VERMONT

Vermont Department of Environmental Conservation
Watershed Management Division
1 National Life Drive, Davis Building 3rd Fl
Montpelier VT 05620-3522

Agency of Natural Resources

[phone] 802-828-1535

July 21, 2021

Dear City of Winooski:

Based on comments received for other permits posted publicly near the same time the NPDES Direct Discharge Permit 3-1248 was posted, the following changes have been made in the Final Permit, and that were not included in the Responsiveness Summary for comments received specifically for this permit.

1. Weekly sampling for Total Nitrogen, Total Kjeldahl Nitrogen, and Total Nitrate Plus Nitrite from June through October effluent limitations in Condition I.A.1 within the Draft Permit specified values for both mass and concentration samples were to be reported as monthly average and weekly maximum. The Final Permit was revised to require weekly monitoring from June through October for these nitrogenous constituents to be reported as monthly average and daily maximum mass and concentration values. Parts V.C.1-3 of the Fact Sheet were revised to specify the changes made.

2. Condition I.A.1 effluent monitoring conditions for Total Phosphorus was corrected to reflect the Total Monthly Pounds, Running Total Annual Pounds, and Percentage of Running Total Annual Pounds to Annual Permit Limitation. Previously, this condition incorrectly stated annual running total pounds, monthly average pounds, and monthly average concentration.

3. Total Nitrogen effluent limitation sampling types in Condition I.A.1 was changed from “8-hour Composite” to “Calculated”.

4. Condition A.I.2.a was revised to remove dechlorination from the facility process, as this facility is not equipped to dechlorinate.

5. The Agency removed Draft Permit Condition I.A.3.g., as the Permit and RPD include other provisions that apply the associated aspects of the 2017 Vermont Water Quality Standards (VWQS), including standards and criteria for toxic substances and protection of human health, aquatic biota, and wildlife. See VWQS § 29A-303(7) and Appendix C; Permit toxic effluent limitations, Final Permit Condition I.A.3.e (discharge shall not cause violation of VWQS), II.A.7. (toxic effluent standards), and II.A.8. (discharge of other substances identified in application and not known to Applicant to be toxic), as well as Condition I.J for Whole Effluent Toxicity (WET) testing which refers to the aggregate toxic effect to aquatic organisms from all pollutants contained in a facility's effluent.

6. Draft Permit Discharge Special Condition I.A.3.e: “The effluent shall not cause visible discoloration of the receiving waters,” was removed in the Final version. This condition is duplicative of Final Permit Discharge Special Condition I.A.3.e (discharge shall not cause violation of VWQS).

7. Final Permit Condition I.A.3.n (monthly average flow calculation) was added.

8. Condition I.A.1.3.i language was revised to specify the 8-hour sampling in the permit is the minimum composite frequency and 24 hours is the maximum.

9. Conditions I.B.n was updated to say: "(See required Total Phosphorus monitoring report form WR-43-TP to report monthly totals)"

10. Condition I.G.2. was updated to say: "Total Phosphorus shall be reported monthly, via electronic Discharge Monitoring Report and on the WR-43-TP, in the following ways:"

11. Condition I.G.3.c was updated to say: "The Permittee shall annually submit a report to the Secretary as an attachment to the monthly electronic Discharge Monitoring Reporting (DMR) form and the WR-43-TP form that documents."

12. Condition I.C.1 for Annual Constituent Monitoring list of constituents was revised to exclude tests for constituents listed in Condition I.A.1. Additionally, sub-condition 3 in the draft permit was removed because this facility does use chlorination methods, making this condition not applicable. The Permit now correctly states annual reports are due by January 15th to support the deadlines within the compliance schedule table.

13. Condition I.E requires that the plan show either an alternative power supply or sufficient storage capacity. Either of these techniques used at the facility must ensure the facility and its treatment components can achieve permit compliance during a power failure event. The operation of back-up or auxiliary systems is only required as necessary to comply with permit conditions (see Condition II.B.1.a), the Emergency Power Failure Plan was revised to reference that aspect of Condition II.B.1. a. The third paragraph in Condition I.E, was revised to specify "Any back up or auxiliary systems..." to support the potential use of multiple sources of alternative power supply or back-up auxiliary systems.

14. An inconsistency was detected and was revised in the Final Permit to specify the minimum level for Total Residual Chlorine (TRC) is equal to the daily maximum effluent limit, 0.9 mg/L, not the 0.05 mg/L method detection limit for TRC. The "minimum level" definition was added to the Condition III in the Final Permit. Part V.B.3 of the Final Fact Sheet was updated to reflect the changes described.

15. Condition I.A.3.f was revised to list the correct NODI Code "9" for "conditional monitoring" and now specifies its use is for when chlorine is not required to be added to the system.

16. Condition I.J.5 for WET Testing Title 3 language was revised and now includes sub-conditions a-c.

17. The Mixing Zone language was removed from the Fact Sheet as it does not apply to this facility.

Please send any questions to Jamie Bates via email to Jamie.Bates@vermont.gov or by phone to (802)-490-6183.

Sincerely,

Jamie Bates
Direct Discharge Analyst (she/her)
Vermont Department of Environmental Conservation
Watershed Management Division, Wastewater Management Program

AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
ONE NATIONAL LIFE DRIVE, DAVIS BUILDING, 3rd FLOOR
MONTPELIER, VT 05620-3522

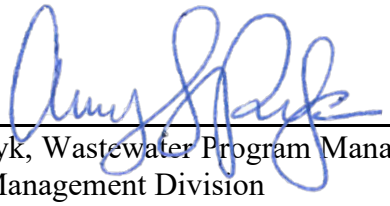
Permit Number:	**3-1248**
PIN:	**EJ92-0006**
NPDES Number:	**VT0100510**

Facility Name:	**Winooski WWTF**
Facility Address:	**250 West Allen St Winooski, VT 05404**
Coordinates:	Lat: **44.4905** Long: **-73.1974**
Facility Classification:	**3 Domestic Major**
Expiration Date:	**June 30, 2026**
Reapplication Date:	**December 31, 2025**

In compliance with the provisions of the Vermont Water Pollution Control Act as amended (10 V.S.A., Chapter 47), the Vermont Water Pollution Control Permit Regulations as amended (Environmental Protection Rules, Chapter 13), and the federal Clean Water Act as amended (33 U.S.C. § 1251 *et seq*.), and implementingfederal regulations, the City of Winooski (hereinafter referred to as the "Permittee") is authorized by the Secretary of the Agency of Natural Resources (hereinafter referred to as the "Secretary") to discharge from theWinooski Wastewater Treatment Facility (hereinafter referred to as the "WWTF") to the, Winooski River, in accordance with the following conditions.

This permit shall be effective on **8/1/2021**.

Peter Walke, Commissioner
Department of Environmental Conservation

By:  Date 7/21/2021

Amy Polaczyk, Wastewater Program Manager
Watershed Management Division

I. PERMIT SPECIAL CONDITIONS
A. EFFLUENT LIMITS AND MONITORING REQUIREMENTS

1. **Discharge Point S/N 001, Lat. 44.48978, Long. -73.19892:** During the term of this permit, the Permittee isauthorized to discharge from outfall S/N 001 of the Winooski WWTF to the Winooski River, an effluent for which the characteristics shall not exceed the values listed below:

Discharge Monitoring						
Constituent; Sampling Point and Sample Type	**Season and Sampling Frequency**	**Quantity**	**Quantity**	**Conc.**	**Conc.**	**Conc.**
Flow; Effluent; Continuous	**Year Round Daily**	**Monitor mgd Monthly Avg**				
BOD, 5-Day; Effluent; 8 Hour Comp	**Year Round Weekly**	**300 lbs/day Monthly Avg**	**450 lbs/day Weekly Avg**	**30 mg/l Monthly Avg**	**45 mg/l Weekly Avg**	**50 mg/l Daily Max**
BOD, 5-Day; Influent; 8 Hour Comp	**Year Round Weekly**			**Monitor mg/l Monthly Avg**		
Chlorine, Total Residual; Effluent; Grab	**Year Round Daily Beginning 12/1/2024**			**0.5 mg/l Monthly Avg**		**0.9 mg/l Daily Max**
Chlorine, Total Residual; Effluent; Grab	**Year Round Daily Ending 11/31/2024**				**0.86 mg/l Weekly Avg**	**1.48 mg/l Instant Max**
Copper, Total; Influent; 8 Hour Comp	**01/01 - 03/31 Quarterly**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**
Copper, Total; Influent; 8 Hour Comp	**04/01 - 06/30 Quarterly**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**
Copper, Total; Influent; 8 Hour Comp	**07/01 - 09/30 Quarterly**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**
Copper, Total; Influent; 8 Hour Comp	**10/01 - 12/31 Quarterly**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**

Discharge Monitoring Continued						
Constituent; Sampling Point and Sample Type	**Season and Sampling Frequency**	**Quantity**	**Quantity**	**Conc.**	**Conc.**	**Conc.**
Copper, Total; Effluent; 8 Hour Comp	**Year Round Monthly**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**
E. Coli; Effluent; Grab	**Year Round Weekly**					**77 #/100ml Instant Max**
Nitrite Plus Nitrate Total; Effluent; 8 Hour Comp	**06/01 - 10/31 Weekly**	**Monitor lbs/day Monthly Avg**	**Monitor lbs/day Daily Max**	**Monitor mg/l Monthly Avg**		**Monitor mg/l Daily Max**
Nitrite Plus Nitrate Total; Effluent; 8 Hour Comp	**11/01 - 05/31 Monthly**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**
Nitrogen, Kjeldahl Total; Effluent; 8 Hour Comp	**11/01 - 05/31 Monthly**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**
Nitrogen, Kjeldahl Total; Effluent; 8 Hour Comp	**06/01 - 10/31 Weekly**	**Monitor lbs/day Monthly Avg**	**Monitor lbs/day Daily Max**	**Monitor mg/l Monthly Avg**		**Monitor mg/l Daily Max**
Nitrogen, Total; Effluent; Calculated	**06/01 - 10/31 Weekly**	**Monitor lbs/day Monthly Avg**	**Monitor lbs/day Daily Max**	**Monitor mg/l Monthly Avg**		**Monitor mg/l Daily Max**
Nitrogen, Total; Effluent; Calculated	**11/01 - 05/31 Monthly**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**
pH; Effluent; Grab	**Year Round Daily**			**6.5 s.u. Min**		**8.5 s.u. Max**
Phosphorus, Total; Effluent; 8 Hour Comp	**Year Round Weekly**			**0.8 mg/l Monthly Avg**		
Phosphorus, Total; Effluent; Calculated	**Year Round Monthly**	**Monitor lbs Annual Total**	**Monitor lbs Monthly Total**	**Monitor % Monthly Total**		
Settleable Solids; Effluent; Grab	**Year Round Daily**					**1 ml/l Instant Max**

Discharge Monitoring Continued						
Constituent; Sampling Point and Sample Type	**Season and Sampling Frequency**	**Quantity**	**Quantity**	**Conc.**	**Conc.**	**Conc.**
Suspended Solids,Total; Effluent; 8 Hour Comp	**Year Round Weekly**	**300 lbs/day Monthly Avg**	**450 lbs/day Weekly Avg**	**30 mg/l Monthly Avg**	**45 mg/l Weekly Avg**	**50 mg/l Daily Max**
Suspended Solids,Total; Influent; 8 Hour Comp	**Year Round Weekly**			**Monitor mg/l Monthly Avg**		
Ultimate Oxygen Demand; Effluent; Calculated	**06/01 - 10/31 Weekly**		**850 lbs/day Daily Max**			
Zinc; Effluent; 8 Hour Comp	**Year Round Monthly**		**Monitor lbs/day Daily Max**			**Monitor mg/l Daily Max**
Flow; Annual Average; Calculated	**12/01 – 12/31 Annual**	**1.4 mgd Annual Avg**				
BOD, 5-Day (%R); Percent Removal; Calculated	**Year Round Monthly**			**85 % Monthly Min**		
Phosphorus, Total Annual Avg; Calculated	**12/01 - 12/31 Annual**	**853 lbs/yr Annual Total**				
Suspended Solids, Total (%R); Percent Removal;Calculated	**Year Round Monthly**			**85 % Monthly Min**		

2. Discharge Sampling Points

a) Effluent sampling: Effluent sample collection occurs in the effluent channel, after the weir, and after chlorination.

b) Influent sampling: The Permittee shall collect influent samples prior to the mechanical fine screen withinthe headworks.

3. Discharge Special Conditions

a) If the effluent discharged for a period of 90 consecutive days exceeds 80 percent of the permitted flow limitation, the Permittee shall submit to the Secretary projected loadings and a program for maintaining satisfactory treatment levels.

b) The Permittee shall operate the facility to meet the concentration limitations or pounds limitation, whicheveris more restrictive.

c) The Permittee shall demonstrate the accuracy of the effluent flow measurement device weekly and report theresults on the monthly report forms. The acceptable limit of error is ± 10%.

d) The monthly average concentrations of Biochemical Oxygen Demand (BOD5) and Total Suspended Solids (TSS) in the effluent shall not exceed 15 percent of influent monthly average BOD5 and TSS concentrations.

e) The discharge shall be free from substances in kind or quantity that settle to form harmful benthic deposits; float as foam, debris, scum, or other visible substances; produce odor, color, taste or turbidity that is not naturally occurring and would render the surface water unsuitable for its designated uses; result in the dominance of nuisance species; or interfere with recreational activities; or which would cause a violation of theVermont Water Quality Standards.

f) For the purposes of compliance with this permit, Total Residual Chlorine (TRC) analysis must be completed using a test method in 40 C.F.R. § 136 that achieves a minimum level (ML) no greater than 0.9 mg/L.

   TRC monitoring is required whenever chlorine is added to the treatment process and shall be monitored andrecorded. If there are months when chlorine is not required to be added to the treatment system, a no data indicator (NODI) of 9 “Conditional Monitoring” shall be reported on the monthly discharge monitoring report.

g) Any action on the part of the Secretary in reviewing, commenting upon or approving plans and specificationsfor the construction of WWTFs shall not relieve the Permittee from the responsibility to achieve effluent limitations set forth in this permit and shall not constitute a waiver of, or act of estoppel against any remedy available to the Secretary, the State of Vermont or the federal government for failure to meet any requirement set forth in this permit or imposed by state or federal law.

h) Total Nitrogen (TN) shall be monitored and reported as pounds, via a CWA approved method. An examplewould be using the sum of Nitrate/Nitrite (NOx) and TKN concentrations to find TN, which would by calculated as:

Average TN (mg/L) x Total Daily Flow (MGD) x 8.34;

where, TN (mg/L) = TKN (mg/L) + NOx (mg/L);

and where, NOx (mg/L) = NO3 (mg/L) + NO2 (mg/L)

i) 8-hour composite samples in Condition I.A.1 for BOD5, Total Suspended Solids (TSS), Total Phosphorus, TKN, NOx, Total Copper, and Total Zinc shall be taken during the hours 6:00 a.m. to 6:00 p.m. unless otherwise specified. Eight hours is the minimum and 24 hours is the maximum period for the composite.

j) Settleable solids samples shall be collected between 10:00 AM and 2:00 PM or during the period of peak flow.

k) Escherichia coli (E. coli) and Total Residual Chlorine grab samples shall be collected between the hours of 6:00 a.m. to 6:00 p.m.

l) The Ultimate Oxygen Demand (UOD) limitation is only effective from June 1 through October 31 annually.UOD shall be calculated using the Total Kjeldahl Nitrogen (TKN) load by the following formula:

UOD lbs. = ((BOD lbs. x 1.43) + (TKN lbs. x 4.57))

m) Total Annual Pounds of Phosphorus discharged shall be defined as the sum of all the Total Monthly Pounds of Phosphorus discharged for the calendar year. Total Monthly Pounds of Phosphorus discharged shall be calculated as follows:

(Monthly Average Phosphorus Concentration) x (Total Monthly Flow) x 8.34

(See required Total Phosphorus monitoring report form WR-43-TP to report monthly totals)

n) Monthly average flow shall be calculated by summing the daily effluent flow for each day in thegiven month and dividing the sum by the number of days of discharge in that month.

B. WASTE MANAGEMENT ZONE

In accordance with 10 V.S.A. § 1252, this permit hereby establishes a waste management zone that extends from the outfall of the WWTF in the Winooski River downstream 1.00 mile(s).

C. ANNUAL CONSTITUENT MONITORING

1. Unless monitoring more frequently than annually, the Permittee shall monitor outfall serial number S/N 001 and submit the results, including units of measurement, as an attachment to the DMR form WR-43 for the month in which the samples were taken for the following parameters:

Ammonia (as N)

Dissolved Oxygen

Oil & Grease

Total Dissolved Solids

2. Grab samples shall be used for Temperature, Ammonia, Dissolved Oxygen, and Oil & Grease. Total Dissolved Solids shall be collected as a composite sample. Samples shall be representative of the seasonal variation in the discharge.

3. In the event this permit is administratively continued pursuant to 3 V.S.A. § 814, the Permittee shall continue annual monitoring of the above parameters on a schedule that assures samples are representative ofthe seasonal variation in the discharge and report by January 15th each year.

4. The Permittee shall sample and report according to the following table:

Due Date	Event Description
1/15/2022	The Permittee shall submit the results from Annual Constituent Monitoring completed in 2021.
1/15/2023	The Permittee shall submit the results from Annual Constituent Monitoring completed in 2022.
1/15/2024	The Permittee shall submit the results from Annual Constituent Monitoring completed in 2023.
1/15/2025	The Permittee shall submit the results from Annual Constituent Monitoring completed in 2024.
1/15/2026	The Permittee shall submit the results from Annual Constituent Monitoring completed in 2025.

D. COPPER ASSESSMENT

Effluent monitoring data indicate cumulative loading of copper (Cu) to the Lower Winooski River may approach the assimilative capacity of the section of the river downstream of the Essex 19 Dam. To address this issue, the Secretary requires municipal WWTFs discharging to this section of river to collect influent and effluent copper data using a more sensitive method to better assess the scope of the issue and to conduct an Industrial Waste Survey.

1. To assure self-reported data accurately quantifies the amount of copper discharged, effluent copper analyses shall be carried out using a method that assures a Method Detection Limit (MDL) of 0.006 mg/L or lower. This level of detection may be achieved using EPA methods 200.7 and 200.8 listed in 40 C.F.R. Part 136 which have estimated detection limits of 0.0054 mg/L and 0.004 mg/L, respectively.

2. Influent copper shall be measured on a quarterly basis to assess the Cu loading from the collection system as well as hauled wastes received. Sufficiently sensitive test methods shall be employed to assure the influent data collected are quantifiable above the MDL of the test method used.

3. The Permittee shall submit to the Secretary the Industrial Waste Survey report that, at a minimum, includes the following:

a. Background Cu concentration expected in the drinking water based on the drinking water utility reports.

b. A list of Significant Industrial Users, waste haulers, and root treatment specialists, with the potential to introduce copper to the collection system.

c. For each source include:
   i. business name, address, and primary contact details;
   ii. listing of environmental permits, if applicable;
   iii. wastewater allocations, as applicable;
   iv. description of the facility's industrial activities, including a list of: products manufactured, raw materials, and process additives used during the manufacturing process that are suspected to contribute to Cu being present in the waste stream;
   v. estimation of potential for Cu to be present in the waste stream, where: "High" is approximately > 10lbs/yr, "Moderate" is <10lbs/yr but greater than 1 lb/yr, and "Low" is < 1lb/yr.
   vi. average daily and max daily volume estimates of the process wastewater discharged;
   vii. as applicable, describe any wastewater management practices the industrial user may use, including but not limited to treatment methods and procedures, pH adjustment, pollution prevention practices, waste minimization practices, and slug/spill prevention.

4. If a new industry that may contribute significant amounts of copper connects to the system, or an existing industry proposes an expansion which has the potential to contribute copper to their discharge, the Permittee shall notify the Secretary prior to its connection as required in Condition II.D.2 of this permit.

5. The Permittee shall report according to the following table:

Due Date	Event Description
8/1/2023	The Permittee shall submit the completed Industrial Waste Survey.

E. EMERGENCY POWER FAILURE PLAN

On March 11, 2005, the Secretary approved the Emergency Power Failure Plan (EPFP) for the wastewater treatment facility and collection system. The Permittee shall revise and submit the plan within 180 days of the permit effective date.

The Permittee shall indicate in writing to the Secretary that in the event the primary source of electric powerto the WWTF fails, the Permittee shall either provide an alternative source of power for the operation of its WWTF necessary to achieve compliance with the conditions of this permit per Condition II.B.1.a. of this permit, or demonstrate that the treatment facility has the capacity to store the wastewater volume that would be generated over the duration of the longest power failure that would have affected the facility in the last five years, excluding catastrophic events.

Any back-up or auxiliary systems, whether from a generating unit located at the WWTF or purchased from an independent source of electricity, must be separate from the existing power source used to operate theWWTF. If a separate unit located at the WWTF is to be used, the Permittee shall certify in writing to the Secretary when the unit is completed and prepared to generate power.

1. The determination of treatment system storage capacity shall be submitted to the Secretary upon completion.

2. This Plan may be combined and completed in unison with the requirements of Condition I.F for the Operation, Management, and Emergency Response Plan, such that one Plan covers both Conditions I.E andI.F.

3. The Permittee shall report according to the following table:

Due Date	Event Description
1/28/2022	The Permittee shall submit the EPFP within 180 days of the permit effective date.

F. OPERATIONS MANAGEMENT EMERGENCY RESPONSE PLAN (OMERP)

On June 27, 2008, the Secretary approved the Operation, Management, and Emergency Response Plan (OMERP) for the wastewater treatment facility and collection system.

1. The Plan shall be immediately implemented upon approval by the Secretary. The Permittee shall revisethese plans upon the Secretary's request or on its own motion to reflect equipment or operational changes.This plan shall comply with the provisions of 10 V.S.A. § 1278, which require:

a) Identification of those elements of the facility, including collection systems that are determined to be proneto failure based on installation, age, design, or other relevant factors.

b) Identification of those elements of the facility identified under subdivision (a) of this subsection which, ifone or more failed, would result in a significant release of untreated or partially treated sewage to surface waters of the State.

c) The elements identified in subdivision (b) of this subsection shall be inspected in accordance with a schedule approved by the Secretary.

d) An emergency contingency plan to reduce the volume of a detected spill and to mitigate the effect of such a spill on public health and the environment.

2. This Plan may be combined and completed in unison with the requirements of Condition I.E for EmergencyPower Failure Plan, such that one Plan covers both Conditions I.E and I.F.

3. The Permittee shall sample and report according to the following table:

Due Date	Event Description
1/28/2022	The Permittee shall submit the OMERP within 180 days of the permit effective date.

