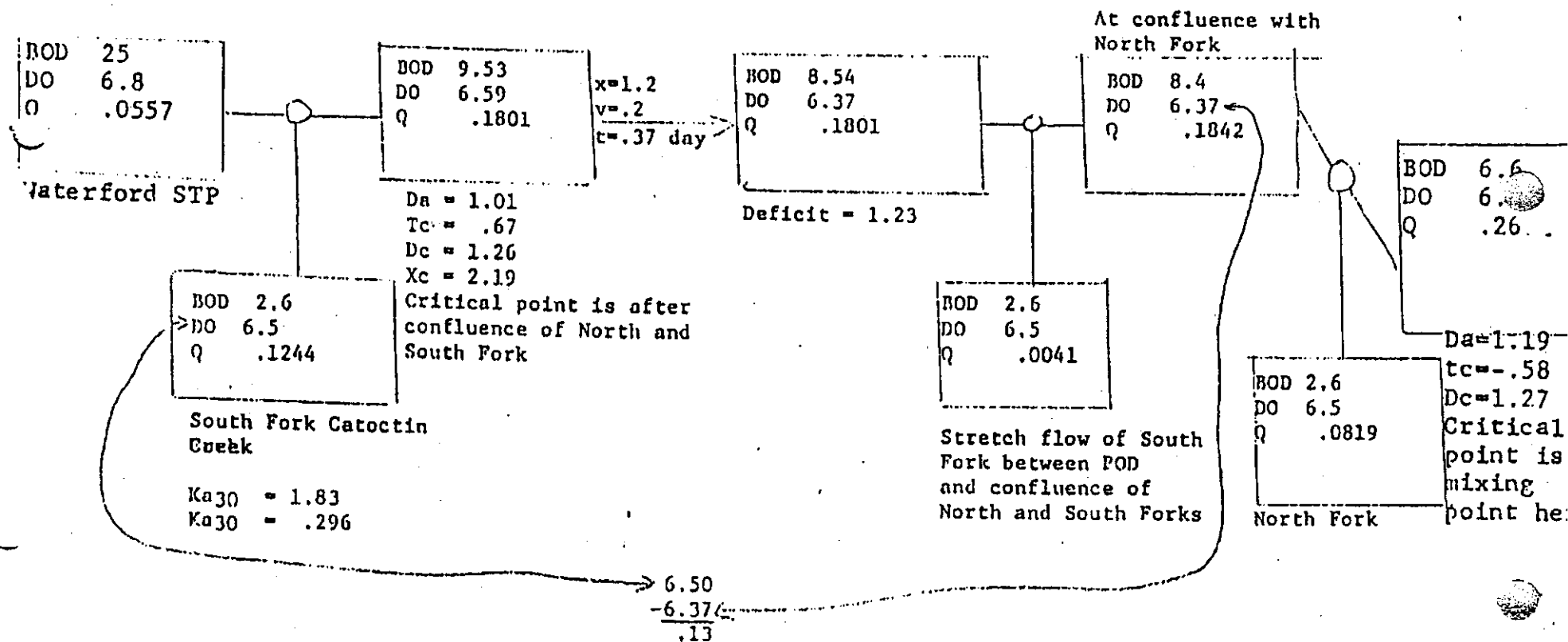
.21 > .2 does not meet
non-degradation in South Fork

92% Removal=19.2 mg/l BOD in effluent

WATERFORD STP

3

90% DO Saturation in effluent
6.8mg/l



meets non-degradation in South Fork.

Attachment 14 – Public Notice

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Loudoun County, Virginia.

PUBLIC COMMENT PERIOD: November 23, 2019 to December 27, 2019

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board.

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Loudoun County Sanitation Authority d.b.a. Loudoun Water, PO Box 4000, Ashburn, VA 20146, VA0060500

NAME AND ADDRESS OF FACILITY: Waterford Sewage Treatment Plant, 40024 Old Wheatland Rd., Waterford, VA 20197

PROJECT DESCRIPTION: Loudoun County Sanitation Authority d.b.a. Loudoun Water has applied for a reissuance of a permit for the public Waterford Sewage Treatment Plant. The applicant proposes to release treated sewage wastewaters from residential areas at a rate of 0.058 million gallons per day into a water body. Sludge from the treatment process will be hauled to Broad Run Reclamation Facility for disposal. The facility proposes to release the treated sewage wastewater in the South Fork of the Catoctin Creek in Loudoun County in the Potomac River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, biochemical oxygen demand, total suspended solids, dissolved oxygen, ammonia, *E. coli*, total residual chlorine. The permit requires monitoring without limitation for the following: flow, nitrate+nitrite, total Kjeldahl nitrogen, total nitrogen, total phosphorus.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, e-mail or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.

Name: Caitlin Shipman

Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193

Phone: (703) 583-3859 E-mail: caitlin.shipman@deq.virginia.gov