G. PHOSPHORUS OPTIMIZATION PLAN

1. Wasteload Allocation for Phosphorus

This permit includes a total phosphorus (TP) water quality-based effluent limitation of consistent with the waste load allocation (WLA) for TP, established by the U.S. Environmental Protection Agency (U.S. EPA) inthe 2016 "Phosphorus TMDLs for Vermont Segments of Lake Champlain" (LC TMDL). The Secretary reserves the right to reopen and amend this permit to include an alternate TP limitation or additional monitoring requirements based on the monitoring data, the results of phosphorus optimization activities, or a reallocation of phosphorus wasteload allocations between the Permittee and another WWTF pursuant to the requirements of TMDL and Vermont's "Wasteload Allocation Process" Rule (Environmental Protection Rule,Chapter 17).

2. Total Phosphorus Calculations and Reporting

Total Phosphorus shall be reported monthly, via electronic Discharge Monitoring Report and on the WR-43-TP, in the following ways:

a) Monthly Average Phosphorus Concentration = The average concentration of phosphorus discharged this monitoring period. (sum of all daily discharges (mg/l) measured during the month divided by the number ofdaily discharges measured during the month)

b) Total Monthly Pounds Phosphorus = The total pounds of phosphorus discharged this monitoring period.((Monthly Average Phosphorus Concentration) x (Total Monthly Flows) x 8.34)

c) Running Total Annual Pounds = The 12-month running annual TP load. (Sum the Total Monthly Poundsresults for the immediately preceding 12 months)

d) Comparison (%) of Running Total Annual Pounds to Annual Permit Limitation = The percentage of theRunning Total Annual Pounds to the Annual TP Limitation. The comparison shall be calculated as:

$$\% = \text{Running Total Annual Pounds} / \text{Annual TP Permit Limit} \times 100$$

3. Phosphorus Optimization Plan

a) The Permittee shall develop or update (as appropriate) and submit to the Secretary a Phosphorus Optimization Plan (POP) to increase the WWTF's phosphorus removal efficiency by implementing optimization techniques that achieve phosphorus reductions using primarily existing facilities and equipment.The POP shall:

(i) Be developed by a qualified professional with experience in the operation and/or design of WWTFs inconsultation with the WWTF;

(ii) Evaluate alternative methods of operating the existing WWTF, including operational, process, and equipment changes designed to enhance phosphorus removal. The techniques to be evaluated may includeoperational process changes to enhance biological and/or chemical phosphorous removal, incorporation ofanoxic/anaerobic zones, septage receiving policies and procedures, and side stream management;

(iii) Determine which alternative methods of operating the existing WWTF, including operational, process, and equipment changes will be most effective at increasing phosphorus removal; and

(iv) Include a proposed implementation schedule for those methods of operating the WWTF determined to bemost effective at increasing phosphorus removal.

b) The Secretary shall review the POP. The Permittee shall commence implementation of the POP 60 days after submittal to the Secretary unless the Secretary rejects the POP prior to that date.

c) The Permittee shall annually submit a report to the Secretary as an attachment to the monthly electronic Discharge Monitoring Reporting (DMR) form and the WR-43-TP form that documents:

(i) The optimization techniques implemented under the POP during the previous year.

(ii) Whether the techniques are performing as expected.

(iii) The phosphorus discharge trends relative to the previous year.

4. Phosphorus Reduction and Elimination Plan (PERP)

a) The WWTF shall have 12 months from the permit effective date to optimize removal of TP.

b) If, after the optimization period, the WWTF's actual, TP loads reach or exceed 80% of the annual mass limit for the WWTF, based on the WWTF's 12-month running annual load calculated using the Running TotalAnnual Pounds Calculation, the Permittee shall, within 90 days of reaching or exceeding 80% of the annual mass limit for the WWTF, develop and submit to the Secretary a projection based on the WWTF's current operations and expected future loadings of whether it will exceed its annual mass limit during the permit term.

c) If the WWTF is not projected to exceed its annual mass limit within the permit term, the WWTF shall reassess when it is projected to reach its annual mass limit prior to permit renewal and submit that informationwith its next permit application.

d) If the WWTF is projected to exceed its annual mass limit during the permit term, the Permittee shall submita Phosphorus Elimination/Reduction Plan (PERP) within 6 months from the date of submittal of the projectionsubmitted under Part 2 of this Section. The PERP shall be submitted to the Secretary to ensure the WWTF continues to comply with its annual mass limit.

e) The PERP shall be treated as an application to amend the permit, and therefore, shall be subject to all publicnotice, hearing, and comment provisions, in place at the time the plan is submitted, that are applicable to permit amendments. The Permittee shall revise the PERP, if required by the Secretary.

f) The PERP shall be developed by qualified professionals in consultation with the WWTF operator. ThePERP shall include:

(i) An evaluation of alternatives to ensure the WWTF's compliance with its annual mass limit;

(ii) An identification of the chosen alternative or alternatives to ensure the WWTF's compliance with itsannual mass limit;

(iii) A proposed schedule, including an engineer approved design and construction schedule and, if the chosenalternative or alternatives require a pilot study, a schedule for testing, that shall ensure the WWTF's compliance with its annual mass limit as soon as possible; and

(iv) A financing plan that estimates the costs for implementing the PERP and describes a strategy for financing the project.

5. The Permittee shall report according to the following table:

Due Date	Event Description
9/30/2022	The Permittee shall submit a POP and implement optimization techniques to achieve reductionsin TP.
11/29/2022	The Permittee shall commence implementation of the POP 60 days after submitting to theSecretary.
1/31/2023	The Permittee shall submit an annual report that documents TP trends and optimization techniques employed in 2022.
1/31/2024	The Permittee shall submit an annual report that documents TP trends and optimization techniques employed in 2023.
1/31/2025	The Permittee shall submit an annual report that documents TP trends and optimization techniques employed in 2024.
1/31/2026	The Permittee shall submit an annual report that documents TP trends and optimization techniques employed in 2025.

H. POLLUTANT SCAN (GREATER THAN 1 MGD)

1. The Permittee shall conduct an effluent analysis of outfall serial number S/N 001 for the pollutants includedin Appendix J, Table 2 of 40 CFR Part 122 (see Attachment A) and submit the results to the Secretary.

2. When WET testing is required by this permit sampling for both the WET test and the Pollutant Scan shall coincide.

3. In the event this permit is administratively continued pursuant to 3 V.S.A. § 814, the Permittee shall includethe results of this effluent analysis with each WET test conducted.

4. The Permittee shall sample and report according to the following table:

Due Date	Event Description
6/30/2022	The Permittee shall submit results of the January/February Toxic Pollutants Scan.
12/31/2023	The Permittee shall submit results of the August-October Toxic Pollutants Scan.
6/30/2024	The Permittee shall submit results of the January/February Toxic Pollutants Scan.

I. QUALITY ASSURANCE REPORT / PROFICIENCY TESTING

1. In accordance with 10 V.S.A. § 1263.d.2, the Secretary may require a laboratory quality assurance sample program to ensure qualification of laboratory analysts. For purposes of demonstrating compliance with the requirements of this permit regarding adequate laboratory controls and appropriate quality assurance procedures, the Permittee shall conduct and pass an annual laboratory proficiency test, via an accredited laboratory, for the analysis of all pollutant parameters performed within their facility laboratory and reported as required by this permit. This can be carried out as part of an EPA DMR-QA study.

2. In the event this permit is administratively continued pursuant to 3 V.S.A. § 814, the Permittee shall continue to complete annual proficiency tests and report by December 31 each year.

3. The Permittee shall report on quality assurance according to the following table:

Due Date	Event Description
12/31/2021	The Permittee shall submit a passing Laboratory Proficiency Test annually.
12/31/2022	The Permittee shall submit a passing Laboratory Proficiency Test annually.
12/31/2023	The Permittee shall submit a passing Laboratory Proficiency Test annually.
12/31/2024	The Permittee shall submit a passing Laboratory Proficiency Test annually.
12/31/2025	The Permittee shall submit a passing Laboratory Proficiency Test annually.

J. WHOLE EFFLUENT TOXICITY (WET) TESTING ACUTE/CHRONIC

1. The Permittee shall conduct two-species (Pimephales promelas and Ceriodaphnia dubia) modified acute/chronic WET tests (48-hour acute endpoints within a 7-day chronic test) on a composite effluent sample collected from outfall serial number S/N 001. Total Ammonia shall be measured in the highest concentration of test solution at the beginning of the test. If chlorine is used in the WWTF's system, Total Residual Chlorine shall be measured in the highest concentration of test solution at the beginning of the test.

2. The WET tests shall be conducted according to the procedures and guidelines specified in "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" and "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (both documents U.S. EPA October 2002 or, if a newer edition is available, the most recent edition).

3. Based upon the results of these tests or any other toxicity tests conducted, the Secretary reserves the right to reopen and amend this permit to require additional WET testing or a Toxicity Reduction Evaluation.

4. Permittees may request the use of lab water for controls and dilution if:

   a) acquiring receiving water is hazardous due to weather or topography

   b) previous WET tests have shown that receiving water has and poor performance in the lab controls ordilution

   c) requested by permittee and approved by the Secretary

5. In the event this permit is administratively continued pursuant to 3 V.S.A. § 814, the Permittee shall maintain the WET testing frequency established in subsection 6 during such continuance if any of the following apply:

   a) this permit contains a WET limit;

   b) the permitted facility is classified as a major NPDES discharge; or

   c) WET tests conducted during the permit term indicated any acute or chronic toxicity.

6. The Permittee shall sample and report according to the following table:

Due Date	Event Description
6/30/2022	The Permittee shall submit results of the January/February WET Test.
12/31/2023	The Permittee shall submit results of the August - October WET Test.
6/30/2024	The Permittee shall submit results of the January/February WET Test.
12/31/2025	The Permittee shall submit results of the August - October WET Test.

K. ENGINEERING EVALUATION AND REPORT / ASSET MANAGEMENT PLAN

1. The Permittee shall conduct an in-depth engineering inspection/evaluation of the wastewater treatment facility and shall submit a written report of the results to the Secretary. The evaluation can be combined with, or part of an Asset Management Plan provided the Plan includes an inspection of the treatment facility and collection system that have not been upgraded since the last permit effective date. The engineering inspection and report shall be conducted and prepared in accordance with the following conditions:

   a) A professional engineer with experience in the design of municipal wastewater treatment facilities shall be hired to perform an in-depth inspection of the wastewater treatment facility, pump stations, collection system,and manholes. At the treatment facility, all components which are critical to the treatment process, or which could adversely affect effluent quality in the event of their failure shall be evaluated. In the pump stations, all components critical to the proper conveyance of sewage, the prevention of sewage bypass, and the supportingappurtenances shall be evaluated.

   b) The inspection is to be comprised of visual observation of equipment operability and condition as well as a review of maintenance records to determine recurring equipment problems and to estimate future life. Calibration checks shall be performed on all flow meters.

   c) The resulting written inspection report shall document the components inspected, their condition, and include recommendations for all currently needed repairs and replacements and the need for on-site spare parts. The projected date of replacement or major rehabilitation of each component and the anticipated cost shall be estimated. The Permittee shall determine how the future anticipated costs will be met and advise the Secretary in a letter transmitted with the written inspection report.

   d) Should the Secretary determine that certain critical components are in need of repair or replacement due to the results of the inspection report, this permit may be reopened and amended to include an implementation schedule for repair or replacement of those components.

2. The Permittee shall report according to the following table:

Due Date	Event Description
2/1/2023	The Permittee shall report the engineering evaluation 18 months from the permit effective date.

II. GENERAL CONDITIONS

A. GENERAL REQUIREMENTS

1. Authority

This permit is issued under authority of 10 V.S.A. §§ 1258 and 1259 of the Vermont Water Pollution Control Act, the Vermont Water Pollution Control Permit Regulation (Environmental Protection Rule, Chapter 13), and § 402 of the Clean Water Act, as amended.

2. Operating Fees

This discharge is subject to operating fees as required by 3 V.S.A. § 2822.

3. Duty to Comply

The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation andreissuance, or modification; or denial of a permit renewal application. Except as provided in Bypass (Condition II.B.5) and "Emergency Pollution Permits" (Condition II.B.8), nothing in this permit shall be construed to relieve the Permittee from civil or criminal penalties for noncompliance.

4. Civil and Criminal Liability

Civil and criminal penalties for non-compliance are provided for in 40 C.F.R. § 122.41(a)(2)-(3) and 10 V.S.A.Chapters 47, 201, and 211. As of the effective date of this permit, the Vermont statutory penalties, which are subject to change, are as follows:

a. Pursuant to 10 V.S.A. Chapter 47, a civil penalty not to exceed $10,000.00 a day for each day of violation.

b. Pursuant to 10 V.S.A. Chapter 47, a fine not to exceed $25,000.00 or imprisonment for not more than sixmonths, or both.

c. Pursuant to 10 V.S.A. Chapter 47, any person who knowingly makes any false statement, representation or certification in any application, record, report, plan, or other document filed or required to be maintained by thispermit, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained by this permit, shall upon conviction, be punished by a fine of not more than $10,000.00 or by imprisonment for not more than six months, or by both.

d. Pursuant to 10 V.S.A. Chapter 201, a penalty of not more than $42,500.00 for each determination of a separate violation. In addition, if the Secretary determines that a violation is continuing, the Secretary may assess a penalty of not more than $17,000.00 for each day the violation continues. The maximum amount ofpenalty assessed under this provision shall not exceed $170,000.00.

e. Pursuant to 10 V.S.A. Chapter 211, a civil penalty of not more than $85,000.00 for each violation. In addition, in the case of a continuing violation, a penalty of not more than $42,500.00 may be imposed for eachday the violation continues.

5. Reopener Clause

In accordance with 40 C.F.R. § 122.44(c), this permit may be reopened and modified during the life of the permit to incorporate any applicable standard for sewage sludge use or disposal promulgated under section 405(d) of the Clean Water Act. The Secretary may promptly modify or revoke and reissue this permit if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal inthe permit, or controls a pollutant or practice not limited in the permit.

6. Permit Modification, Suspension, and Revocation

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or inpart during its term for cause including the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

c. Reallocation of WLA under the LC TMDL;

d. Development of an integrated WWTF and stormwater runoff NPDES permit; or

e. A change in any condition that requires either a temporary or permanent reduction or elimination of thepermitted discharge.

f. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination,or a notification of planned changes or anticipated noncompliance shall not stay any permit condition.

7. Toxic Effluent Standards

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under § 307(a) of the Clean Water Act for a toxic pollutant which is present in the Permittee's discharge and such standard or prohibition is more stringent than any limitation uponsuch pollutant in this permit, then this permit shall be modified or revoked and reissued, pursuant to Condition II.A.6 of this permit, in accordance with the toxic effluent standard or prohibition and the Permittee so notified.

8. Other Materials

Other materials ordinarily produced or used in the operation of this facility, which have been specifically identified in the application, may be discharged at the maximum frequency and maximum level identified in theapplication, provided:

a. They are not:

(i) Designated as toxic or hazardous under provisions of Sections 307 and 311, respectively, of the Clean WaterAct, or

(ii) Known to be hazardous or toxic by the Permittee, except that such materials indicated in (i) and (ii) abovemay be discharged in certain limited amounts with the written approval of, and under special conditions established by, the Secretary or their designated representative, if the substances will not pose any imminent hazard to the public health or safety;

b. The discharge of such materials will not violate the Vermont Water Quality Standards; and

c. The Permittee is not notified by the Secretary to eliminate or reduce the quantity of such materials enteringthe water.

9. Removed Substances

Collected screenings, sludges, and other solids removed in the course of treatment and control of wastewaters shall be stored, treated, and disposed of in accordance with 10 V.S.A. Chapter 159 and with the terms and conditions of any certification, interim or final, transitional operation authorization, or order issued pursuant to10 V.S.A. Chapter 159 that is in effect on the effective date of this permit or is issued during the term of this permit.

10. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of anyprovision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

11. Duty to Provide Information

The Permittee shall provide to the Secretary, within a reasonable time, any information which the Secretary mayrequest to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or todetermine compliance with this permit. The Permittee shall also furnish to the Secretary upon request, copies ofrecords required to be kept by this permit.

12. Other Information

If the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submittedincorrect information in a permit application or in any report to the Secretary, it shall promptly submit such facts or information.

13. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of legal action or relieve the Permittee fromany responsibilities, liabilities, or penalties to which the Permittee is or may be subject under 10 V.S.A. § 1281.

14. Confidentiality

Pursuant to 10 V.S.A. § 1259(b):

Any records or information obtained under this permit program that constitutes trade secrets under 1 V.S.A. §317(c)(9) shall be kept confidential, except that such records or information may be disclosed to authorized representatives of the State and the United States when relevant to any proceedings under 10 V.S.A. Chapter 47.

Claims for confidentiality for the following information will be denied:

a. The name and address of any permit applicant or Permittee.

b. Permit applications, permits, and effluent data.

c. Information required by application forms, including information submitted on the forms themselves and anyattachments used to supply information required by the forms.

15. Navigable Waters

This permit does not authorize or approve the construction of any onshore or offshore physical structures orfacilities or the undertaking of any work in any navigable waters.

16. Property Rights

Issuance of this permit does not convey any property rights in either real or personal property, or any exclusiveprivileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

17. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The Permittee shall submit a new application at least 180days before the expiration date of the existing permit, unless permission for a later date has been granted by theDirector. The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

18. Other State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permitteefrom any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulationunder authority preserved by Section 510 of the Clean Water Act.

B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

All waste collection, control, treatment, and disposal facilities shall be operated in a manner consistent with thefollowing:

a. The Permittee shall at all times properly operate and maintain in good working order all facilities and systems of treatment and control (and related appurtenances) installed or used by the Permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and 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 whenthe operation is necessary to achieve compliance with the conditions of this permit.

b. The Permittee shall provide an adequate operating staff, consistent with the Operator Rule (Environmental Protection Rule, Chapter 4), which is duly qualified to carry out the operation, maintenance, and testing functions required to ensure compliance with the conditions of this permit; and

c. The operation and maintenance of the WWTF shall be performed only by a person or persons holding a validlicense to engage in the practice of pollution abatement facility operation.

2. Need to Halt or Reduce Activity not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt orreduce the activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. The Permittee shall also take all reasonable steps to minimize or prevent any adverse impact to waters of the State, the environment, or human health resulting from non-compliance with any condition specified in this permit, including accelerated or additional monitoring as necessary to determine the nature andimpact of the non-complying discharge.

4. Dry Weather Flows

Dry weather flows of untreated municipal wastewater from any sanitary or combined sewers are not authorizedby this permit and are specifically prohibited by state and federal laws and regulations. If for any reason there is a discharge to waters of the State of dry weather flows of untreated municipal wastewater from any sanitary or combined sewer, the operator of the WWTF or the operator's delegate shall comply with the notice requirements outlined in this permit.

5. Bypass

The bypass of facilities (including pump stations) is prohibited, except where authorized under the terms andconditions of an Emergency Pollution Permit issued pursuant to 10 V.S.A. § 1268.

In addition to § 1268 findings, such bypass must meet the following three conditions:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

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

c. The Permittee submitted notices as required under 40 C.F.R. § 122.41(m)(3):

(i) Anticipated bypass. If the Permittee knows in advance of the need for a bypass, it shall submit prior notice,if possible at least ten days before the date of the bypass.

(ii) Unanticipated bypass. The Permittee shall submit notice of an unanticipated bypass as required inCondition II.D.3 (24–hour notice).

6. Upset

a. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance withsuch technology-based permit effluent limitations if the requirements of Condition II.B.6.b of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset,and before an action for noncompliance, is final administrative action subject to judicial review.

b. Conditions necessary for a demonstration of upset. A Permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevantevidence that:

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

(ii) The permitted facility was at the time being properly operated; and

(iii) The Permittee submitted notice of the upset as required in condition II.D.3 (24-hour notice).

(iv) The Permittee complied with any remedial measures required under Condition II.B.3.

c. Burden of proof. In any enforcement proceeding the Permittee seeking to establish the occurrence of anupset has the burden of proof.

7. Sewer Ordinance

The Permittee shall have in effect a sewer use ordinance acceptable to the Secretary which, at a minimum,shall:

a. prohibit the introduction by any person into the Permittee’s sewerage system or WWTF of any pollutantwhich:

(i) Is a toxic pollutant in toxic amounts as defined in standards issued from time to time under § 307(a) of theClean Water Act;

(ii) Creates a fire or explosion hazard in the Permittee's treatment works;

(iii) Causes corrosive structural damage to the Permittee's treatment works, including all wastes with a pHlower than 5.0;

(iv) Contains solid or viscous substances in amounts which would cause obstruction to the flow in sewers orother interference with proper operation of the Permittee's treatment works; or

(v) In the case of a major contributing industry, as defined in this permit, contains an incompatible pollutant, asdefined in this permit, in an amount or concentration in excess of that allowed under standards or guidelines issued from time to time pursuant to Sections 304, 306, and/or 307 of the Clean Water Act.

b. Require 45 days prior notification to the Permittee by any person or persons of a:

(i) Proposed substantial change in volume or character of pollutants over that being discharged into thePermittee's treatment works at the time of issuance of this permit;

(ii) Proposed new discharge into the Permittee's treatment works of pollutants from any source which would bea new source as defined in § 306 of the Clean Water Act if such source were discharging pollutants; or

(iii) Proposed new discharge into the Permittee's treatment works of pollutants from any source which wouldbe subject to § 301 of the Clean Water Act if it were discharging such pollutants.

c. Require any industry discharging into the Permittee's treatment works to perform such monitoring of its discharge as the Permittee may reasonably require, including the installation, use, and maintenance of monitoring equipment and monitoring methods, keeping records of the results of such monitoring, and reporting the results of such monitoring to the Permittee. Such records shall be made available by the Permittee to the Secretary upon request.

d. Authorize the Permittee's authorized representatives to enter into, upon, or through the premises of any industry discharging into the Permittee's treatment works to have access to and copy any records, to inspect any monitoring equipment or method required by this permit, and to sample any discharge into the Permittee'streatment works.

8. Emergency Pollution Permits

a. Maintenance activities, or emergencies resulting from equipment failure or malfunction, including power outages, which result in an effluent which exceeds the effluent limitations specified herein, shall be considereda violation of the conditions of this permit, unless the Permittee's discharge is covered under an emergency pollution permit under the provisions of 10 V.S.A. § 1268. The Permittee shall notify the Secretary of the emergency situation by the next working day, unless notice is required sooner under Condition II.D.2.

10 V.S.A. § 1268 reads as follows:

When a discharge permit holder finds that pollution abatement facilities require repairs, replacement, or other corrective action in order for them to continue to meet standards specified in the permit, the holder may apply in the manner specified by the Secretary for an emergency pollution permit for a term sufficient to effect repairs, replacements or other corrective action. The Secretary shall proceed in accordance with Chapter 170 ofthis title. No emergency pollution permit shall be issued unless the applicant certifies and the Secretary finds that:

(i) there is no present, reasonable alternative means of disposing of the waste other than by discharging it intothe waters of the State during the limited period of time of the emergency;

(ii) the denial of an emergency pollution permit would work an extreme hardship upon the applicant;

(iii) the granting of an emergency pollution permit will result in some public benefit;

(iv) the discharge will not be unreasonably harmful to the quality of the receiving waters; and

(v) the cause or reason for the emergency is not due to willful or intended acts or omissions of the applicant.

b. Application shall be made to the Secretary at the following address: Agency of Natural Resources, Department of Environmental Conservation, One National Life Drive, Davis 3, Montpelier VT 05620-3522.

C. MONITORING REQUIREMENTS

1. Monitoring and Records

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitoredactivity.

b. Except for records of monitoring information required by this permit related to the Permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least 5 years (or longer as requiredby 40 C.F.R. § 503), the Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period shall be extended during the course of unresolved litigation and may be extended by request of the Secretary at any time.

c. Records of monitoring information shall include:

(i) The date, exact place, and time of sampling or measurements;

(ii) The individual(s) who performed the sampling or measurements;

(iii) The date(s) analyses were performed;

(iv) The individual(s) who performed the analyses;

(v) The analytical techniques or methods used; and

(vi) The results of such analyses.

(vii) The records of monitoring activities and results, including all instrumentation and calibration andmaintenance records;

(viii) The original calculation and data bench sheets of the operator who performed analysis of the influent oreffluent pursuant to requirements of this permit; and

(ix) For analyses performed by contract laboratories:

(a) The detection level reported by the laboratory for each sample; and
(b) The laboratory analytical report including documentation of the QA/QC and analytical procedures.

(x) When "non-detects" are recorded, the method detection limit shall be reported and used in calculating anytime-period averaging for reporting on DMRs.

d. Monitoring must be conducted according to test procedures approved under 40 C.F.R. § 136 unless anothermethod is required under 40 C.F.R. Subchapters N or O.

2. Quality Control

a. The Permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at regular intervals to ensure accuracy of measurements, or shall ensure that both activities willbe conducted.

b. The Permittee shall keep records of these activities and shall provide such records upon request of theSecretary.

3. Right of Entry

The Permittee shall allow the Secretary, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as maybe required by law, to:

a. To enter upon the Permittee's premises where a regulated facility or activity is located or conducted, orwhere records must be kept under the conditions of this permit;

b. To have access to and copy, at reasonable times, any records required to be kept under the terms andconditions of this permit;

c. To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment),practices, or operations regulated or required under this permit; and

d. To sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwiseauthorized by the Clean Water Act, any substances or parameters at any location.

D. REPORTING REQUIREMENTS

1. Facility Modification / Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The dischargeof any pollutant more frequently than, or at a level in excess of, that identified and authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such a violation may result in the imposition of civil and/or criminal penalties pursuant to 10 V.S.A. Chapters 47, 201, and/or 211. Any anticipated facility alterations or expansions or process modifications which will result in new, different, or increased discharges of any pollutants must be reported by submission of a new permit application or, if such changes will not violate the effluent limitations specified in this permit, by advance notice to the Secretary of such changes. This notification applies to pollutants which are subject neither to effluent limitations in this permit, nor to notification requirements for toxic pollutants under 40 C.F.R. § 122.42(a)(1). Following such notice, the permit may be modified, pursuant to Condition II.A.6 of this permit, to specify and limit any pollutants not previously limited.

2. Change in Introduction of Pollutants to WWTF

a. The Permittee, within 30 days of the date on which the Permittee is notified of such discharge, shall providenotice to the Secretary of the following:

(i) Any new introduction of pollutants into the treatment works from a source which would be a new source asdefined in § 306 of the Clean Water Act if such source were discharging pollutants;

(ii) Except for such categories and classes of point sources or discharges specified by the Secretary, any new introduction of pollutants into the treatment works from a source which would be subject to § 301 of the CleanWater Act if such source were discharging pollutants; and

(iii) Any substantial change in volume or character of pollutants being introduced into the treatment works by asource introducing pollutants into such works at the time of issuance of the permit.

b. The notice shall include:

(i) The quality and quantity of the discharge to be introduced into the system, and

(ii) The anticipated impact of such change in the quality or quantity of the effluent to be discharged from theWWTF.

3. Noncompliance Notification

a. The Permittee shall give advance notice to the Secretary of any planned changes in the permitted facility oractivity which may result in noncompliance with permit requirements.

b. In the event the Permittee is unable to comply with any of the conditions of this permit due, among otherreasons, to:

(i) Breakdown or maintenance of waste treatment equipment (biological and physical-chemical systems including all pipes, transfer pumps, compressors, collection ponds or tanks for the segregation of treated oruntreated wastes, ion exchange columns, or carbon absorption units);

(ii) Accidents caused by human error or negligence;

(iii) Any unanticipated bypass or upset which exceeds any effluent limitation in the permit;

(iv) Violation of a maximum day discharge limitation for any of the pollutants listed by the Secretary in thispermit; or

(v) Other causes such as acts of nature,

the Permittee shall provide notice as specified in subdivisions c and d of this subsection.

c. Pursuant to 10 V.S.A. § 1295, notice for “untreated discharges,” as defined in section III.

(i) Public notice. For "untreated discharges" an operator of the WWTF or the operator's delegate shall as soonas possible, but no longer than one hour from discovery of an untreated discharge from the WWTF, post on a publicly accessible electronic network, mobile application, or other electronic media designated by the Secretary an alert informing the public of the untreated discharge and its location, except that if the operator orhis or her delegate does not have telephone or Internet service at the location where he or she is working to control or stop the untreated discharge, the operator or his or her delegate may delay posting the alert until the time that the untreated discharge is controlled or stopped, provided that the alert shall be posted no later than four hours from discovery of the untreated discharge.

(ii) Secretary notification. For "untreated discharges" an operator of the WWTF shall within 12 hours from discovery of an untreated discharge from the WWTF notify the Secretary and the local health officer of the municipality where the facility is located of the untreated discharge. The operator shall notify the Secretary through use of the Department of Environmental Conservation's online event reporting system. If, for any reason, the online event reporting system is not operable, the operator shall notify the Secretary via telephoneor e-mail. The notification shall include:

(a) The specific location of each untreated discharge, including the body of water affected. For combinedsewer overflows, the specific location of each untreated discharge means each outfall that has discharges during the wet weather storm event.

(b) Except for discharges from the WWTF to a separate storm sewer system, the date and approximate time theuntreated discharge began.

(c) The date and approximate time the untreated discharge ended. If the untreated discharge is still ongoing atthe time of reporting, the entity reporting the untreated discharge shall amend the report with the date and approximate time the untreated discharge ended within three business days of the untreated discharge ending.

(d) Except for discharges from the WWTF to a separate storm sewer system, the approximate total volume of sewage and, if applicable, stormwater that was released. If the approximate total volume is unknown at the time of reporting, the entity reporting the untreated discharge shall amend the report with the approximate totalvolume within three business days.

(e) The cause of the untreated discharge and a brief description of the noncompliance, including the type ofevent and the type of sewer structure involved.

(f) The person reporting the untreated discharge.

d. For any non-compliance not covered under Condition II.D.3.c of this permit, an operator of the WWTF orthe operator's delegate shall notify the Secretary within 24 hours of becoming aware of such condition and shall provide the Secretary with the following information, in writing, within five days of becoming aware ofsuch condition:

(i) Cause of non-compliance;

(ii) A description of the non-complying discharge including its impact upon the receiving water;

(iii) Anticipated time the condition of non-compliance is expected to continue or, if such condition has beencorrected, the duration of the period of non-compliance;

(iv) Steps taken by the Permittee to reduce and eliminate the non-complying discharge; and

(v) Steps to be taken by the Permittee to prevent recurrence of the condition of non-compliance.

e. For noncompliance events related to combined sewer overflows, sanitary sewer overflows, or bypass events,these reports must include the data described above (with the exception of time of discovery) as well as the type of event (combined sewer overflows, sanitary sewer overflows, or bypass events), type of sewer overflowstructure (e.g., manhole, combined sewer overflow outfall), discharge volumes untreated by the treatment works treating domestic sewage, types of human health and environmental impacts of the sewer overflow event, and whether the noncompliance was related to wet weather.

4. Planned Changes

a. The Permittee shall give notice to the Secretary as soon as possible of any planned physical alterations oradditions to the permitted facility. Notice is required only when:

(i) The alteration or addition to a permitted facility may meet one of the criteria for determining whether afacility is a new source in 40 C.F.R. § 122.29(b); or

(ii) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit,nor to notification requirements at 40 C.F.R. § 122.42(a)(1).

(iii) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices,and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during thepermit application process or not reported pursuant to an approved land application plan.

5. Transfer of Ownership or Control

This permit is not transferable without prior written approval of the Secretary. All application and operating fees must be paid in full prior to transfer of this permit. In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the Permittee shall provide a copy of this permit to thesucceeding owner or controller and shall send written notification of the change in ownership or control to the Secretary at least 30 days in advance of the proposed transfer date.

The notice to the Secretary shall include a written agreement between the existing and new Permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them. The Permittee shall also inform the prospective owner or operator of their responsibility to make an application for transfer of this permit.

This request for transfer application must include as a minimum:

a. A properly completed application form provided by the Secretary and the applicable processing fee.

b. A written statement from the prospective owner or operator certifying:

(i) The conditions of the operation that contribute to, or affect, the discharge will not be materially differentunder the new ownership;

(ii) The prospective owner or operator has read and is familiar with the terms of the permit and agrees tocomply with all terms and conditions of the permit; and

(iii) The prospective owner or operator has adequate funding to operate and maintain the treatment system andremain in compliance with the terms and conditions of the permit.

c. The date of the sale or transfer.

The Secretary may require additional information dependent upon the current status of the facility operation,maintenance, and permit compliance.

6. Monthly Reporting

a. The Permittee is required to submit monthly reports of monitoring results and operational parameters on Discharge Monitoring Report (DMR) form WR-43 or through an electronic reporting system made availableby the Secretary. Reports are due on the 15th day of each month, beginning with the month following the effective date of this permit.

b. Unless waived by the Secretary, the Permittee shall electronically submit its DMRs via Vermont's on-line electronic reporting system. The Permittee shall electronically submit additional compliance monitoring data and reports specified by the Secretary. When the Permittee submits DMRs using an electronic system designated by the Secretary, which requires attachment of scanned DMRs in PDF format, it is not required to submit hard copies of DMRs. The electronic submittals are submitted through the State of Vermont Agency ofNatural Resources' Online Services Portal, or its replacement.

c. If, in any reporting period, there has been no discharge, the Permittee must submit that information by thereport due date.

7. Signature Requirements

a. All reports shall be signed:

(i) For a corporation. By a responsible corporate officer or a duly authorized representative of that person. For the purpose of this section, a responsible corporate officer means: (1) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (2) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measuresto assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

(ii) For a partnership or sole proprietorship. By a general partner or the proprietor, respectively; or

(iii) For a municipality, state, or other public agency. By either a principal executive officer or ranking electedofficial, or a duly authorized representative of that person.

b. For the purposes of subdivision (d) of this subsection, a person is a duly authorized representative only if:

(i) The authorization is made in writing by a person described in subdivision (d) of this subsection;

(ii) The authorization specifies either an individual or a position having responsibility for the overall operationof the regulated facility or activity, or an individual or position having overall responsibility for environmentalmatters for the company; and

(iii) The written authorization is submitted to the Secretary.

c. Changes to authorization. If an authorization under subdivision (e) of this subsection is no longer accuratebecause a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of subdivision (e) of this subsection must be submitted to the Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.

d. Certification. Any person signing a document under subdivisions (d) or (e) of this subsection shall make thefollowing certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of myknowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

8. Additional Monitoring

If the Permittee monitors any pollutant at the location(s) designated herein more frequently than required bythis permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the DMR form WR-43. Such increased frequency shall also be indicated.

III. DEFINITIONS

For purposes of this permit, the following definitions shall apply.

Agency – means the Vermont Agency of Natural Resources.

Annual Average – means the highest allowable average of daily discharges calculated as the sum of all dailydischarges (mg/L, lbs or gallons) measured during a calendar year divided by the number of daily discharges measured during that year.

Average – means the arithmetic means of values taken at the frequency required for each parameter over thespecified period.

Bypass – means the intentional diversion of waste streams from any portion of the treatment facility.

The Clean Water Act – means the federal Clean Water Act, as amended (33 U.S.C. § 1251, et seq.).

Composite Sample – means a sample consisting of a minimum of one grab sample per hour collected during a24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportionally to flow over that same time period.

Daily Discharge – means the discharge of a pollutant measured during a calendar day or any 24-hour periodthat reasonably represents the calendar day for purposes of sampling.

For pollutants with limitations expressed in pounds the daily discharge is calculated as the total pounds ofpollutants discharged over the day.

For pollutants with limitations expressed in mg/L the daily discharge is calculated as the average measurementof the pollutant over the day.

Discharge – means the placing, depositing, or emission of any wastes, directly or indirectly, into an injectionwell or into the waters of the State.

Grab Sample – means an individual sample collected in a period of less than 15 minutes.

Incompatible Substance – means any waste being discharged into the treatment works which interferes with,passes through without treatment, or is otherwise incompatible with said works or would have a substantial adverse effect on the works or on water quality. This includes all pollutants required to be regulated under theClean Water Act.

Instantaneous Maximum – means a value not to be exceeded in any grab sample.

Major Contributing Industry – means one that: (1) has a flow of 50,000 gallons or more per average workday; (2) has a flow greater than five percent of the flow carried by the municipal system receiving the waste;

(3) has in its wastes a toxic pollutant in toxic amounts as defined in standards issued under § 307(a) of theClean Water Act; or (4) has a significant impact, either singly or in combination with other contributing industries, on a treatment works or on the quality of effluent from that treatment works.

Maximum Day or **Maximum Daily Discharge Limitation** – means the highest allowable "daily discharge"(mg/L, lbs or gallons).

Mean – means the arithmetic mean.

Minimum level (ML)— the TSD Method Page 111 Section 5.7.3 of EPA-505-2-90-001, March 1991 defines this as the level at which the entire analytical system gives recognizable mass spectra and acceptable calibration points when analyzing for pollutants of concern. This level corresponds to the lowest point at which the calibration curve is determined. EPA recommends that the "compliance level" be defined in the permit as the ML. The ML is not equivalent to the method detection level, which is defined in 40 CFR Part 136 Appendix 6 as the minimum concentration of a substance that can be measured and reported with 99-percent confidence that the analyte concentration is greater than zero and is determined from the analysis of a sample in a given matrix containing the analyte. EPA is not recommending use of the method detection level because quantitation at the method detection level is not as precise as at the ML.

Monthly Average or **Average Monthly Discharge Limitation** – means the highest allowable average of daily discharges (mg/L, lbs or gallons) over a calendar month, calculated as the sum of all daily discharges (mg/L, lbs or gallons) measured during a calendar month divided by the number of daily discharges measuredduring that month.

NPDES – means the National Pollutant Discharge Elimination System.

Secretary – means the Secretary of the Agency of Natural Resources or the Secretary's duly authorizedrepresentative.

Septage – means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewagetreatment system, or a holding tank when the system is cleaned or maintained.

Significant Industrial User – means an Industrial User subject to categorical pretreatment standards under 40 CFR 403.6 and 40 CFR Chapter I, subchapter N (known as Categorical Industrial User (CIU)); or an Industrial User that discharges an average of 25,000 gallons per day (gpd) or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blowdown wastewater); contributes a process waste stream that makes up 5 percent or more of the average dry-weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority (Secretary) on the basis that the Industrial User has a reasonable potential to adversely affect the POTW's operation; or for violating any pretreatment standard or requirement.

Untreated Discharge – means (1) combined sewer overflows from a WWTF; (2) overflows from sanitary sewers and combined sewer systems that are part of a WWTF during dry weather flows, which result in a discharge to waters of the State; (3) upsets or bypasses around or within a WWTF during dry or wet weatherconditions that are due to factors unrelated to a wet weather storm event and that result in a discharge of sewage that has not been fully treated to waters of the State; and (4) discharges from a WWTF to separate storm sewer systems.

Waste – means effluent, sewage or any substance or material, liquid, gaseous, solid, or radioactive, includingheated liquids, whether or not harmful or deleterious to waters.

Waste Management Zone – means a specific reach of Class B waters designated by a permit to accept thedischarge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings. Throughout the receiving waters, water quality criteria must be achieved but increased health risksexist in a waste management zone due to the authorized discharge.

Waters – means all rivers, streams, creeks, brooks, reservoirs, ponds, lakes, springs, and all bodies of surfacewaters, artificial or natural, which are contained within, flow through, or border upon the State or any portionof it.

Weekly Average or **Average Weekly Discharge Limitation** – means the highest allowable average of daily discharges (mg/L, lbs or gallons) over a calendar week, calculated as the sum of all daily discharges (mg/L, lbsor gallons) measured during a calendar week divided by the number of daily discharges measured during that week.

Whole Effluent Toxicity (WET) – means the aggregate toxic effect of an effluent measured directly by atoxicity test.

Wastewater Treatment Facility (WWTF) – means a treatment plant, collection system, pump station, andattendant facilities permitted by the Secretary for the purpose of treating domestic, commercial, or industrialwastewater.

IV. TABLE OF PERMITTED DISCHARGE POINTS					
Discharge ID	Discharge Activity	Discharge Status	Receiving Water	Latitude	Longitude
001	Sanitary Waste Outfall	A	Winooski River	44.48978	-73.19892

ATTACHMENT A

Appendix J to Part 122 - NPDES Permit Testing Requirementsfor Publicly Owned Treatment Works (§ 122.21(J))

TABLE 1A - EFFLUENT PARAMETERS FOR ALL POTWS

Biochemical oxygen demand (BOD-5 or CBOD-5)
Fecal coliform

Design Flow RatepH

Temperature

Total suspended solids

TABLE 1 - EFFLUENT PARAMETERS FOR ALL POTWS WITH A FLOW EQUAL TO OR GREATERTHAN 0.1 MGD

Ammonia (as N)

Chlorine (total residual, TRC)

Dissolved oxygen

Nitrate/Nitrite

Kjeldahl nitrogen

Oil and grease

Phosphorus

Total dissolved solids

TABLE 2 - EFFLUENT PARAMETERS FOR SELECTED POTWS

Hardness

Metals (total recoverable), cyanide and total phenols

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper

Lead

Mercury
Nickel
Selenium
Silver
Thallium

Zinc

Cyanide

Total phenolic compounds

Volatile organic compounds

Acrolein
Acrylonitrile
Benzene
Bromoform

Carbon tetrachloride

Chlorobenzene
Chlorodibromomethane

Chloroethane

2-chloroethylvinyl ether

Chloroform
Dichlorobromomethane

1,1-dichloroethane

1,2-dichloroethane

Trans-1,2-dichloroethylene
1,1-dichloroethylene

1,2-dichloropropane

1,3-dichloropropylene
Ethylbenzene

Methyl bromide

Methyl chloride

Methylene chloride

1,1,2,2-tetrachloroethane

Tetrachloroethylene

Toluene

1,1,1-trichloroethane
1,1,2-trichloroethane
Trichloroethylene

Vinyl chloride

Acid-extractable compounds

P-chloro-m-creso

2-chlorophenol

2,4-dichlorophenol

2,4-dimethylphenol
4,6-dinitro-o-cresol
2,4-dinitrophenol

2-nitrophenol

4-nitrophenol

Pentachlorophenol

Phenol

2,4,6-trichlorophenol

Base-neutral compounds

Acenaphthene

Acenaphthylene

Anthracene

Benzidine

Benzo(a)anthracene

Benzo(a)pyrene

3,4 benzofluoranthene

Benzo(ghi)perylene

Benzo(k)fluoranthene

Bis (2-chloroethoxy) methane

Bis (2-chloroethyl) ether

Bis (2-chloroisopropyl) ether

Bis (2-ethylhexyl) phthalate

4-bromophenyl phenyl ether

Butyl benzyl phthalate

2-chloronaphthalene

4-chlorophenyl phenyl ether

Chrysene

Di-n-butyl phthalateDi-n-octyl phthalate

Dibenzo(a,h)anthracene

1,2-dichlorobenzene

1,3-dichlorobenzene

1,4-dichlorobenzene

3,3-dichlorobenzidine

Diethyl phthalate

Dimethyl phthalate

2,4-dinitrotoluene

2,6-dinitrotoluene

1,2-diphenylhydrazine

Fluoranthene

Fluorene

Hexachlorobenzene

Hexachlorobutadiene

Hexachlorocyclo-pentadiene

Hexachloroethane

Indeno(1,2,3-cd) pyrene

Isophorone

Naphthalene
Nitrobenzene
N-nitrosodi-n-propylamine
N-nitrosodimethylamine
N-nitrosodiphenylamine
Phenanthrene
Pyrene
1,2,4, -trichlorobenzene

AGENCY OF NATURAL RESOURCES
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WATERSHED MANAGEMENT DIVISION
ONE NATIONAL LIFE DRIVE, DAVIS BUILDING, 3RD FLOOR
MONTPELIER, VT 05620-3522

FACT SHEET FOR FINAL PERMIT
(July 2021)

Permit Number: **3-1248**
PIN: **EJ92-0006**
NPDES Number: **VT0100510**

Facility Name:	**Winooski**
Facility Address:	**250 West Allen St** **Winooski VT 05404**
Coordinates:	**Lat: 44.4905 Long: -73.1974**
Facility Classification:	**3 Domestic Major**
Receiving Water:	**Winooski River**

I. Facility and Proposed Action

Applicant's wastewater treatment facility ("facility" or "WWTF") is engaged in the treatment of municipal wastewater in Winooski, Vermont. A map of facility location, outfalls, and receiving water is provided in Attachment A.

On 7/7/2009, the Secretary of the Vermont Agency of Natural Resources (the "Secretary") received Applicant's renewal application for the permit to discharge into the designated receiving water. The facility's previous permit was issued on 9/9/2004.

The previous permit (the "current permit") has been administratively continued, pursuant to 3 V.S.A. § 814, as the applicant filed a complete application for permit reissuance within the prescribed time period per the Vermont Water Pollution Control Permit Regulations (VWPCPR) § 13.5(b).

At this time, the Secretary has made a tentative decision to reissue the discharge permit.

II. Statutory and Regulatory Authority

Congress enacted the Clean Water Act (CWA or Act), "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." CWA § 101(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except as authorized by specified permitting sections of the Act, one of which is § 402. CWA §§ 301(a), 402(a). Section 402 establishes one of the CWA's principal permitting programs, the National Pollutant Discharge Elimination System (NPDES). Under this section of the Act, the U.S. Environmental Protection Agency (EPA) may "issue a permit for the discharge of any pollutant, or combination of pollutants" in accordance with certain conditions. CWA § 402(a). The State of Vermont has been approved by the EPA to administer the NPDES Program in Vermont. NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. CWA § 402(a)(1) - (2).

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: "technology-based" limitations and "water quality-based" limitations. CWA §§ 301, 303, 304(b); 40 C.F.R. Parts 122, 125, 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant-reducing technology available and economically achievable for the type of facility

being permitted. CWA § 301(b). As a class, WWTFs must meet performance-based requirements based on available wastewater treatment technology. CWA § 301(b)(1)(B). The performance level for WWTFs is referred to as "secondary treatment." Secondary treatment is comprised of technology-based requirements expressed in terms of BOD5, TSS, and pH; 40 C.F.R. Part 133.

Water quality-based effluent limits, on the other hand, are designed to ensure that state water quality standards are achieved, irrespective of the technological or economic considerations that inform technology-based limits. Under the CWA, states must develop water quality standards for all water bodies within the state. CWA § 303. These standards have three parts: (1) one or more "designated uses" for each water body or water body segment in the state; (2) water quality "criteria," consisting of numerical concentration levels and/or narrative statements specifying the amounts of various pollutants that may be present in each water body without impairing the designated uses of that water body; and (3) an antidegradation provision, focused on protecting high quality waters and protecting and maintaining water quality necessary to protect existing uses. CWA § 303(c)(2)(A); 40 C.F.R. § 131.12.

A permit must include limits for any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water quality standard, including narrative water quality criteria. See 40 C.F.R. § 122.44(d)(1). An excursion occurs if the projected or actual instream concentration exceeds the applicable criterion. A NPDES permit must contain effluent limitations and conditions in order to ensure that the discharge does not cause or contribute to water quality standard violations.

Receiving stream requirements are established according to numerical and narrative standards adopted under state law for each stream classification. When using chemical-specific numeric criteria from the State's water quality standards to develop permit limits, both the acute and chronic aquatic life criteria are used and expressed in terms of maximum allowable instream pollutant concentrations. Acute aquatic life criteria are generally implemented through maximum daily limits and chronic aquatic life criteria are generally implemented through average monthly limits.

Where a state has not established a numeric water quality criterion for a specific chemical pollutant that is present in the effluent in a concentration that causes or has a reasonable potential to cause a violation of narrative water quality standards, the permitting authority must establish effluent limits in one of three ways: based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use"; on a "case- by-case basis" using CWA § 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or, in certain circumstances, based on an "indicator parameter." 40 C.F.R. § 122.44(d)(1)(vi)(A-C).

The state rules governing Vermont's NPDES permit program are found in the Vermont Water Pollution Control Permit Regulations (Environmental Protection Rule, Chapter 13).

III. Permit Limit and Condition Formulation

A. Reasonable Potential Determination

In determining whether this permit has the reasonable potential to cause or contribute to an impairment, the Secretary has considered:

1) Existing controls on point and non-point sources of pollution as evidenced by the Vermont surface water assessment database;

2) Pollutant concentration and variability in the effluent as determined from the permit application materials, monthly discharge monitoring reports (DMRs), or other facility reports;

3) Receiving water quality based on targeted water quality and biological assessments of receiving waters, as applicable, or other State or Federal water quality reports;

4) Toxicity testing results based on the Vermont Toxic Discharge Control Strategy, and compelled as a condition of prior permits;

5) Available dilution of the effluent in the receiving water, expressed as the instream waste concentration. In accordance with the applicable Vermont Water Quality Standards (Environmental Protection Rule, Chapter 29A), available dilution for rivers and streams is based on a known or estimated value of the lowest average flow which occurs for seven (7) consecutive days with a recurrence interval of once in ten (10) years (7Q10) for aquatic life and human health criteria for non-carcinogens, or at all flows for human health (carcinogens only) in the receiving water. For nutrients, available dilution for stream and river discharges is assessed using the low median monthly flow computed as the median flow of the month containing the lowest annual flow. Available dilution for lakes is based on mixing zones of no more than 200 feet in diameter, in any direction, from the effluent discharge point, including as applicable the length of a diffuser apparatus; and

6) All effluent limitations, monitoring requirements, and other conditions of the draft permit.

The Reasonable Potential Determination for this facility is attached to this Fact Sheet as Attachment A.

B. Anti-Backsliding

Section 402(o) of the CWA provides that certain effluent limitations of a renewed, reissued, or modified permit must be at least as stringent as the comparable effluent limitations in the current permit. EPA has also promulgated anti-backsliding regulations which are found at 40 C.F.R. § 122.44(l). Unless applicable anti- backsliding exemptions are met, the limits and conditions in the reissued permit must be at least as stringent as those in the current permit.

IV. Facility Information

A. Facility History

The City of Winooski WWTF provides wastewater treatment for residential and commercial and industrial properties in the City of Winooski. The original WWTF was constructed in 1970. Several upgrades were completed at the facility in the 1980's and 1990's. The latest upgrade was in 2019 resulted in a new headworks building which now includes a mechanical screen and aerated grit removal system. The secondary treatment system consists of extended air and includes two secondary clarifiers. Chlorine disinfection is used prior to discharging to the Winooski River. The facility currently is not equipped for dichlorination.

On June 16, 2004 the City submitted an application for renewal of their discharge permit. Having completed its review of the application, the Department has made a determination to renew the discharge permit for the wastewater treatment facility's discharge. Following is a discussion of the specific factors considered in the renewal of this permit.

B. Pretreaters

The following pretreaters are permitted under the NPDES program to discharge to the facility.

Pretreater	Discharge Activity
Four Quarters Brewing, LLC	Food/Beverage Processing

C. Receiving Water Classification - Winooski River

All uses Class B with a waste management zone. Class B waters are suitable for swimming and other primary contact recreation; irrigation and agricultural uses; aquatic biota and aquatic habitat; good aesthetic value; boating, fishing, and other recreational uses; and suitable for public water source with filtration and disinfection or other required treatment. A waste management zone is a specific reach of Class B(1) or B(2) waters designated by a permit to accept the discharge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings.

D. Receiving Water Description

The Winooski River downstream of the Winooski WWTF discharge is a Class B (2) water and is designated as a seasonal Warm (June 1 - September 30) and Cold (October 1 – May 31) Water Fish Habitat. At the point of discharge, the river has a contributing drainage area of 1050.0 square miles. The existing permit waste management zone (WMZ) in the Winooski River begins at the outfall of the WWTF and extends downstream approximately 1.0 mile pursuant to 10 V.S.A., Section 1252.

Hydrology:

Facility Design Flow: 1.400 MGD = 2.166 CFS

Estimated 7Q10 = 147.0 CFS

Estimated Low Median Monthly Flow (LMM) = 482.3 CFS Estimated MAF = 1257 CFS

Instream Waste Concentration at 7Q10 Flow (IWC-7Q10) = 0.015 (>1%)

Instream Waste Concentration at LMM (IWC-LMM) = 0.004 (<1%)

In addition, the Winooski River drains into Lake Champlain, which is impaired for phosphorus and is subject to a Total Maximum Daily Load (TMDL) for phosphorus. This is discussed further in Section V.C.4. of this Fact Sheet.

Streamflow in the lower portion of the Winooski River, especially below Essex 19 hydroelectric project, is influenced by artificial flow regulation. In this instance section § 29A-202 Flow Values Used to Evaluate Compliance with Applicable Numeric Criteria for Rivers, Streams, Brooks, Creeks, and Riverine Impoundments of the Vermont Water Quality Standards applies: Where there is a Minimum Flow Agreement or requirement. For waters where the natural flow regime is altered by a human-made structure and where a minimum flow agreement or requirement has been established under 10 V.S.A. § 1003 or pursuant to a Section 401 Water Quality Certification, issued pursuant to the "Vermont Water Pollution Control Permit Regulations", compliance with the applicable numeric water quality criteria shall be calculated on the basis of the 7Q10 flow value or at the agreed/required minimum flow, whichever is less, unless an alternative flow statistic is specified in § 29A-304 of these rules.

As specified in a 1995 amendment to the current Water Quality Certification for Essex No. 19 Hydropower Project, the agreed upon minimum flow below this dam is 450 cfs June 16th – March 31st (the period within 7Q10 streamflow conditions are most likely to occur). The estimated natural 7Q10 flow for the location of discharge in the Winooski River is 141 cfs, calculated by multiplying the site-specific drainage area in square miles by 0.140 cfs/sq. mi. which is the statewide average 7Q10 for all unregulated USGS streamflow gages with watershed areas greater than 50 square miles. This method is applied where no appropriate, unregulated streamflow data exist on or near the site of interest. This estimated natural 7Q10 flow value is less than the agreed upon minimum flow and thus was applied to the RPD process for this facility at this time.

It should be noted that a statewide re-analysis of streamflow statistics was conducted by VTDEC in 2019 using additional observed streamflow data collected at USGS gaging stations across the state through 2017. Previous flow statistics used for purposes of RPDs were calculated using data only through 2012. Therefore, in some instances estimates of a receiving water's population streamflow statistic, such as 7Q10 or low monthly median, will change over time due to varying sample sizes (i.e., years of record in the dataset). Estimated low- flow values for receiving waters at other discharge locations are not relevant to this determination, as specific estimated flow values will vary based on the drainage area at the point of discharge under consideration and/or the length of streamflow record(s) available at the time of assessment.

E. Waste Management Zone

A Waste Management Zone (WMZ) is a specific reach of Class B waters designated by a permit to accept the discharge of properly treated wastes that contained organisms pathogenic to human beings prior to treatment. Throughout the receiving waters, water quality criteria must be achieved but increased health risks exist in a WMZ due to the authorized discharge.

The Secretary may establish a WMZ as part of the issuance of a discharge permit as described in 10 V.S.A.

§ 1252. The model used to determine the WMZ is based upon three precepts of domestic wastewater treatment facility discharges: 1) the use of coliform bacteria as an indicator of pathogenic organisms; 2) despite proper operation and maintenance disinfection failures may occur; and 3) a reasonably sized waste management segment provides a "buffer zone" downstream of the wastewater discharge in which contact recreation is not recommended. If a disinfection failure should occur at the WWTF, the time of travel through this zone will provide time during which some pathogen die-off will occur and may also allow time for public notification. A WMZ is not a Mixing Zone.

This facility currently has a 1.00-mile WMZ.

V. Monitoring

A. Flow Monitoring at Discharge Point 001

1. Flow

The draft permit maintains the annual average flow limitation of 1.4 MGD. This facility maintains a constant discharge and continuous flow monitoring is required.

B. Conventional Pollutants Monitoring at Discharge Point 001

1. BOD, 5-Day

The effluent limitations for BOD5 remain unchanged from the current permit. The monthly and weekly averages reflect the minimum level of effluent quality specified for secondary treatment in 40 C.F.R. Part 133.102. In addition, the draft permit contains a maximum day, BOD5 limitation pursuant to Vermont Water Pollution Control Permit Regulations § 13.4.c. The Secretary implements the limitation to supplement the federal technology-based limitations. This is designed to prevent a gross one-day permit effluent violation from being offset by multiple weekly and monthly sampling events, which would enable a discharger to comply with the weekly average and monthly average permit limitations. Mass limits are calculated using the concentration limits outlined above. The BOD5 monitoring requirement is unchanged from the current permit.

2. BOD, 5-Day (% REMOVAL)

The BOD5 monthly average percent removal shall not be less than 85 percent as specified in 40 C.F.R. § 133.102(a)(iii). This limit is a Technology-Based Effluent Limitation (TBEL) established by the Clean Water Act that requires WWTFs to achieve a minimum level of effluent quality. TBELs are based on available technologies to reduce discharges of pollutants into waters of the United States and are developed independently of the potential impact of a discharge on the receiving water. This condition is unchanged from the current permit.

3. Chlorine, Total Residual

The current permit included 1.48 mg/L instantaneous maximum and 0.86 weekly average limits which are not protective of the VWQS. A new TRC limitation of 0.9 mg/L, daily maximum and 0.5 monthly average, has been included in the draft permit. Based on the Secretary's Chlorine Policy, a limit of 0.9 mg/L will ensure that the instream water quality criteria for Chlorine of 0.019 mg/L, (acute) and 0.011 mg/L (chronic) of the Vermont Water Quality Standards is met. From the permit effective date until 11/31/2024, the current permit limits shall be effective. Beginning 12/1/2024, the newly proposed limitations for TRC shall apply. Monitoring for TRC shall remain daily.

The minimum level for chlorine is dependent on the EPA approved methods found in the current version of Standard Methods for the Examination of Water and Wastewater, Method 4500 CL-E and G. The Permittee shall select one of these methods to determine Total Residual Chlorine.

Condition I.A.3.f was changed in the Final Permit to correct the minimum level for TRC is equal to the daily maximum effluent limitation 0.9 mg/L, not the 0.05 mg/L method detection limit. This change was resulting from other comments received for the Essex Junction WWTF permit renewal, that went on public notice around the same time as this Draft Permit.

The Draft Permit language was based on the U.S. Environmental Protection Agency's (EPA) 1991 TSD method guidance in Section 5.7.3 on page 111 of EPA-505-2-90-001, March 1991. The TSD method defines the Minimum Level as: "the level at which the entire analytical system gives recognizable mass spectra and acceptable calibration points when analyzing for pollutants of concern. This level corresponds to the lowest point at which the calibration curve is determined."

This TSD Method reference and "minimum level" definition was included in in the Final Permit Condition III to clarify the meaning between the minimum level, method detection limit, and compliance level. Part V.B.3 of this Fact Sheet reiterates these changes.

Chlorination and dechlorination systems should have an alarm system to indicate interruptions or malfunctions that will result in levels of chlorine that were inadequate for achieving effective disinfection or result in excessive levels of chlorine in the final effluent. If an alarm system is currently in place or is installed in the future, please send us a description of the system and how it will notify operators of problems with the disinfection system. Once installed, explanations for TRC limit violations should detail if the incident was detected by the alarm system on the monthly DMR, applicable to the month the violation was observed.

4. E. Coli

The instantaneous maximum E. coli limitation remains unchanged and is based upon the limitation in the current permit and the anti-backsliding provisions of Section 402(o) of the CWA.

5. pH

The pH limitation remains at 6.5 - 8.5 Standard Units as specified by Vermont Water Quality Standards § 29A-303(6). Monitoring remains at daily.

6. Settleable Solids

The settleable solids limitation of 1.0 mL/L instantaneous maximum and daily monitoring remain unchanged from the current permit. This numeric limit was established in support of the narrative standard in Vermont Water Quality Standards § 29A-303(2).

7. Suspended Solids, Total (% Removal)

As required in the current permit, the TSS monthly average percent removal shall not be less than 85 percent as specified by 40 C.F.R. §133.102(b)(3). This limit is a Technology-Based Effluent Limitation (TBEL) established by the Clean Water Act that requires WWTFs to achieve a minimum level of effluent quality. TBELs are based on available technologies to reduce discharges of pollutants into waters of the United States and are developed independently of the potential impact of a discharge on the receiving water.

8. Suspended Solids, Total

The effluent limitations for TSS remain unchanged from the current permit. The monthly and weekly averages reflect the minimum level of effluent quality specified for secondary treatment in 40 C.F.R. Part 133.102. In addition, the draft permit contains a maximum day TSS limitation pursuant to Vermont Water Pollution Control Permit Regulations § 13.4 c. The maximum day limitation supplements the federal technology-based limitations to prevent a gross one-day permit effluent violation from being offset by multiple weekly and monthly sampling events to achieve the weekly and monthly averages. The mass limits are calculated using the concentration limits outlined above.

9. Ultimate Oxygen Demand

On the basis of assimilative capacity modeling completed on the receiving water, an effluent UOD limit is included in the draft permit in order to ensure compliance with the dissolved oxygen water quality criteria during critical summertime instream conditions.

UOD is dependent on the quantity of Biochemical Oxygen Demand (BOD5) and Total Kjeldahl Nitrogen (TKN) in a discharge, as specified in the following equation:

$$\text{UOD (lbs/day)} = [(\text{BOD5 (lbs/day)} \times 1.43) + (\text{TKN (lbs/day)} \times 4.57)]$$

Calculation of the UOD concentration in the discharge is required weekly from the period of June 1 through October 31. The sampling frequency is unchanged from the current permit. The BOD and TKN analyses used to calculate UOD must be conducted on the same effluent sample. Since receiving waters are the most sensitive to oxygen depleting wastes during periods of high-water temperature and low flow, the UOD limitation is in effect from June 1 through October 31 of each year.

The UOD limitation ensures compliance with the dissolved oxygen criteria during this time period as specified in the Vermont Water Quality Standards. During the other months of the year, the Biological Oxygen Demand limitation is adequate to ensure compliance with the dissolved oxygen criteria.

C. Nutrients Monitoring at Discharge Point 001

1. Nitrite Plus Nitrate Total 1 Det.

Nitrite Plus Nitrate as Nitrogen (NOx) – Nitrite (NO2-) and Nitrate (NO3-) are oxidized forms of Nitrogen, also referred to as Nitrate/Nitrite or abbreviated as NOx. NOx is needed to calculate Total Nitrogen (TN). To gather data on the amount of Total Nitrogen in this discharge, Nitrite (NO2-) plus Nitrate (NO3-) monitoring is proposed in the renewed permit. The proposed monitoring is once per week for the summer (June through October) and once per month during the winter (November through May). Weekly samples shall be reported as monthly average and daily maximums for both concentration and mass quantity. Monthly samples shall be reported as daily maximum for both concentration and mass quantity.

The sum of Nitrite (NO2-) and Nitrate (NO3-) is represented as NOx to simplify the notation in wastewater chemistry. The x represents the number of Oxygen atoms (2 or 3) and the negative charge notation (-) is dropped. This notation is also used in atmospheric chemistry where other oxidation states are possible.

$$NO2- + NO3- = NOx$$

Test results are reported in terms of Nitrogen (N) because water quality standards are generally expressed in terms of Nitrogen for simplicity and consistency. This constituent (NOx) is sometimes also shown as (NO2/NO3), Nox, NOX, Nitrate/Nitrite Nitrogen, and Nitrite Plus Nitrate Total 1 Det. (As N).

As applicable, results shall be used to calculate Total Nitrogen.

2. Nitrogen, Kjeldahl Total

TKN is the sum of nitrogen in the forms of ammonia (un-ionized (NH3) and ionized (NH4+)), soluble organic nitrogen, and particulate organic nitrogen. To gather data on the amount of TKN in this discharge and its potential impact on the receiving water, a weekly “monitor only” from June 1 to October 31 and monthly "monitor only" from November 1 to May 31 sampling requirement is being proposed for the draft permit. The seasonal weekly condition previously required samples to be reported as a daily maximum value for both concentration and load. The permit requires weekly samples to be reported as monthly averages and daily maximum for both concentration and mass quantity results. The seasonal monthly sampling is a new condition in the permit and shall be reported as daily maximum for both concentration and mass quantity.

As applicable, results shall be used to calculate Total Nitrogen.

3. Nitrogen, Total

TN is the sum of nitrate, nitrite, ammonia, soluble organic nitrogen, and particulate organic nitrogen. To gather data on the amount of Total Nitrogen (TN) in this discharge and its potential impact on the receiving water, a “monitor only” requirement for TN has been included in this permit.

TN is a calculated value based on the sum of NOx and TKN, and, shall be reported as pounds, calculated as:

$$\text{Average TN (mg/L)} \times \text{Total Daily Flow} \times 8.34 \text{where, TN (mg/L)} = \text{TKN (mg/L)} + \text{NOx (mg/L)}$$

Per EPA excess nitrogen (N) and phosphorus (P) are the leading cause of water quality degradation in the United States. Historically, nutrient management focused on limiting a single nutrient—phosphorus or nitrogen—based on assumptions that production is usually phosphorus limited in freshwater and nitrogen limited in marine waters. Scientific research demonstrates this is an overly simplistic model. The evidence clearly indicates management of both phosphorus and nitrogen is necessary to protect water quality. The literature shows that aquatic flora and fauna have differing nutrient needs: some are P dependent, others N dependent and others are co-dependent on

these two nutrients.

Like P, N promotes noxious aquatic plant and algal growth. High concentrations of P and N together cause greater growth of algae than P alone. The relative abundance of these nutrients also influences the type of species within the community. Furthermore, a high N-to-P ratio may exacerbate the growth of cyanobacteria, while elevated levels of nitrogen increase toxicity in some cyanobacteria species. Given the dynamic nature of all aquatic ecosystems, for the State to fully understand the degradation to water quality it is necessary to limit P and monitor bioavailable N (including nitrate, ammonium, and certain dissolved organic nitrogen compounds).

Facilities with design flow greater than 1 MGD will complete monthly monitoring unless more frequent sampling is already required by the current permit. Facilities with design flows less than 1 MGD will complete quarterly monitoring unless more frequent sampling is already required by the current permit. Total Nitrogen monitoring is proposed at a weekly frequency from June through October and a monthly frequency from November through May for this facility. The permit requires weekly samples to be reported as monthly averages and daily maximum for both concentration and mass quantity results. The seasonal monthly sampling is a new condition in the permit and shall be reported as daily maximum for both concentration and mass quantity.

4. Phosphorus, Total

Background:

Excess phosphorus entering Lake Champlain (the Lake) from a variety of sources has impaired the Lake's water quality. The Lake Champlain Total Maximum Daily Load (LC TMDL), places a cap on the maximum amount of phosphorus from point and non-point sources that is allowed to flow into the Lake while still meeting Vermont's water quality standards. The EPA developed phosphorus TMDLs for the twelve Vermont segments of Lake Champlain in collaboration with the Vermont Agency of Natural Resources, Department of Environmental Conservation and the Vermont Agency of Agriculture, Food, and Markets, and released the document titled "Phosphorus TMDLs for Vermont Segments of Lake Champlain" (June 2016). The 2016 LC TMDL specifies allowable phosphorus loads, or waste load allocations (WLA), expressed as metric tons per year (mt/yr), for each of the 59 WWTFs that discharge to the Lake's watershed. The Secretary will issue wastewater discharge (NPDES) permits in accordance with the permit issuance schedule in the Lake Champlain TMDL Phase 1 Implementation Plan (Chapter 3, page 46). The Secretary will follow this schedule unless special circumstances are raised by the facility that warrant the issuance of the permit sooner (e.g., planned facility upgrades) and the Wastewater Management Program has sufficient staff capacity to handle the request.

Reductions in WLAs are targeted only to WWTFs in those lake segment watersheds where the currently permitted wastewater load represents a significant (defined as being 10% or greater) portion of the total phosphorus load to that segment from all sources (Main Lake, Shelburne Bay, Burlington Bay, St. Albans Bay) or where wastewater upgrades would meaningfully reduce the phosphorus reduction burden placed on non-wastewater (non-point) sources (Missisquoi Bay). Therefore, WWTFs discharging to the Port Henry, Otter Creek, Mallets Bay, Northeast Arm, Isle LaMotte, and the South Lake A/B lake segments were not assigned a new waste load allocation. The EPA also determined that wastewater facilities with a design flow of < 0.1 million gallons per day (MGD) would be given the same allocations as in the 2002 TMDLs due to their minor contribution of phosphorus loading.

The LC TMDL establishes new annual WLAs for WWTFs with a design flow capacity of above 0.1 MGD that discharge to the Main Lake, Shelburne Bay, Burlington Bay, St. Albans Bay, and Missisquoi Bay lake segments. Specifically, WWTFs with a design flow capacity of 0.1 to 0.2 MGD were assigned WLAs based on a 0.8 mg/L effluent phosphorus concentration at permitted flow while WWTFs with design capacity of >0.2 MGD were assigned WLAs based on a 0.2 mg/L effluent phosphorus concentration at permitted flow.

In the LC TMDL, EPA acknowledged and supported the Secretary's commitment to employ flexible approaches to implementing the WWTF WLAs including "providing a period of time for optimization to be pursued and the corresponding load reduction results to be realized, and then commencement of the process to upgrade phosphorus treatment facilities will be required when actual phosphorus loads reach 80% of the LC TMDL limits." The Wastewater Management Program maintains a tracking system for phosphorus loading from Vermont WWTFs

so facilities approaching or over the 80% threshold can be identified. The 80% phosphorus load threshold is calculated by comparing the individual WWTF phosphorus WLA established in the LC TMDL to the actual phosphorus discharge load from the WWTF over last 12 months:

WWTF Annual TP Load / LC TMDL WLA x 100

There are currently WWTFs in the Lake Champlain watershed with existing discharged loads of phosphorus already at, or above, 80% of allowable loads. To ensure facilities are operating as efficiently as possible, all reissued wastewater discharge (NPDES) permits under the LC TMDL will specify a period of 12 months for optimization to be pursued and the corresponding load reduction results to be realized, prior to evaluating where a facility ranks relative to the 80% trigger. Discharge permits will specify that after the optimization period, when an existing facility reaches 80% of its WLA for phosphorus (evaluated as a rolling, 12-month load), the Permittee will have to develop and submit a projection of whether the facility will exceed its WLA during the permit term and if it is projected to do so, then the facility will be required to develop a Phosphorus Elimination/Reductio n Plan (PERP) that will ensure the facility continues to comply with its WLA.

Effluent TP limits in permits are expressed as: (1) total annual mass loads, and (2) for facilities that currently have an existing monthly effluent concentration limit for TP in their NPDES permit, as monthly effluent concentration limits.

Phosphorus Limit in Draft Permit:

The current permit includes a mass-based effluent limit of 2557 lbs/year. This annual mass limitation was based on an allocation that was established in the 2002 Lake Champlain Phosphorus TMDL ("LC TMDL"). The current permit also contains an effluent TP concentration limit of 0.8 mg/L, monthly average, consistent with the annual load limit. The concentration effluent limitation is based on the requirements of 10 V.S.A. § 1266a and is unchanged from the current permit. The new, annual WLA represents a 66% reduction (-1,704 pounds) from the current permit and is equivalent to setting the effluent TP limit at 0.8 mg/L at the design capacity of the WWTF (1.40 MGD).

To convert units of the WLA from metric tons to pounds for the annual, mass-based TP permit limit, the following equation was used and the resulting WLA rounded down to the nearest pound:

0.39 mt/yr * 2204.62 lbs/mt = 853 lbs/yr

The LC TMDL includes WLAs for WWTFs expressed as total annual mass loads. Compliance with the annual limit will be calculated each month using the Running Total Annual Pounds Calculation, rather than once at the end of the calendar year. The LC TMDL does not include monthly average concentration effluent limits for WWTFs. State law (10 V.S.A. § 1266a) requires that, "No person directly discharging into the drainage basins of Lake Champlain or Lake Memphremagog shall discharge any waste that contains a phosphorus concentration in excess of 0.80 milligrams per liter on a monthly average basis. Discharges of less than 200,000 gallons per day, permitted on or before July 1, 1991, shall not be subject to the requirements of this subsection." Therefore, in addition to the annual mass load effluent limitation required by the LC TMDL, the permit must also include a monthly average concentration limit for phosphorus. While the WLA in the LC TMDL was calculated based on a TP effluent concentration of 0.80 mg/L, the permit does not include 0.80 mg/L as the concentration effluent limitation because a Permittee may not need to achieve 0.80 mg/L to ensure compliance with the WLA established in the LC TMDL. Rather the permit includes a monthly average concentration limit for phosphorus of 0.80 mg/L to ensure compliance with state law and to recognize seasonal variations in the facility's discharge. It is important to note that because the annual mass load and average monthly concentration limits are not mathematically consistent in the permit, meeting a 0.8 mg/L concentration limit at design flows will not result in meeting the annual mass limit.

The Permittee must comply with both limitations and, as required by the permit, must operate the facility to meet the more restrictive limitation, which may vary depending upon discharge flows at the facility. If the facility is operating at design flows, the annual mass load limitation will be the more restrictive limitation. However, if the facility is operating at low flows, the monthly average concentration limit may be the more restrictive limitation.

This draft permit requires the submission of monitoring reports to the Secretary specific to tracking TP in the discharge. A report that documents the annual TP discharged from the facility, summarizes phosphorus removal optimization and efficiencies, and tracks trends relative to the previous year shall be attached to the December WR-43 form. The annual and monthly TP loads discharged from the facility shall also be reported electronically with other required parameters.

Analysis in Support of Phosphorus Limit:

The Secretary is using the WLA from the LC TMDL (Available at: https://ofmpub.epa.g ov/waters10/attains_ impaired_waters.show _tmdl_document?p_tmd l_doc_blobs_id=79000) as the water quality based effluent limitation (WQBEL) for phosphorus for this permit. Because this is the first permit issued to this facility under the new LC TMDL and the TMDL is less than five years old The LC TMDL was issued June 17, 2016), an analysis of the assumptions underlying the TMDL is not required. In re Montpelier WWTF Discharge Permit, 2009 WL 4396740, 6, 9-10 (Vt. Envtl. Ct. June 30, 2009) (stating that it "probably would have been meaningless to engage in further analysis" of the 2002 Lake Champlain TMDL a mere year and a half after its adoption, while also holding that when issuing a permit more than five years after the adoption of a TMDL, ANR must assess whether the past assumptions upon which the WLA was based upon "continue to have a basis of reliability"). Notwithstanding the fact that an analysis is not required, the Agency provides the following. Using the WLA from the LC TMDL as the phosphorus WQBEL in the permit is appropriate because the State is making significant progress toward meeting the assumptions upon which the WLA is based.

First, the State has largely met the milestones in the LC TMDL Accountability Framework (For the Accountability Framework, see pages 54-59 of the LC TMDL) and is actively working to meet those that are still outstanding. For 2016, EPA gave Vermont an "excellent" report card for meeting milestones by December 30, 2016 (see below). For 2017, as outlined in the 2018 Vermont Lake Champlain Phosphorus Total Maximum Daily Loads Accountability Framework Report (http://dec.vermont. gov/sites/dec/files/ wsm/erp/docs/2018Ver montLakeChamplainPhosphorusTMDLAccountabilityFrameworkReport.pdf), the

State has completed a majority of the milestones in the LC TMDL Accountability Framework due by December 30, 2017 and is actively working to complete those that are still outstanding. While not every milestone was completed by December 30, 2017, this is not sufficient to undermine the assumption that reductions in other sectors will occur in the future. For example, while the "Developed Lands General Permit" has not yet been issued, the State is actively working to adopt the rules necessary to issue and implement this permit, and the date by which applicants must apply for coverage under the permit – October 1, 2023 – has not changed. Thus, despite a delay in issuance of this permit, it is still appropriate to assume that reductions will be achieved in this sector based upon the timeframe envisioned when the LC TMDL was issued.

Second, the EPA's assessment of the State's progress under the LC TMDL has found that the State is making satisfactory progress. EPA's "overall assessment is that Vermont has made excellent progress in achieving the milestones in the [LC TMDL] Accountability Framework" through December 30, 2016 (Letter dated February 15, 2017 from EPA Acting Regional Administrator Deborah A. Szaro to Secretary of Natural Resources Julie Moore and Secretary of Agriculture, Food and Markets Anson Tebbetts). EPA's next "report card" is expected within a couple months. If EPA finds that the State's progress is not satisfactory, EPA may, amongst other things, revise the TMDLs to reallocate additional load reductions from nonpoint to point sources (i.e. create more stringent WLAs). EPA has taken no such actions, but rather, has thus far provided positive assessment of the State's compliance with the LC TMDL Accountability Framework. Therefore, the State has nothing from EPA indicating that the assumptions upon which the WLA was developed are no longer reliable.

Since less than five years have passed since the adoption of the LC TMDL, with the State having completed or working to complete milestones, and with positive reports thus far from EPA, there is no reason to believe that the assumptions upon which the WLA was developed – including that discharges in other sectors will be reduced in the future – are no longer valid. Therefore, it is appropriate to establish the phosphorus WQBEL for this facility based upon its WLA in the LC TMDL.

D. Toxic Pollutants Monitoring at Discharge Point 001

1. Copper, Total

Influent Total Copper monitoring on a quarterly basis is proposed in the draft permit, for daily maximum mass quantity and concentration. This condition is intended to compliment Condition I.D of the draft permit where the Permittee shall conduct an Industrial Waste Survey for Total Copper within the collection system prior to treatment at the WWTF. Collection of this data will allow the Secretary to further assess the impacts of Copper on the WWTF and the Lower Winooski River.

The draft permit includes a new monthly "monitor only" condition, for daily max concentration and mass quantity of Total Copper from composite samples. This was previously a quarterly "monitor only" condition for monthly average, weekly average, and daily maximum concentrations of Total Copper. Monthly DMRs typically reported results from a single sample collected within a quarter, such that the values reported for daily maximum, weekly average, and monthly average were the same. For this reason, the monthly and weekly average monitoring requirements were removed from the draft permit.

Copper data collected the over the next permit term will be used to further assess the impacts of the facility's discharge of Copper to the Lower Winooski River, for the next permit renewal.

As stated in Condition I.D of the draft permit: copper analyses shall be carried out using a method that assures a Method Detection Limit (MDL) of 0.006 mg/L or lower. This level of detection may be achieved using EPA methods 200.7 and 200.8 listed in 40 C.F.R. Part 136 which have estimated detection limits of 0.0054 mg/L and 0.004 mg/L, respectively.

2. Zinc

The draft permit includes a new monthly "monitor only" condition, for daily max concentration and mass quantity of Total Zinc from composite samples. This was previously a quarterly "monitor only" condition for monthly average, weekly average, and daily maximum concentrations of Total Zinc. Monthly DMRs typically reported results from a single sample collected within a quarter, such that the values reported for daily maximum, weekly average, and monthly average were the same. For this reason, the monthly and weekly average monitoring requirements were removed from the draft permit.

E. Discharge Special Conditions

a) The permittee shall submit to the permitting authority projected loadings and a program for maintaining satisfactory treatment levels consistent with approved water quality management plans, only when the effluent discharged over 90 consecutive days exceeds 80% of the permitted flow.

b) The Permittee shall continue to operate the facility to meet the concentration limitations or pounds limitation, whichever is more restrictive.

c) The Permittee shall continue to demonstrate the accuracy of the effluent flow measurement device weekly and report the results on the monthly report forms. The acceptable limit of error is ± 10%.

d) The Permittee shall continue to remove at least 85% of the monthly average concentrations of BOD5 and TSS in the influent into the WWTF. For the purposes of determining whether the Permittee follows this condition, samples from the effluent and the influent shall be taken with appropriate allowance for detention times.

e) The Permittee shall not discharge substances in any kind or quantity that settle to form harmful benthic deposits; float as foam, debris, scum, or other visible substances; produce odor, color, or turbidity that is not naturally occurring and would render the surface water unsuitable for its designated uses; result in the dominance of nuisance species; or interfere with recreational activities; or which would cause a violation of the Vermont Water Quality Standards. This condition is unchanged from the current permit.

f) Condition I.A.3.f is a new condition included in the Draft Permit which specifies the minimum level and the compliance level for Total Residual Chlorine (TRC) to be 0.05 mg/L. Due to public comments received for the Essex Junction Permit renewal, the Final Permit now specifies a compliance level of 0.9 mg/L to reflect the new minimum level or otherwise daily max effluent limitation for TRC. This is further descried in Part V.A.3 of this Fact Sheet. Additionally, the Final Permit Condition III includes a definition for "Minimum Level".

The Permittee shall continue to monitor for Total Residual Chlorine (TRC) when Chlorine is added to the treatment process. Limitations proposed in the permit apply year-round and are compliance effluent limits. In the event no Chlorine was added to treatment process during a month's reporting period, then the Permittee shall report as specified in permit Condition I.A.3.f.

g) The Permittee shall comply with all effluent limitations set forth in the draft permit as any action on the part of the Agency of Natural Resources in reviewing plans and specifications for construction of the wastewater treatment facility shall not relieve the Permittee from compliance responsibilities. This condition is unchanged from the current permit.

h) Total Nitrogen (TN) shall be monitored and or calculated using a CWA approved method and reported as pounds on DMRs.

i) The Permittee shall sample for BOD5, Total Suspended Solids (TSS), Total Phosphorus, TKN, NOx, Total Copper, and Total Zinc composites during the hours 6:00 a.m. to 6:00 p.m., unless otherwise specified. Eight hours is the minimum and 24 hours is the maximum period for the composite.

j) The Permittee shall continue to sample for Settleable Solids during the period of peak flow.

k) The Permittee shall collect Escherichia coli (E. coli) grab samples between the hours of 6:00 a.m. to 6:00 p.m. Total Residual Chlorine sampling should occur when E. coli sampling occurs. This condition is unchanged from the current permit.

l) The Permittee shall continue to monitor and calculate Ultimate Oxygen Demand (UOD) from June 1 - October 31 on an annual basis to comply with the limitations in the draft permit. Methods and limits are unchanged from the draft permit.

m) Total Phosphorus shall continue to be reported by the Permittee as Total Monthly Pounds, Running Total Annual Pounds, and Percentage of Running Total Annual Pounds to Annual Permit Limitation.

n) Monthly average flow shall continue to be calculated by summing the daily effluent flow for each day in the given month and dividing the sum by the number of days of discharge in that month.

VI. Permit Schedule Items

A. Annual Constituent Monitoring (ACM)

For all facilities with a design flow greater than 0.1 MGD, 40 CFR § 122.21(j) requires the submittal of effluent monitoring data for those parameters identified in the draft permit. Samples must be collected once annually such that by the end of the term of the permit, all quarters have been sampled at least once, and the results will be submitted by January 15th of each year.

The suggested sampling seasons are as follows: Winter (January 1 – March 31), Spring (April 1 – June 30), Summer (July 1 – September 30), and Fall (October 1 – December 31). Monitoring for parameters in Condition I of the draft permit shall be coordinated to comply with ACM schedules and requirements.

B. Copper Assessment

In 2003 the effluent limits for metals were challenged during the public comment period for the IBM Corp (Now Global Foundries, LLC) permit for not considering the instream assimilative capacity, or otherwise contribution of metals, specifically Copper and Zinc from the six NPDES direct discharge permitted facilities downstream from Global Foundries, in the Lower Winooski: Essex Junction, South Burlington Airport Parkway, Winooski, Burlington East/Riverside, McNeil Generating Station, and Burlington North. The permit limits for Global Foundries were revised to account for copper loading from the six facilities by subtracting them from the load originally calculated for the facility. Due to the lack of data available in 2003 for each facility downstream, these six facilities received monitor only permit conditions for Copper and Zinc and IBM Corp received metals monitoring limits. This method was re-evaluated for the downstream facilities at permit renewal.

Based on permit monitoring data received, some downstream facilities appeared to be discharging more copper than estimated in 2003 and determined potential concern for the copper assimilative capacity in the Lower Winooski to exceed VWQS. The Secretary presented these findings to stakeholders from the above listed facilities on August 19th, 2020. After meeting, the stakeholders crosschecked facility laboratory bench sheets with the data used for analysis to confirm accuracy. Re-evaluation of the data showed the copper discharged was closer to the 2003 estimates than originally believed but the stretch of river is approaching the available assimilative capacity for copper. However, the data collected during this time was not always analyzed using a method with a sufficient Method Detection Limit (MDL) to assure the data collected was accurate enough to make a concrete finding of reasonable potential.

Given the data uncertainty, permit limits are not included for municipal facilities discharging downstream of Global Foundries. To continue to investigate the issue, the draft permit requires effluent copper analyses to be carried out using a method with a Method Detection Limit (MDL) of 0.006 mg/L or below. This level of detection is deemed to be reasonably achievable as EPA methods 200.7 and 200.8 listed in 40 C.F.R. Part 136 have estimated detection limits of 0.0054 mg/L and 0.004 mg/L, respectively. Influent copper monitoring is also required to quantify the amount of copper loading to the facility and estimate copper removal within the WWTF.

In addition, facilities are required to conduct and submit the results of an Industrial Waste Survey (Survey). This effort is intended for facilities to establish a list of connections where copper may enter the system from Significant Industrial Users (SIUs), waste haulers, and root treatment specialists, and to then categorize those dischargers. Significant industrial users are best defined in Section III (Definitions) of the permit. The list shall also include waste hauling companies that the facility accepts septage from and root treatment specialists that may contribute to copper loading at the WWTF. The list supports future efforts to characterize influent copper sources further, should they be necessary. It is not expected for the Permittee to track down the varying waste hauler customers for this Survey.

The Survey shall track the SIUs, waste hauler or other root treatment specialist and include each entity's business name, address, contact information, NPDES Direct Discharge or Pretreatment permit number, number of any other environmental permits as they apply, and wastewater allocations as they apply. It is

expected for the Plan to describe the SIU's industrial activity and manufacturing process that may be a source for copper loading to the WWTF.

Each SIU and activity identified to contribute to the treated copper loading at the WWTF shall specify a qualitative estimate option that ranks the potential load for copper to be present in the waste stream as high, moderate, or low impact. It is not expected for the Permittee to conduct tests or additional monitoring to identify where exactly the SIU's discharge ranks within the high range for >10 lbs/yr, the moderate range for <10 lbs/yr but greater than 1lb/yr, or the lower range for <1 lb/yr. Only a rough estimate, or guess, is needed.

The Industrial Waste Survey shall have a rough estimate average daily and maximum daily process water volume treated by the WWTF for each facility. The Survey shall note whether the industrial facility utilizes wastewater management practices and describe, as necessary.

This Survey is due two years after the permit effective date, by August 1, 2023, as specified in Condition I.D.5 of the final permit.

C. Emergency Power Failure Plan

To ensure the facility can continue operations during the event of a power failure, permittees are required to have Emergency Power Failure Plans on file. Within 90 days of the effective date of the permit, the Permittee must ensure this plan is up-to-date by submitting to the Secretary updated documentation addressing how the discharge will be handled in the event of an electric power outage.

The Permittee's responsibility under this condition remains unchanged from the current permit.

Plans referenced in permit Conditions I.E and F may be combined for submittal.

D. Operations Management Emergency Response Plan (OMERP)

As required by the revisions to 10 V.S.A. Section 1278 the Permittee shall implement the Operation, Management, and Emergency Response Plan on file. This condition requires that the Permittee implement the Operation, Management, and Emergency Response Plans for the WWTF and sewage collection system as approved by the Agency on June 27, 2008.

To ensure this plan remains up-to-date, the Permittee shall prepare and submit to the Agency for review and approval an Operation, Management, and Emergency Response Plan for the WWTF, sewage pump/ejector stations, stream crossings, and sewagecollection system within 180 days from the effective date of the permit.

The Permittee's responsibility under this condition remains unchanged from the current permit. Plans referenced in permit Conditions I.E and F may be combined for submittal.

E. Phosphorus Optimization Plan

To ensure the facility is operating as efficiently as possible for purposes of phosphorus removal, the permit requires the Permittee to develop or update (as appropriate), and submit to the Secretary, a Phosphorus Optimization Plan (POP) by September 30, 2022, to increase the WWTF's phosphorus removal efficiency by implementing optimization techniques that achieve phosphorus reductions using primarily existing facilities and equipment within 60 days of the POP due date. The techniques to be evaluated may include operational process changes to enhance biological and/or chemical phosphorous removal, incorporation of anaerobic/anoxic zones, septage receiving policies and procedures, and side stream management.

The facility shall have 12 months from the permit effective date to optimize removal of total phosphorus. If, after the 12-month optimization period, the WWTF's actual TP loads reach or exceed 80% of the LC TMDL WLA for the WWTF, based on the WWTF's 12-month running annual load calculated using the Phosphorus Load Calculation the Permittee shall, within 90 days of reaching or exceeding 80% of the LC TMDL WLA for the WWTF, develop and submit to the Secretary a projection based on the WWTF's current operations and expected future loadings of whether it will exceed its WLA during the permit term.

If the facility is not projected to exceed its WLA within the permit term, the WWTF shall reassess when it is projected to reach its WLA prior to permit renewal and submit that information with its next permit application. If the facility is projected to exceed its WLA during the permit term, the permittee shall submit a Phosphorus Elimination/Reductio n Plan (PERP) within 6 months to the Secretary to ensure the WWTF continues to comply with its WLA. The PERP shall be treated as an application to amend the permit, and therefore, shall be subject to all public notice, hearing, and comment provisions, in place at the time the plan is submitted, that are applicable to permit amendments. The WWTF shall revise the PERP, if required by the Secretary.

F. Pollutant Scan (greater than 1 MGD)

The Toxic Pollutants Scan is codified at 40 C.F.R. § 401.15, Table 1. This requires the Permittee to conduct an effluent analysis of S/N 001 for the pollutants included in Appendix J, Table 2 of 40 C.F.R. Part 122 and submit the results to the Secretary. Based on the results of these tests or any other toxicity tests conducted, the Secretary may require additional WET testing, or a Toxicity Reduction Evaluation be conducted.

These tests shall align with the monitoring of the first three WET tests when they occur, in such a way that 3 Pollutant Scans are completed within the permit term.

G. Quality Assurance Report / Proficiency Testing

To ensure there are adequate laboratory controls and appropriate quality assurance procedures, the Permittee shall conduct an annual laboratory proficiency test for the analysis of all pollutant parameters performed within their facility laboratory and reported as required by their NPDES permit. Proficiency Test samples must be obtained from an accredited laboratory or as part of an EPA DMR-QA study. These results shall be submitted to the Secretary by December 31, on an annual basis.

H. Whole Effluent Toxicity (WET) Testing Acute/Chronic

40 C.F.R. Part 122.44(d)(1) requires the Secretary to assess whether the discharge causes or has the reasonable potential to cause or contribute to an excursion above any narrative or numeric water quality criteria. Per these federal requirements, the Permittee shall conduct WET testing and toxic pollutant analyses according to the schedule outlined in the draft permit. If the results of these tests indicate a reasonable potential to cause an instream toxic impact, the Secretary may require additional WET testing, establish a WET limit, or require a Toxicity Reduction Evaluation.

Four 2-species (*Ceriodaphnia dubia* and *Pimephales promelas*) 48-hour acute and 96-hour chronic tests are recommended for the draft permit, two during the summer (August/October) and two during the winter (January/February). It is also suggested that concurrent sampling and analysis for Total Kjeldahl Nitrogen, Total Residual Chlorine, and priority pollutants be conducted with each of these tests.

I. Engineering Evaluation

An engineering evaluation is required once every 20 years, and per DEC records, this was last completed for the Winooski WWTF in 1996. The Agency is aware the facility has undergone more recent upgrades at the WWTF and within the collection system. Because the Draft Permit includes a compliance schedule that requires completion of upgrades during this permit cycle, the Basis for Final Design or Preliminary Engineering Report for planned upgrades shall satisfy this requirement for equipment added to the facility. All parts of the WWTF and collection system that have not been replaced or refurbished since 2014, seven years ago, should be accounted for in the engineering evaluation due December 1, 2022.

VII. General Conditions

A. Electronic Reporting

The National Pollution Discharge Elimination System (NPDES) Electronic Reporting Rule (eRule) modernized Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The eRule requires the inclusion of electronic reporting requirements in NPDES permits that become effective after December 21, 2015. The rule requires that NPDES regulated entities that are required to submit discharge monitoring reports (DMRs), including majors and nonmajors, individually permitted or covered by a general permit, must do so electronically after December 21, 2016. The Secretary has created an electronic reporting system for DMRs and has trained facilities in its use. As of December 21, 2020, these NPDES facilities must also submit additional information electronically as specified in Appendix A in 40 C.F.R. Part 127.

B. Noncompliance Notification

As required by 10 V.S.A. § 1295, a Noncompliance Notification has been included in the draft permit. Section 1295 requires the Permittee to provide public notification of untreated discharges from wastewater

facilities. The Permittee is required to post a public alert within one hour of discovery and submit to the Secretary specified information regarding the discharge within 12 hours of discovery.

C. Reopener

The draft permit includes a reopener clause whereby the Secretary reserves the right to reopen and amend the permit to implement an integrated plan to address multiple Clean Water Act obligations.

VIII. Final Determinations

The public comment period for receiving comments on this draft permit was from April 7, 2021 through May 7, 2021. The comments received are addressed in the attached Responsiveness Summary.

Agency of Natural Resources
Department of Environmental Conservation
Watershed Management Division
1 National Life Drive Davis 3
802-828-1535

MEMORANDUM

Prepared by: Jamie Bates, Wastewater Program (WWP)

Cc: Amy Polaczyk, Manager, WWP
Bethany Sargent, Manager, Monitoring and Assessment Program (MAP)
Rick Levey, MAP

Date: April 5, 2021 (***Revised April 29, 2021)***

Revisions resulting from public comments received during the public notice period are bolded and italicized.

Subject: Reasonable Potential Determination for the Winooski WWTF Facility

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Facility Information:
Winooski Wastewater Treatment Facility
Winooski, VT
Permit No. 3-1248
NPDES No. VT0100510
Facility Location: 44.49050, -73,19747 (NAD 83)
Approximate Outfall Location: 44.48978, -73.19892 (NAD 83)

Receiving water: Winooski River

Hydrology:
Facility Design Flow: 1.400 MGD = 2.166 CFS
Estimated 7Q10[1] = 147.0 CFS
Estimated LMM[2] = 482.3 CFS
Estimated MAF[3] = 1257 CFS

Instream Waste Concentration at 7Q10 Flow (IWC-7Q10) = 0.015 (>1%)
Instream Waste Concentration at Low Median Monthly Flow (IWC-LMM) = 0.0045 (<1%)

The Town of Winooski owns and operates the Winooski Wastewater Treatment Facility which treatment is conducted by means of activated sludge, phosphorus removal, chlorination and dechlorination..

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[1] Using daily mean streamflows, the flow of the receiving water equal to the minimum mean flow for seven consecutive days, that has a 10% probability of occurring in any given year.

[2] "Low median monthly flow". Using daily mean streamflows, the median monthly flow of the receiving water for that month having the lowest median monthly flow.

[3] "Median annual flow". Using the mean daily flow that is equaled or exceeded 50 percent of the time for the analysis period. Where statistically significant trends in annual median stream flows exist for long-term records, the analysis period is limited to the most recent 30-years.

The Winooski River downstream of the Winooski WWTF discharge is a Class B (2) water and is designated as a seasonal Warm (June 1 - September 30) and Cold (October 1 – May 31) Water Fish Habitat. At the point of discharge, the river has a contributing drainage area of 1050.0 square miles. The existing permit waste management zone (WMZ) in the Winooski River begins at the outfall of the WWTF and extends downstream approximately 1.0 mile pursuant to 10 V.S.A., Section 1252.

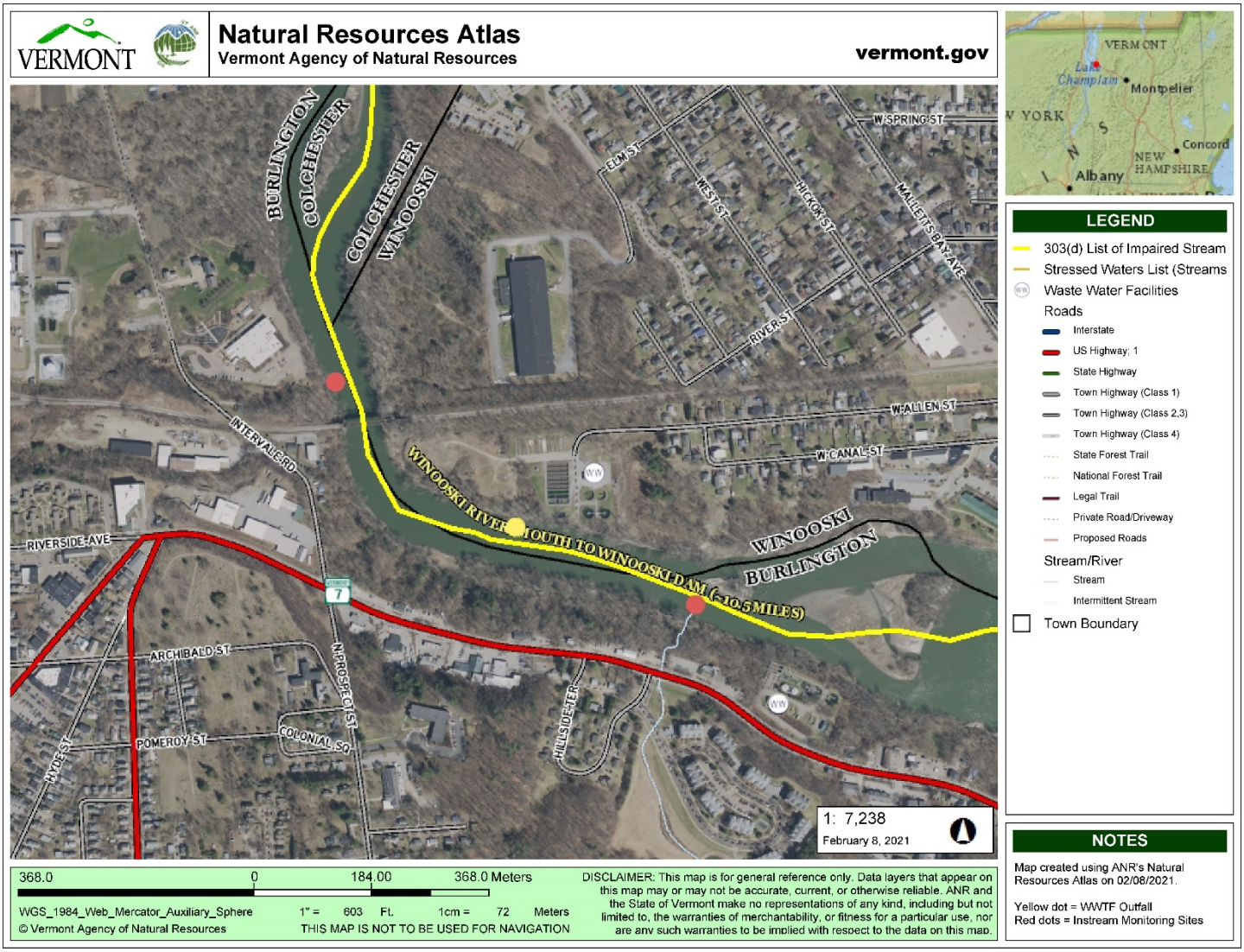

*Figure 1. Winooski River near the Winooski WWTF. The facility location is represented by a white dot containing "WW", the outfall location is represented by a yellow dot and arrow, and upstream (River Mile (RM) 9.3) and downstream (RM 9.0) monitoring locations are represented by red dots. Other NPDES Direct Discharge permitted facilities, are nearby and labeled in black boxes. Figure produced with the Vermont Agency of Natural Resources Natural Resource Atlas (*https://anrmaps.vermont.gov/websites/anra5/).

This memo is organized into the following sections for the Winooski WWTF:

- Summary of Effluent Data
- Summary of Instream Ambient Chemistry Data
- Biological Assessments upstream and downstream from the WWTF outfall
- Assessment of Reasonable Potential for effluent discharge to exceed Vermont Water Quality Standards (VWQSs)

Effluent Data for the Winooski WWTF

Table 1. Effluent Data for the Winooski WWTF from 5/31/2015 to 3/31/2020.

Parameter	Current Permit Limit	Minimum Discharge	Average Discharge	Maximum Discharge	N
Annual ***Average*** Flow (MGD)	1.4	0.36	0.66	1.13	58
Monthly Average BOD_5 (mg/L)	30	1.00	2.15	6.20	58
Monthly Average BOD_5 lbs/day	300	1.00	11.61	36.90	58
Water Temp (°C)	ACM	9.5	14.91	23.5	9
pH	6.5 - 8.5	**6.85**[1]	6.99	7.14	58
Hardness (mg/L)	ACM	35	27.33	47	3
DO (mg/l)	ACM	3.7	5.40	6.7	9
Monthly Average Total Suspended Solids (mg/L)	30	1.40	4.01	10.00	57
Monthly Average Total Suspended Solids (lbs/day)	300	2	22.41	71.3	57
Total Residual Chlorine (mg/L)	1.48	0.52	0.94	1.32	59
Total Phosphorus (mg/L)	0.8	0.18	0.45	0.79	64
Total Nitrogen (mg/L)	ACM	8.1	11.36	14.87	4
Total Kjeldahl Nitrogen (mg/L)	Monitor Only	0.77	2.37	13	29
Nitrate (mg/L)	ACM	2.1	12.25	23	10
Nitrite (mg/L)	ACM	0.1	0.11	0.2	10
Ammonia (as N) mg/L (summer ≈ June 1 - October 31)	ACM	0.12	0.26	0.50	4
Ammonia (as N) mg/L (winter ≈ November 1 - May 31)	ACM	0.025	0.10	0.3	6
Oil and Grease (mg/L)	ACM	1	1.1	2	10
E. coli (CFU/100 ml)	77	2	35.80	**580**[2]	60
Antimony (mg/L)	ACM	**0.001**[3]	0.001	0.001	3
Arsenic (mg/L)	ACM	**0.001**[3]	0.001	0.001	3
Beryllium (mg/L)	ACM	**0.001**[3]	0.001	0.001	3
Calcium (mg/L)	ACM	11	15.00	15	3
Cadmium (mg/L)	ACM	**0.001**[3]	0.001	0.001	3
Copper (mg/L)	Monitor Only	0	0.02	0.02	61
Lead (mg/L)	ACM	**0.0005**[3]	0.0005	0.0005	3
Magnesium (mg/L)	ACM	1.9	2.40	2.4	3
Nickel (mg/L)	ACM	**0.01**[3]	0.01	0.01	3
Selenium (mg/L)	ACM	**0.001**[3]	0.001	0.001	3
Silver (mg/L)	ACM	**0.01**[3]	0.01	0.01	3
Thallium (mg/L)	ACM	**0.0005**[3]	0.002	0.002	3
Zinc (mg/L)	Monitor Only	0	0.05	0.059	28
Cyanide (mg/L)	ACM	**0.005**[3]	0.01	0.005	3
Phenols (mg/L)	ACM	0.005	0.04	0.037	3
% Removal BOD	85	97.00	99.05	100	58
Settleable Solids (ml/L)	1	0	0.053	1	58
% Removal Suspended Solids	85	94	96.17	99	58
Ultimate Oxygen Demand (lbs/day)	850	15	40.62	212	24

[1] *The minimum pH observed within the specified timeframe is less than the minimum limit 6.5 pH; reported once on 11/30/2015* ***via ANR Online report submissions. This field received public comment during the public noticing period, stating the minimum value reported for this date was 6.85 s.u. not 6.4. Previously submitted WR-43's for November 2015 confirm the value was 6.85 s.u. and has been corrected.***

[2] *E. Coli permit limit of 77 CFU/100 ml was exceeded four times within the timeframe specified. The max result 580 CFU/100 ml was observed on 9/30/2015. The most recent exceedance was observed on 11/30/2017 at 170 CFU/100ml.*

[3] *Values shown were observed below method detection limit, or reporting limit (RL), but were included to show the number of effluent tests conducted during the current permit term.*

Whole Effluent Toxicity Data Summary:
Whole Effluent Toxicity (WET) data for this facility is presented below in Table 2. No WET limits were included in the previous permit.

Table 2. Whole Effluent Toxicity Test Results for the Winooski WWTF.

	Pimphales promelas	
Test Start Date	Acute	
	NOEC %	LC50 %
8/5/2005	100%	>100%
2/15/2006	100%	>100%
8/23/2007	100%	>100%
1/17/2008	100%	>100%

Analysis of the acute WET test data indicates that this facility's effluent does not contain toxic substances that cause acute toxicity in the receiving water for species *Pimphales promelas*. The IWC for this facility is 0.015 at 7Q10. The lowest observed acute No Observable Effect Concentration (NOEC) is 100% effluent concentration found in the receiving waters under 7Q10 and full design flow conditions.

To provide additional data for future assessments of WET reasonable potential, it is recommended that four 2-species (Ceriodaphnia dubia and Pimephales promelas) 48-hour acute and 96-hour chronic tests be included in the draft permit, two during the summer (August/October) and two during the winter (January/February). It is also suggested that concurrent sampling and analysis for Total Kjeldahl Nitrogen, Total Residual Chlorine, and priority pollutants be conducted with each of these tests.

Data for the Winooski River above and below the Winooski WWTF
MAP maintains the VTDEC assessment database, an EPA-required database which describes the conditions of Vermont's surface waters with respect to their attainment of VWQS. This facility ultimately discharges to Lake Champlain and is subject to the 2016 Lake Champlain Phosphorus TMDL.

Biological Assessments*:*
The receiving waters of this warm water moderate gradient reach are non-wadeable as such macroinvertebrate biomonitoring assessments have not been conducted above or below the outfall.

Ambient Chemistry Data:
The most recent ambient chemistry data available from VTDEC sampling is from 8/19/2010 and 9/3/2010, when surface waters were sampled above the outfall at River Mile (RM) 9.3 and below the outfall at RM 9.0. No data was available from LaRosa volunteers to use for this assessment. The upstream sampling location is approximately 0.18 miles upstream and the downstream sampling location is approximately 0.23 miles downstream from the Winooski WWTF outfall (Figure 1).

Data representativeness are assessed by evaluating the observed flow conditions from field sheets - whether measured or qualitatively described - at which samples were collected. Other contemporaneous streamflow data, such as the U.S. Geological Survey stream gage network, are also taken into consideration where proximal and representative of the hydrologic conditions at the time (e.g., unimpacted by artificial flow regulation). The downstream sampling location at this site is the most sensitive location, and the sampling results are determined to be representative of low flows based upon review of available streamflow observations. Thus, the data presented below are relevant for inclusion in this analysis. Water chemistry measures of relevant parameters for this assessment are summarized in Tables 3a and 4b.

Data used to evaluate instream chemistry is collected under low flow conditions (typically August or September) when

turbidity is low, and no precipitation has been observed for 3 days.

Table 3a. Surface-water quality data above and below the Winooski Wastewater Treatment Facility collected by VTDEC.

Visit Date	Above or Below (A/ B)	RM	Water Temp (deg C)	pH	Alkalinity (mg/l)	Conductivity (umho/cm)	Hardness (mg/l as CaCO3)	DO (%)	DO (mg/l)	Turbidity (NTU)	Total Color (PCU)	Dissolved Inorganic Carbon (mg/l)	Dissolved Organic Carbon (mg/l)	Chloride (mg/l)	Total Phosphorus (ug/l)	Total Dissolved Phosphorus (ug/l)	Total Nitrogen (mg/l)	Total Ammonia Nitrogen (mg/l)	Total Nitrate/ Nitrite Nitrogen (mg/l)
8/19/2010	A	9.3	24.8	8.15	64.3	239	72.6	97.4	8.04	1.74	20	-	-	25.7	16.2	9.87	0.82	<0.05	0.78
	B	9.0	24.9	8.16	64.7	240	73.6	99.9	9.21	1.47	20	-	-	25.6	19.8	12.5	0.9	<0.05	0.8
9/03/2010	A	9.3	25.6	8.10	68.2	258	80.1	103.6	8.37	1.43	17.5	-	-	27.8	19.5	12.6	0.91	<0.05	0.74
	B	9.0	25.6	8.07	69	258	80.6	103.4	8.36	1.46	17.5	-	-	36.3	18.9	16.6	0.99	<0.05	0.74
8/13/2020	A	9.3	25.5	7.56	55.8	267.4	68.2	101.5	8.16	4.1	25	12.2	3.6	37.4	17.4	-	0.72	<0.05	0.498
	B	9.0	25.3	7.60	56.6	262.3	70.6	92.6	7.45	4.3	27	12.1	2.4	36.8	16.5	-	0.72	<0.05	0.498

Table 3b. Surface-water quality (metals) data upstream and downstream of the Winooski Wastewater Treatment Facility collected by VTDEC.

Visit Date	Above or Below (A/ B)	RM	Water Temp (deg C)	pH	Conductivity (umho/cm)	Hardness (mg/l as CaCO3)	Total Aluminum (ug/l)	Total Antimony (ug/l)	Total Arsenic (ug/l)	Total Beryllium (ug/l)	Total Cadmium (ug/l)	Total Calcium (mg/l)	Total Chromium (ug/l)	Total Copper (ug/l)	Total Iron (ug/l)	Total Lead (ug/l)	Total Magnesium (mg/l)	Total Manganese (ug/l)	Total Molybdenum	Total Nickel (ug/l)	Total Potassium (mg/l)	Total Selenium (ug/l)	Total Silver (ug/l)	Total Sodium (mg/l)	Total Sulfate (mg/l)	Total Thallium (ug/l)	Total Zinc (ug/l)	Total Uranium (ug/l)	Total Vanadium (ug/l)
8/19/2010	A	9.3	24.8	8.15	239	72.6	40.6	<10	<1	<1	<1	23.6	<5	<10	117	<1	3.32	46.5	-	<5	1.49	<1	< 1	16.7	10.3	<1	<50	-	-
	B	9.0	24.9	8.16	240	73.6	40.8	<10	<1	<1	<1	24	<5	<10	124	<1	3.33	48.3	-	<5	1.43	<1	< 1	16.9	9.35	<1	<50	-	-
9/03/2010	A	9.3	25.6	8.10	258	80.1	32.7	<10	<1	<1	<1	25.8	<5	<10	135	<1	3.84	56.1	-	<5	1.53	<1	< 1	17.9	11.7	<1	<50	-	-
	B	9.0	25.6	8.07	258	80.6	31.2	<10	<1	<1	<1	26	<5	<10	122	<1	3.83	52.6	-	<5	1.55	<1	< 1	17.9	11.4	<1	<50	-	-
8/13/2020	A	9.3	25.5	7.56	262.3	68.2	103	<5	<1	<1	<1	21.8	<1	<5	<1	<1	3.34	70.7	<5	1	1.29	<1	<1	22.6	13.6	<1	<10	<1	<1
	B	9.0	25.3	7.60	267.4	70.6	97	<5	<1	<1	<1	22.6	<1	<5	<1	<1	3.44	65.4	<5	<1	1.35	<1	<1	23	13.5	<1	<10	<1	<1

Assessment of Reasonable Potential of the Winooski WWTF discharge to exceed Vermont Water Quality Standards

Methodology:

A steady-state mass balance approach was used to assess reasonable potential for the potential pollutants of concern based on the methods described in the Technical Support Document for Water Quality-based Toxics Control (TSD; EPA/505/2-90-001). The expected receiving water concentrations (RWC; C_r) of pollutants were calculated according to Equation 1 at critical conditions. If the expected receiving water concentration determined exceeds the applicable Vermont Water Quality Standard, limits must be included in the permit. Tables 5, 6, and 7 present this analysis for the Winooski WWTF.

$$\text{Equation 1.} \quad C_r = \frac{(Q_e)(C_e)+(Q_s)(C_s)}{Q_r}$$

Where:
C_r = resultant expected receiving water pollutant concentration (mg/L or ug/L)
Q_e = maximum permitted effluent flow (cfs).
C_e = critical effluent pollutant concentration (mg/L or ug/L)
Q_s = stream flow upstream of the point of discharge (cfs). Low Median Monthly flow for nutrients, 7Q10 for applying toxics criteria. When applicable, 30Q10 is used for chronic Total Ammonia Nitrogen assessments.
C_s = critical background in-stream pollutant concentration (units dependent on parameter, typically mg/L or ug/L).
$Q_r = (Q_s + Q_e)$ = resultant in-stream flow, after discharge (cfs)

NPDES regulations at §122.44(d)(1)(ii) require that permit writers consider the variability of the pollutant in the effluent when determining the need for Water Quality-Based Effluent Limits (WQBELs). EPA guidance for permit writers on how to characterize effluent concentrations of certain types of pollutants using a limited data set and accounting for variability is detailed in the TSD. The current analysis uses the TSD procedure to project a critical effluent concentration (C_{etsd}) of the 95th percentile of a lognormal distribution of observed effluent concentrations over 5 years. The 95th percentile is calculated from the effluent data set using the number of available effluent data points (n) for the measured concentration of the pollutant and the coefficient of variation (CV) of the data set to predict the critical pollutant concentration in the effluent. When less than 10 data points are available, the CV is set to 0.6. For less than 10 items of data, the uncertainty in the CV is too large to calculate a standard deviation or mean with sufficient confidence (TSD). The CV and n are used to determine the factor (TSD pg 54) that is multiplied by the maximum observed effluent concentration (C_e) to determine C_{etsd}.

$$\text{Equation 2.} \quad C_{etsd} = TSD_{factor} \times C_e$$

Where:
C_{etsd} = Effluent concentration adjusted to 95th percentile value (mg/L or ug/L)
TSD_{factor} = Factor based upon EPA TSD Table 3-2, pg 54
C_e = critical (maximum observed) effluent pollutant concentration (mg/L or ug/L)

Results for C_{etsd} values were substituted for Ce in Equation 1, to calculate the resultant expected receiving water pollutant concentration. This variable is characterized as C_{rtsd} (Crtsd) to differentiate between the two methods: mass balance where the TSD method is applied and not applied.

The Instream Waste Concentration (IWC) is a measure of the effluent dilution and is also used as an estimate of the facility's potential to cause or contribute to an excursion of the VWQS. The IWC equation is the simplification of the flow portion of the mass balance equation (Equation 1) and is shown below in Equation 3:

$$\text{Equation 3.} \quad IWC = \frac{(Q_e)}{(Q_r)}$$

The critical effluent pollutant concentration (C_e) can be multiplied by the IWC to approximate the resultant receiving water concentrations (C_r).

This analysis of reasonable potential used the following data and assumptions:

- Average values of observed upstream and downstream chemical data were used for most calculations; exceptions are described below.
- Upstream pollutant concentrations (Cs) were set equal to half the Reporting Limit (RL) when data were censored at the Reporting Limit. The reporting limit (RL) is the minimum value reported as a detection according to the 2020 VAEL methods for constituent detection.
- Effluent concentrations (Ce) were set equal to the RL when data was not available, or where the number of samples for metals did not exceed three test results, or where the number of samples for nutrients and non-metals did not exceed ten test results.
- Effluent pollutant concentrations (Ce) were set to the maximum observed effluent concentrations * TSD 95th percentile multiplier over the last 5 years of data collected. The symbol Cetsd is used to represent this value.
- Seasonal TAN limits were calculated using the highest observed pH at assumed temperatures 25°C for samples collected in the summer (June 1- October 31) and 5°C for winter (November 1 – May 31).
- Hardness for determining hardness-dependent metal criteria is based upon the lowest observed downstream concentration (73.6 mg CaCO3/L).
- Chlorine analysis was conducted using the highest value result for instantaneous maximum concentration effluent * TSD 95th percentile multiplier.

The spreadsheet used for these calculations is part of the permit record and available upon request.

Non-Metals

The results of mass balance calculations for Total Residual Chlorine (TRC), seasonal Total Ammonia Nitrogen, summer Total Kjeldahl Nitrogen, and E. coli were calculated using Equation 1 are presented in Table 5 below.

Table 5. Mass Balance for Ammonia, and E. coli around the Winooski WWTF

	Units	Total Residual Chlorine	Total Ammonia Nitrogen – Summer	Total Ammonia Nitrogen - Winter	Total Kjeldahl Nitrogen - Summer	*E. coli*	Notes
Qs	CFS	147					*Estimated 7Q10 flow*
Qe	CFS	2.166					*permitted effluent discharge*
Qr = Qs + Qe	CFS	149.17					*Qs+Qe*
7Q10 IWC		0.015					*Qe/(Qs+Qe)*
Cs	mg/L or for E. Coli CFU/100 ml	0	0.025	0.025	0.025	0	*upstream pollutant concentration (reported below reporting limit or was not available—assumed ½ the reporting limit)*
N		59	6	4	29		*Number of data points within the effluent data set*
Ce	mg/L	1.32	0.50	0.30	13		*effluent pollutant concentration, maximum observed.*
C_{etsd}	mg/L or for E. Coli CFU/100 ml	1.45	1.30	0.63	22.1	77	*effluent pollutant concentration adjusted by TSD factor (permit limit for E.coli)*
Cr = (CsQs+CeQe)/Qr	mg/L	0.019	0.031	0.029	0.21		*resultant pollutant concentration in receiving water without the TSD method*
Crtsd = (CsQs+CetsdQe)/Qr	mg/L or for E. Coli CFU/100 ml	0.021	0.044	0.034	0.35	1.12	*resultant pollutant concentration in receiving water using TSD method*
Temperature	Degrees Celsius		25.00	5.00	25		*Values used in analysis.*
pH	s.u.		8.16	8.16	8.5		*Values used in analysis. Worst case scenario pH assumed for TKN.*
Hardness as $CaC0_3$	mg/L	73.60					*Min. Downstream Value*
Fish Habitat		Seasonal Warm and Cold Water					*Fishery Type. VTWQS Appendix A, Warm Water Fish Habitat: "Winooski River from Green Mountain Power Coroporation #19 in Essex/Williston to its confluence with Lake Champlain - June 1, through September 30, only"*
		Oncorhynchus (e.g., Rainbow trout) Present					*Additional Fishery Information*
VWQS Criteria (2017)							
Primary Contact Recreation	CFU/100 ml					235	
Protection of Aquatic Biota – Acute	mg/L	0.019	1.92	4.17	0.98		VWQS adjusted for TKN conservative instream assumptions for Temperature and pH.
Protection of Aquatic Biota – Chronic	mg/L	0.011	1.11	3.55	0.63		VWQS adjusted for TKN conservative instream assumptions for Temperature and pH.
Exceedance Calculated?							
Primary Contact Recreation						NO	
Protection of Aquatic Biota - Acute		YES	NO	NO	NO		*VWQS/EPA Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater was updated in 2013.*
Protection of Aquatic Biota - Chronic		YES	NO	NO	NO		

Table 5 presents the mass balance for Total Ammonia Nitrogen ("TAN" or "Ammonia"), Total Kjeldahl Nitrogen ("TKN"), and E. coli around the Winooski WWTF. E. coli was not monitored within the receiving water and assumed to be 0 CFU/100 ml. TAN upstream pollutant concentrations (C_s) were set equal to one half the Reporting Limit (RL) when data were censored at or below the Reporting Limit (0.05 mg/L / 2 = 0.025 mg/L). The critical effluent concentration (Ce) was assumed to be the worst-case discharge scenario and equal to the maximum observed TAN concentrations 0.5 mg/L for summer and 0.3 mg/L for winter.

Due to the lack of effluent data available for TAN ($n \leq 10$/season), summer TKN values ($n = 29$) were substituted for TAN concentrations for comparison. The max observed TKN concentration was 13 mg/L, and when assessed using the TSD method 14.3 mg/L. The VWQS for this assessment considered critical conditions: an upstream pH of 8.5 s.u. and temperature of 25 degrees Celsius, versus the maximum observed pH and temperature observed upstream.

Based on the 7Q10 IWC, the data available, and conservative assumptions made for TAN values for Cs, this facility does not have Reasonable Potential to discharge Total Ammonia Nitrogen and E. Coli in amounts that would exceed the VWQS.

E. Coli shall continue to be monitored for the next permit term.

Estimates calculated using values reported for Total Kjeldahl Nitrogen (TKN) in lieu of the TAN, data did not raise concerns that TAN effluent concentrations are violating the VWQS. For this reason, continued TKN monitoring is recommended in lieu of additional TAN monitoring for the permit. The current permit requires weekly TKN monitoring as a "monitor only" condition, and not proposed to change. Monitoring Schedules shall coincide with proposed Total Nitrogen requirements described later in this document.

Water quality criteria and limit estimates were not explored using methods described in Chapters 4 and 5 of the TSD and the 2013 EPA Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater (EPA 822-R-13-001).

Total Residual Chlorine

TRC consists of the sum of free chlorine and combined chlorine. Chlorine is a toxic substance with strict acute and chronic criteria. The existing TRC weekly average limit of 0.86 mg/L and daily instantaneous maximum limit of 1.48 mg/L were assessed to identify whether the VWQS are supported. The assessment proved that the existing limits are not protective of the VWQS. For this reason, the TRC Water Quality Based Effluent Limits (WQBELs) were evaluated assuming the VWQS chronic (11 µg/L) and acute criteria (19 µg/L) for protecting aquatic biota were equal to the pollutant effluent concentration. Methods for how the WQBELs were calculated are best described in the attached "*WQBEL Permit Limit Review and Calculations for the Winooski WWTF Facility (3-1254)".*

A new daily maximum limit for 0.9 mg/L-TRC and monthly average limit for 0.5 mg/L-TRC is proposed for the draft permit. Based on data reported, on average (based on instantaneous max values) the facility discharges about 0.9 mg/L-TRC. The facility should have no issue meeting these new limits. Monitoring frequency for TRC should remain daily. The facility shall dechlorinate as needed to meet the new TRC limit. Prevention of high chlorine discharges can be mitigated with the use of best management practices, routine inspections, and good housekeeping practices.

Due to the current permit limits not being protective of the WQS, RP concerns were observed and are shown in Table 5. The WWTF was chlorinating and dechlorinating to the permitted TRC limit for permit compliance, as such the effluent data collected was not beneficial for this RP analysis.

Metals
The current permit includes a "monitor only" quarterly condition for Copper (Cu) and Zinc (Zn); for both maximum daily and monthly average concentrations. Each metal was assessed using Equation 1, presented in Table 6, to verify the effluent meets water quality standards.

Table 6. Mass Balance for Metals of Concern around the Winooski WWTF

		Metal (Total)	
Variables	**Units**	**Copper**	**Zinc**
Hardness as $CaCO_3$	mg/L	73.60	
Qe	CFS	2.17	
Qs (7Q10)	CFS	141.12	
Ce (Max)	ug/L	20	59
Cetsd	ug/L	24	77
Cs (half VAEL Reporting Limit)	ug/L	5.00	25.00
Qr (7Q10)= Qs (7Q10) + Qe	CFS	143.29	
Cr = (QeCe+QsCs)/Qr	ug/L	5.23	25.51
Crtsd = (QeCetsd+QsCs)/Qr	ug/L	5.29	25.78
VWQS Aquatic Biota Acute limit	ug/L	10.49	92.41
VWQS Aquatic Biota Chronic limit	ug/L	7.18	92.41
VWQS exceedance?	Acute	NO	NO
	Chronic	NO	NO

No RP concerns were observed for Aluminum, Antimony, Arsenic, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, and Zinc to discharge in toxic amounts.

The instream and effluent data sets used to perform these calculations were limited in the number of measurements completed for all metals, except Cu and Zn. Receiving water quality should continue to be monitored, and the potential for metals in the effluent to violate VWQS should be revisited as instream sampling methods improve for non wadeable VT waters and method detection limits get more stringent for data collection.

Further monitoring is necessary to assess pollutant assimilative capacity concerns for Total Zinc and Copper within the Winooski River. Both Total Cu and Zn shall continue to be monitored in the effluent to assess the assimilation capacity of metals in the Lower Winooski River. A monthly sampling frequency is proposed for daily maximum mass quantity and concentration, for Total Copper and Zinc, in the draft permit.

The next permit should also include a monitoring condition for Appendix J, Table 2 priority pollutants. Monitoring should coincide with WET tests when they occur such that three tests are conducted in the 5-year permit term.

Nutrients
The results of mass balance calculations for Total Nitrogen and Total Phosphorus were calculated using Equation 1 are presented in Table 7 below.

Table 7. Assessment of Nutrients of Concern around the Winooski WWTF

	Units	Total Phosphorus	Total Nitrogen	Notes
Qs	CFS	482.3		*Estimated LMM flow*
Qe	CFS	2.166		*permitted effluent discharge*
Qr = Qs + Qe	CFS	484.43		*Qs+Qe*
LMM IWC		0.0045		*Qe/(Qs+Qe)*
Cs	mg/L	0.018	0.72	*upstream pollutant concentration (average)*
Ce	mg/L	0.79		*Max observed effluent concentration*
Cetsd	mg/L	0.95	38.66	*effluent pollutant concentration adjusted by TSD method.*
Cr = (CsQs+CeQe)/Qr	mg/L	0.02		
Crtsd = (CsQs+CetsdQe)/Qr	mg/L	0.022	0.173	*calculated resultant downstream pollutant concentration*
Stream Type		B Warm Water, Medium Gradient		
Calculated Instream Contribution from Effluent	mg/L	0.004	0.169	*difference between observed upstream concentration and calculated resultant downstream concentration. Mass Balance Method*
VWQS Criteria (2017)			None for Streams	
Threshold Criteria	mg/L	0.027		
VWQS Exceeded?		No		

Total Nitrogen:
TN is the sum of nitrate, nitrite, ammonia, soluble organic nitrogen, and particulate organic nitrogen. To gather data on the amount of Total Nitrogen (TN) in this discharge and its potential impact on the receiving water, monthly "monitor only" requirements for Nitrate/Nitrite (NOx) are suggested for inclusion in this permit. Monitoring from weekly Total Kjeldahl Nitrogen (TKN) should coincide with monthly NOx monitoring to calculate monthly TN. No limits are proposed for the draft permit.

TN is a calculated value based on the sum of NOx and TKN, and, shall be reported as pounds, calculated as:

Average TN (mg/L) x Total Daily Flow (MGD) x 8.34 = Pounds TN/day
where, TN (mg/L) = TKN (mg/L) + NOx (mg/L)

Per EPA excess nitrogen (N) and phosphorus (P) are the leading cause of water quality degradation in the United States. Historically nutrient management focused on limiting a single nutrient—phosphorus or nitrogen—based on assumptions that production is usually phosphorus limited in freshwater and nitrogen limited in marine waters. Scientific research demonstrates this is an overly simplistic model. The evidence clearly indicates management of both phosphorus and nitrogen is necessary to protect water quality. The literature shows that aquatic flora and

fauna have differing nutrient needs, some are P dependent, others N dependent and others are co-dependent on these two nutrients.

Like P, N promotes noxious aquatic plant and algal growth. High concentrations of P and N together cause greater growth of algae than P alone. The relative abundance of these nutrients also influences the type of species within the community. Furthermore, a high N-to-P ratio may exacerbate the growth of cyanobacteria, while elevated levels of nitrogen increase toxicity in some cyanobacteria species. Given the dynamic nature of all aquatic ecosystems, for the State to fully understand the degradation to water quality it is necessary to limit P and monitor bioavailable N (including nitrate, ammonium, and certain dissolved organic nitrogen compounds).

The range and average concentrations of Total Nitrogen in the Winooski WWTF discharge from 5/31/2015 to 3/31/2020 are presented in Table 1 and the mass balance of Total Nitrogen around the facility is presented in Table 6 above. The calculated change in the instream Total Nitrogen concentration attributable to the Winooski WWTF effluent is 169 ug/L.

Total Phosphorus:
The potential impacts of phosphorus discharges from this facility to the receiving water have been assessed in relation to the narrative criteria in §29A-302(2)(A) of the 2017 VWQS, which states:

In all waters, total phosphorous loadings shall be limited so that they will not contribute to the acceleration of eutrophication or the stimulation of the growth of aquatic biota in a manner that prevents the full support of uses.

To interpret this standard, the Secretary relies on a framework which examines TP concentrations in relation to existing numeric phosphorus criteria and response criteria in §29A-306(a)(3)(c) of the VWQS, for streams that can be assessed using macroinvertebrate biocriteria. Under this framework, a positive finding of compliance with the narrative standard can be made when nutrient criteria are attained, or when specific nutrient response variables: pH, Turbidity, Dissolved Oxygen, and aquatic life use, all display compliance with their respective criteria in the Water Quality Standards.

However, as the receiving water is non-wadeable and thus not amenable to assessment using the VTDEC biocriteria for macroinvertebrates, the standard assessment framework should not be used, and with respect to phosphorus discharge, this determination relies instead on calculated instream concentrations.

Total Phosphorus Numeric Analysis*:*
The TP concentrations in the Winooski River are less than the 2017 nutrient criteria threshold of 27 ug/L Total Phosphorus in a Class B Warm Water, Medium Gradient stream. The calculated change in the in-stream TP concentration attributable to the Winooski WWTF is 4.15 (ug/L) shown in Table 6. This would reflect a minor increase, with limited to no expected impact on the parameters listed in Table 8.

Total Phosphorus Nutrient Response Conditions Analysis:
The Combined Nutrient Response Conditions for Aquatic Biota and Wildlife in Rivers and Streams at RM 9.0 on 8/19/2010 and 9/3/2010 meets VWQS for pH, meets VWQS for Turbidity , meets VWQS for Dissolved Oxygen and as shown below in Table 8. Therefore, the narrative standard presented in §3-01.B.2 of the VWQS complies with the VQWS for Total Phosphorus but may still be subject to limits proscribed by VSA 1266a or a Phosphorus TMDL.

Table 8. Assessment of Phosphorus Response Variables around the Winooski WWTF

Response variable (VWQS reference)	Target Value	River-mile: 9.3 (Upstream) 8/19/2010	River-mile: 9 (Downstream) 8/19/2010
pH (§3-01.B.9)	6.5-8.5 s.u.	*8.15*	*8.16*
Turbidity (§3-04.B.1)	< 25 NTU at low mean annual flow	*1.74*	*1.47*
Dissolved Oxygen (min) (§3-04.B.2)	>5 mg/L and 60% saturation	*8.04*	*9.21*
Aquatic biota based on macroinvertebrates.	Attaining an assessment of good, or better.	*NA*	*NA*

Total Phosphorus Reasonable Potential Determination:
The numeric criteria for TP were not exceeded when calculated at this facility's full design flow and under LMM conditions within the receiving water. This facility does not have reasonable potential to violate VWQS.

This facility is subject to the 2016 Lake Champlain Phosphorus TMDL. That document reduces the facility's Annual Waste Load Allocation from 1.160 mt/year or 2557 lbs/year, to 0.387 mt/year or 853 lbs/year. The existing permit includes a 0.8 mg/L monthly average permit limit for TP, per 10 VSA 1266(a), and is not proposed to change. This mass and concentration limit must be included in the draft permit.

Summary of Reasonable Potential Determinations
Review of previous TRC permit limit indicated the limit was not protective of VWQS at the critical 7Q10 flow. WQBELs were calculated and are proposed for the permit. Methods for how the WQBELs were calculated are best described in the attached "*WQBEL Permit Limit Review and Calculations for the Winooski WWTF Facility (3-1254)*".

Recommended Biological and Water Quality Monitoring:
The stream complies with VWQS for all other identified response variables, and therefore the narrative standard presented in §29A-302(2)(A) of the VWQS is not fully supported (as shown in Table 7). It is not necessary to include biomonitoring in the draft permit, as the receiving water has been deemed non-wadeable and instream biomonitoring is not applicable for this facility. Receiving water monitoring may be required in the event sampling methods and analyses improve.

Recommended Effluent Monitoring:
In addition to the monitoring required in the current permit, the following monitoring is suggested for inclusion in the renewed permit to provide additional data to support future Reasonable Potential Determinations:

- It is recommended that four 2-species (*Ceriodaphnia dubia* and *Pimephales promelas)* 48-hour acute and 96-hour chronic tests be included in the draft permit, two during the summer (August/October) and two during the winter (January/February). It is also suggested that concurrent sampling and analysis for Total Kjeldahl Nitrogen, TRC, and priority pollutants be conducted with each of these tests.

- Continued TKN monitoring is recommended in lieu of additional TAN monitoring for the permit. The current permit requires weekly TKN monitoring as a "monitor only" condition, and not proposed to change. Monitoring Schedules shall coincide with proposed Total Nitrogen monitoring requirements.

- A new daily maximum limit for 0.9 mg/L-TRC and monthly average limit for 0.5 mg/L-TRC is proposed for the draft permit. Monitoring frequency for TRC should remain daily.

- Both Total Cu and Zn shall continue to be monitored to assess the assimilation capacity of metals in the Lower Winooski River. A monthly sampling frequency is proposed for daily maximum mass quantity and concentration, for Total Copper and Zinc, in the draft permit.

- Total Phosphorus should continue to be sampled weekly to ensure compliance with the existing Monthly Average Total Phosphorus limit of 0.8 mg/l and new Annual Waste Load Allocation of 0.387 mt/year or 853 lbs/year as proposed in the LC TMDL.

Conclusion:
After review of all available information, it has been determined that there is reasonable potential for the discharge of TRC to cause or contribute to a water quality violation, and as such, the revision of existing WQBELs were determined to be necessary and included in this report. Otherwise, this discharge does not appear to cause, have a reasonable potential to cause, or contribute to an instream toxic impact or instream excursion above the water quality criteria.

Agency of Natural Resources
Department of Environmental Conservation
Watershed Management Division
1 National Life Drive Davis 3
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MEMORANDUM

Prepared by: Jamie Bates, Wastewater Program (WWP)

Cc: Amy Polaczyk, Manager, WWP
Bethany Sargent, Manager, Monitoring and Assessment Program (MAP)
Rick Levey, MAP

Date: April 1, 2021

Subject: WQBEL Permit Limit Review and Calculations for the Winooski WWTF Facility (3-1254)

I. Introduction

This memo serves as a record of the review and calculation of Water Quality Based Effluent Limits (WQBEL) and is intended to supplement the Reasonable Potential Determination memo prepared for the subject facility. The memo is broken into the following parts:

- An introduction
- A description of new or revised permit limit requirements.
- A description of the methodology used to develop WQBEL permit limits
- Narrative justifications for any new permit limits

The spreadsheet used to perform these calculations is available upon request.

II. New Permit Limits

	WQBEL Discharge Limitations									
	Annual Average	Annual Limit	Monthly Average	Weekly Average	Maximum Day	Monthly Average	Weekly Average	Maximum Day	Instantaneous Maximum	Sampling Frequency
Effluent Characteristics (Constituents)		lbs/year	Mass (lbs/day)			Concentration (mg/L)				(per month)
Total Residual Chlorine (TRC)						0.5		0.9		Daily (30)
Total Phosphorus		853				0.8				Weekly (4)

The constituents shown above in Table 1 were developed in order to ensure that the proposed discharge is protective of Vermont Water Quality Standards (VWQS) in the receiving water.

The following constituents were not analyzed as WQBELs: Flow, Ultimate Oxygen Demand, BOD, TSS, Settleable Solids, TKN, TN, E. coli, Total Copper, Total Zinc, and pH. These constituents are either subject to TBELs or the data and analytical capacity to model as WQBELs is unavailable.

III. WQBEL calculation methodology

The Water-Quality Based Effluent Limitations (WQBELs) for pollutants of concern were assessed via the mass balance steady state model method outlined in the Chapter 4 of the EPA's Technical Support Document for Water Quality-Based Toxics Control (TSD) (page 86). Results were then compared to the current permit limit. The recommended permit limit was selected by comparing applicable Technology-Based Effluent Limits (TBELs), current WQBELs, and WQBELs calculated based on 2017 VWQS acute and chronic criteria.

The steady-state mass balance method produces a Waste Load Allocation (WLA), the critical effluent pollutant concentration based on the VWQS acute and chronic critical thresholds for the constituent(s) of concern. The method assumes complete mixing of the pollutant within the receiving water. The resulting WLA is the WQBEL for each acute and chronic VWQS criteria dilution assessed.

Per the TSD method, WLA results were used to calculate the Long-Term Average (LTA) for each criteria type using methods provided in Table 5-1 (TSD page 102). WLA multipliers are picked from the 99th percentile column. The most conservative LTA is then used to determine the Maximum Daily Limit (MDL) or Average Monthly Limit (AML) using the calculation shown in Table 5-2 (TSD page 103). The 99th percentile column is used for the MDL calculation and the 95th percentile columns are used for the AML calculation.

In this process data for the facility and receiving waters is used. When necessary values for VWQS were calculated based upon the methods described in their appendices and footnotes. Monitoring frequency are taken from the existing permit or assigned for new pollutants based upon similar facilities. In the absence of ambient receiving water data, a value of 5% of the VWQS has been generally assumed for the upstream concentration. Please see the individual calculation tabs in the calculation spreadsheet for specific analyses.

The resulting MDL and AML are compared with the existing permit limits, any applicable TBELs including TMDLs, and any legislated limits to determine the final effluent limits that are protective of quality standards. The proposed limits are entered into the spreadsheet and Table 1 (above) and a short narrative is prepared justifying the limits. Those narratives are presented in the next section.

IV. Justification of Proposed WQBELs

1. Total Residual Chlorine (TRC)

The existing Instantaneous Maximum and Weekly Average limits of 1.48 mg/L and 0.86 mg/L were assessed to find whether they support the 2017 VWQS acute (0.019 mg/L) and chronic (0.011 mg/L) criteria, protective of aquatic biota. New limits were calculated using the TSD Method and were based on the 2017 VWQS acute and chronic criteria. The TSD Method calculates daily maximum and monthly average limits. The existing instantaneous maximum limit was found to be less protective of water quality than the newly calculated daily maximum. The new limits calculated for daily maximum and monthly average should be included in the permit. These values are already analyzed and will not result in additional laboratory costs.

2. Total Phosphorus

This facility has been assigned an Annual Limit of 853 lbs of Total Phosphorus in the Lake Champlain Phosphorus TMDL. This facility is subject to 10 VSA 1266a which limits the discharge of Total Phosphorus to a Monthly Average of 0.80 mg/L and remains unchanged from the existing permit. These limits should be included in the permit.

RESPONSIVENESS SUMMARY
for
NPDES Discharge Permit 3-1248
City of Winooski

The Vermont Agency of Natural Resources (Agency) placed the above referenced permit on public notice for comment from **April 7, 2021** through **May 7, 2021**. This is a renewal permit.

Comments on the Draft Permit were received during the public notice period. The following is a summary of the comments and the Agency's responses to those comments. Similar comments were grouped together. A copy of any or all comments received may be obtained by contacting the Agency's Watershed Management Division at (802)-828-1535.

COMMENT 1.
1.A) Permit Conditions chart, We would ask to have the Effluent Chlorine limits relaxed or perhaps a seasonal variation limitation could be considered. Currently the weekly average limit is 0.86 mg/L and daily maximum of 1.48 mg/L. The proposed limits of 0.5 mg/L and 0.9 mg/L respectively do not allow for any operational fluctuations and acutely limit our disinfection window for e.Coli kill. We strongly request consideration of at least a 0.6-0.7 mg/L monthly average. We feel we can operate at or below the proposed 0.9 mg/L max.
The facility at this time does not utilize dechlorination, but has relied upon balancing optimum disinfection levels and meeting the e.Coli limits. We feel it will take more time to evaluate chemical feed optimization than the June 1, 2021 deadline given in this Draft Permit, therefore request additional time with regards to this permit limit if no changes are made to the proposed limits.

RESPONSE 1.
Based on the Reasonable Potential Determination attached to the Fact Sheet, the Technical Support Document (TSD) method used suggests the facility shall have a Total Residual Chlorine (TRC) monthly average limit of 0.5 mg/L to meet the Vermont Water Quality Standards (VWQS). Changing the limit to anything above the 0.5 mg/L would effectively permit the facility to violate the VWQS. For this reason, the limit is unchanged from the Final Permit.

The Agency has included compliance schedule "beginning" and "end" dates in Condition I.A.1. per VWQS § 29A-106(c) to afford the Permittee adequate time to comply with the more stringent permit requirements for TRC that are based on the current VWQS. The schedule requires the facility to achieve compliance with the TRC limits by 12/1/2024, and to provide the Agency with compliance progress updates every 9 months. This compliance date is roughly one year after the 20-year facility evaluation is due and is designed to allow the facility to work with a professional engineer to address the TRC compliance challenges during the evaluation process.

COMMENT 2.
D.3) pg 6-7 Copper Assessment – Industrial Waste Survey requirements are onerous. Identifying potential users within the collection system is much different than quantifying copper contribution from these users, which is essentially what these conditions require of staff. Flow monitoring and sampling at industrial discharge manholes is a big task, in order to quantify a pollutant that frankly shows no existence in historical data at the WWTP outfall. We strongly believe further testing will prove this point and urge DEC to remove the survey requirement, at least for this permit cycle. If facility copper data indicates there is an issue, then implement the survey in the next permit cycle.

RESPONSE 2.
The Agency reviewed the Copper Assessment language in the Draft Permit and partially agrees with this comment. This condition is intended to generate a list of facilities or industrial users tied into the facility's collection system who have the potential to discharge copper. This list would be for tracking purposes only. The Agency did not intend for the Permittee to quantify the copper contribution from each facility at this time. Flow monitoring and sampling of the industrial discharge may be the course taken in the event the WWTF is seeing high concentrations of copper in the effluent and is searching for the source, and this list of potential sources would act as a guide to narrow down where copper source reduction may be necessary.

The Agency revised the language in Condition I.D of the Final Permit to clarify the intent of the condition and what is required of the Permittee. This condition received similar public comments for other Lower Winooski permits recently on public notice, and to ensure consistency, all comments received were considered in the language of this condition in the Final Permit. Condition I.D.3 now specifies "Significant Industrial Users, waste haulers, and root treatment specialists with the potential to introduce copper to the collection system." The Agency believes that by limiting the universe of facilities to consider in the survey the requirement less onerous to comply with. Therefore, this condition remains in the Final Permit. The final Fact Sheet language was also updated to reflect changes made to the Final Permit to describe in more detail what is expected from the Permittee to complete the Industrial Waste Survey.

In place of a more comprehensive collection system survey, the Draft and Final Permit specify effluent copper testing methods shall have a method detection limit of at least 0.006 mg/L. The previous testing method used had a method detection limit of 0.02 mg/L, which is nearly 4 times the stricter method detection limit. Past monitoring has been reported to the Agency as below detection limit (i.e. <0.02 mg/L) on submitted WR-43s. Using a test method with a lower detection limit will help the Agency understand whether copper is a concern in the Lower Winooski as described in Condition I.D of the Draft and Final Permit and Part V.D.1 of the Draft and final Fact Sheet.

To clarify, the Lower Winooski River is not currently subject to Total Copper impairments requiring a Total Maximum Daily Load (TMDL), the required regulatory method for Total Phosphorus under the Lake Champlain TMDL. The plan proposed in the Draft and Final Permit is the Wastewater Management Program's precautionary approach for reducing the potential need for a Total Copper TMDL in the Lower Winooski in the future.

COMMENT 3.
E & F) pg 8-9 We would ask that the submission dates for the Emergency Power Plan and OMERP align to both being due by 10/28/21 (180 days from permit effective date).
In the current Draft we are not sure what dates are imposed (actual due dates or 180 days from end of comment period)?

RESPONSE 3.
The Agency incorporated the recommended changes into the Final Permit. The comment is correct that the date provided in the Draft Permit was a Drafting error as it does not reflect 180 days after the permit effective date as it should. This date has been changed to 1/28/2022 as this is 180 days from August 1, 2021, in the Final Permit.

COMMENT 4.
G) pg 9 If the permit cycle starts in June how will the 12-month running total annual pounds coincide with the annual permitted pounds?
Pg 10 speaks to the Phosphorus Optimization Plan. Are we required to start optimization after the POP due date (8/29/21) or does the one year evaluation start at the permit effective date?

RESPONSE 4.
The 12-month running total annual pounds should account for values reported before August 2021 for Total Phosphorus (TP). The 12-month running total does not begin at the permit effective date in the Final Permit but is reported at the end of the calendar year on the December discharge monitoring report due January 15, 2022. Therefore, the report running total annual pounds would account for results observed from January 1, 2021, to December 31, 2021. The renewed Permit provides a 12-month optimization period where the WWTF will not be subject to the TP permit limit.

Similar to Comment and Response 3, the comment is correct that the date provided in the Draft Permit was an error and it does not provide sufficient time for the Permittee to develop, submit, and implement the Phosphorus Optimization Plan (POP). Further, the Agency is aware that the Winooski WWTF is working with Hoyle Tanner & Associates under a Lake Champlain Basin Program -funded effort to develop a detailed POP that will serve as a case study for other communities. The Final Permit now provides a POP due date by September 30, 2022, and an implementation date for November 29, 2022 (60 days after POP submittal). The first annual POP report due date was changed to January 31, 2023.

COMMENT 5.
Section K pg 13 requires a 20-year Engineering Evaluation Study by 12/22 on WWTP and Collection System but the Fact Sheet appears to require just the WWTP evaluation and states the last evaluation study

was done in 1972, which is not accurate. FA/A completed the last 20-year facility evaluation, CSO assessment and infiltration and inflow analysis in 1996.

RESPONSE 5.
The Agency has incorporated the recommended changes to the Final Fact Sheet Part VI.I in addition to changing the timeline of upgrades to exclude facility component upgrade and refurbishment projects that had occurred in the past 7-years. This change was driven by the Agency's acknowledgement of an oversight, that the current permit effective date was in 2004, therefore any project completed before 2014 should be considered for the next 20-year evaluation.

COMMENT 6.
II General Conditions B.3) pg 18 Duty to Mitigate paragraph is confusing. (minimize or prevent any discharge or sludge use or disposal…….) and what exactly does human health imply?

RESPONSE 6.
Condition II.B.3. Duty to Mitigate speaks to the Permittee's obligation to treat and dispose of wastewater and sludge from the treatment system properly and to mitigate—or minimize—the human health and environmental impacts of any violation. Note that the first sentence of this general condition, including reference to human health, is drawn directly from the required "conditions applicable to all permits" set forth in 40 C.F.R. § 122.41(d).

COMMENT 7.
11 General Conditions C.6) pg 26 Monitoring Requirements – Monthly Reporting…..there are significant additions to WR43-4 reporting. Does DEC have a template containing all these new monitoring parameters?

RESPONSE 7.
WR-43-4 forms are typically used for aerated lagoon facilities and the Winooski WWTF is designated as a large, activated sludge facility equipped with SBRs. The WR-43 forms applicable to this facility are 2, 3, 8, and 9 as specified on the Agency's Wastewater Monitoring Report Forms and Guidance webpage: https://dec.vermont.gov/watershed/wastewater/wastewater-monitoring-report-forms-and-guidance.
The correct forms for this facility type shall be used for future reporting. WR-43-TN and WR-43-TP reporting forms shall also be used when the permit is effective.

These forms are downloadable in Microsoft Excel spreadsheet format and can be edited for the downloader's use. How the Permittee would like to organize the forms or attachments is up to their discretion. The Permittee may download and edit the forms to include fields for the new monitoring parameters. If the Permittee edits the forms, they must send the form to Mari Cato, within the Business Operations Specialist Section (BOSS) Program, for approval via email to Mari.Cato@vermont.gov. She can also be reached by phone: (802)-490-6105.

All new parameters included in the Final Permit will be new fields added to Discharge Monitoring Report form submitted via ANR Online.

FACT SHEET COMMENTS:

COMMENT 7.
(pg 8 of 36) Nitrate and nitrite total 1 Det…….? What does this mean?

RESPONSE 7.
The "Nitrite Plus Nitrate Total 1 Det." annotation is equivalent to nitrate/nitrite and is how this constituent is recognized in the Wastewater Inventory (WWInv), the Wastewater Program's system database. The Wastewater Management Program has recently developed an internal procedure that saves and exports permit language from the WWInv. This change supports consistency for language used in the permit documents and the information flowed to the Environmental Protection Agency (EPA) in accordance with 40 C.F.R. Part 127, the Electronic Reporting Rule.

The Agency has revised the Fact Sheet Part V.C.1 to clarify the meaning of Nitrite Plus Nitrate Total 1 Det.

COMMENT 8.
(pg 16 of 36) date of last engineering evaluation was 1972 (change to 1996)

RESPNSE 8.
See Response 5. The recommended changes have been made to the Fact Sheet.

COMMENT 9.
Pg 3 of the memorandum (reasonable potential determination for the WWTP) has errors.

Annual Flow Max seems low at 1.13
pH Min is a typo as our daily and monthly report for that month/year both show 6.85 reported
TRC Avg of 0.94 very unlikely for an annual average

RESPONSE 9.
The Agency reviewed the reasonable potential determination (RPD) "Table 1. Effluent Data for the Winooski WWTF from 5/31/2015 to 3/31/2020". This data is based on the data generated from a report through the WWInv, the data generated is pulled from past DMR submissions via ANR Online. From this report:

1.13 MGD was the maximum observed value for annual average flow monitoring requirements from DMRs submitted between 5/31/2015 and 5/31/2020. The RPD Parameter listed in the RPD Memorandum attached to the Final Fact Sheet has been revised to say, "Annual Average Flow (MGD)".

6.4 s.u. was the minimum observed value for pH DMRs submitted between 5/31/2015 and 5/31/2020 on ANR Online. However, the Agency looked back on the scanned WR-43s for November of 2015 and found 6.85 s.u. was reported for 11/30/2015. This change has been made to the RPD Memorandum attached to the Final Fact Sheet.

0.94 mg/L was the calculated average observed instantaneous maximum values reported for Total Residual Chlorine from DMRs submitted between 5/31/2015 and 5/31/2020. There was no mention that the values represented were annual averages in the report. No changes specific to Total Residual Chlorine were made in the RPD Memorandum.

Agency of Natural Resources
Department of Environmental Conservation
Watershed Management Division
One National Life Drive, Davis Building, 3rd Floor
Montpelier, VT 05620-3522

Permittee:	
NPDES Permit No.	
Preparer/Contact:	
Telephone:	
Email:	
Month/Year:	

THIS FORM IS TO BE SUBMITTED EACH MONTH ALONG WITH THE eDMR FORM.

TN shall be reported as total daily pounds calculated as:
TN (lbs) = monthly average TN (mg/L) x total daily flow (MG) x 8.34 (lbs/gallon)
where TN (mg/L) = TKN (mg/L) + NOx (mg/L)

Table 1. Current Month Influent Monitoring Results

A	B	C	D
Date of Sample	TKN (mg/l) (measured)	NO_x (mg/) (measured)	TN (mg/L) (=B+C)
Maximum			

Table 2. Current Month Effluent Monitoring Results

A	B	C	D	E	F
Date of Sample	TKN (mg/l) (measured)	NO_x (mg/) (measured)	TN (mg/L) (=B+C)	Volume discharged on date of sample (MG) (measured)	TN (lbs/day) (=D x E x 8.34)
Maximum					
Average					

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Permittee:	
NPDES Permit No.	
Preparer/Contact:	
Telephone:	
Email:	
Year:	

THIS TABLE IS TO BE SUBMITTED ANNUALLY BY JANUARY 15 ALONG WITH THE DECEMBER eDMR FORM.

Table 3. Current Year Annual Average Effluent TN (lbs/day).

Calculate the annual average TN by adding the calculated TN (lbs/day) values collected during the calendar year and dividing by the number of times sampled.

A	B
Date of Sample	(lbs/day)

A	B
Date of Sample	(lbs/day)

Current Calendar Year Annual Average Effluent TN (lbs/day):

Previous Calendar Year Annual Average Effluent TN (lbs/day):

Summary of nitrogen removal optimization efforts and efficiencies achieved over the current calendar year:

Agency of Natural Resources
Department of Environmental Conservation
Watershed Management Division
1 National Life Drive,Davis 3
Montpelier, VT 05620-3522

Permittee:	
NPDES Permit No.	
Preparer/Contact:	
Telephone:	
Email:	
Month/Year:	

Total Phosphorus Waste Load Allocation from Lake Champlain Phosphorus TMDL:		metric tons/year lbs/year	Select your facility in the pulldown list next to Permittee above.
Monthly Average TP concentration		mg/L	Enter this value from WR-43.
Monthly Average Daily Flow Rate		MGD	Enter this value from WR-43.
Number of days with discharge		days	Enter the number of days with discharge.
Average TP Concentration * Average Flow Rate * Days of Discharge * 8.34	0.00	lbs	Pounds of Phosphorus discharged this month.
12 Month Running Total Pounds of Phosphorus		lbs/year	Enter the 12 Month Running Total Pounds of Phosphorus.
12 Month Running Total / Waste Load Allocation * 100		%	Percentage of Annual Phosphorus Load from TMDL

This form should be submitted monthly by facilities that have a Total Phosphorus Waste Load Allocation under the Lake Champlain Phosphorus TMDL. If you have a permit issued before 2017 DO NOT USE this form.

Notes:

Table 9. Vermont Individual WWTF Phosphorus Wasteload Allocations
(*Facilities with allocations different from the 2002 TMDLs are shown in italics.*)

Facility	Lake Segment	Design Flow (mgd)	Current Permit Load (mt/yr)	TMDL Wasteload Allocation (mt/yr)	Change in Permitted Load (mt/yr)
Alburgh	13 Isle LaMotte	0.130	0.108	0.108	0.000
Barre City	*05 Main Lake*	4.000	3.314	1.105	-2.209
Barton				0.246	
Benson	01 South Lake B	0.018	0.122	0.122	0.000
Brandon	04 Otter Creek	0.700	0.580	0.580	0.000
Brighton				0.695	
Burlington Electric McNeil Generating Station	05 Main Lake	0.365	0.017	0.017	0.000
Burlington Main	*07 Burlingto n Bay*	5.300	4.392	1.464	-2.928
Burlington North	*05 Main Lake*	2.000	1.657	0.552	-1.105
Burlington River (East)	*05 Main Lake*	1.200	0.994	0.331	-0.663
Cabot	05 Main Lake	0.050	0.041	0.041	0.000
Castleton	01 South Lake B	0.480	0.397	0.397	0.000
Enosburg Falls	*12 Missisquo i Bay*	0.450	0.373	0.124	-0.249
Essex Junction	*05 Main Lake*	3.300	2.569	0.911	-1.658
Fair Haven	01 South Lake B	0.500	0.414	0.414	0.000
Fairfax	09 Malletts Bay	0.078	0.539	0.539	0.000
Global Foundries (I B M Corp)	*05 Main Lake*	8.000	5.531	2.210	-3.321

Hardwick	09 Malletts Bay	0.371	0.410	0.410	0.000
Hinesburg	*06 Shelburne Bay*	*0.250*	*0.276*	*0.069*	*-0.207*
Jeffersonville	09 Malletts Bay	0.077	0.532	0.532	0.000
Johnson	09 Malletts Bay	0.270	0.224	0.224	0.000
Marshfield	05 Main Lake	0.045	0.311	0.311	0.000
Middlebury	04 Otter Creek	2.200	1.823	1.823	0.000
Milton	09 Malletts Bay	1.000	0.829	0.829	0.000
Montpelier	*05 Main Lake*	3.970	3.290	1.097	-2.193
Morrisville	09 Malletts Bay	0.550	0.352	0.352	0.000
Newport City				0.964	
Newport Town (Newport Center)	*12 Missisquoi Bay*	0.042	0.006	0.116	0.110
North Troy	*12 Missisquoi Bay*	0.110	0.760	0.122	-0.638
Northfield	*05 Main Lake*	1.000	0.829	0.276	-0.553
Orleans				0.176	
Orwell	02 South Lake A	0.033	0.228	0.228	0.000
Otter Valley Union High School	04 Otter Creek	0.025	0.173	0.173	0.000
P B M Nutritionals Inc	09 Malletts Bay	0.425	0.352	0.352	0.000
Pawlet (West Pawlet)	01 South Lake B	0.040	0.276	0.276	0.000
Pittsford	04 Otter Creek	0.085	0.483	0.483	0.000

Pittsford Fish Hatchery (US Dept of Interior-DEisenhower NFH)	04 Otter Creek	2.600	0.691	0.691	0.000
Plainfield	*05 Main Lake*	0.125	0.691	0.138	-0.553
Poultney	01 South Lake B	0.500	0.414	0.414	0.000
Proctor	04 Otter Creek	0.325	0.359	0.359	0.000
Richford	*12 Missisquoi Bay*	0.380	0.420	0.105	-0.315
Richmond	*05 Main Lake*	0.222	0.184	0.061	-0.123
Rutland City	04 Otter Creek	8.100	5.634	5.634	0.000
Shelburne #1 (Crown Road)	*06 Shelburne Bay*	0.440	0.348	0.122	-0.226
Shelburne #2 (Harbor Road)	*06 Shelburne Bay*	0.660	0.497	0.182	-0.315
Sheldon Springs	12 Missisquoi Bay	0.054	0.373	0.373	0.000
Shoreham	04 Otter Creek	0.035	0.242	0.242	0.000
South Burlington Airport Parkway	*05 Main Lake*	3.300	1.906	0.911	-0.995
South Burlington Bartlett Bay	*06 Shelburne Bay*	1.250	0.878	0.345	-0.533
St Albans Northwest Correctional	11 St. Albans Bay	0.040	0.028	0.028	0.000
St. Albans City	*11 St. Albans Bay*	4.000	2.762	1.105	-1.657
Stowe	*05 Main Lake*	1.000	0.282	0.276	-0.006
Swanton	*12 Missisquoi Bay*	0.900	0.746	0.249	-0.497
Troy/Jay	*12 Missisquoi Bay*	0.800	0.221	0.221	0.000

Vergennes	04 Otter Creek	0.750	0.621	0.621	0.000
VT Fish & Wildlife - Ed Weed Fish Culture Station	05 Main Lake	11.500	0.914	0.914	0.000
VT Fish & Wildlife - Salisbury Fish Hatchery	04 Otter Creek	1.310	0.181	0.181	0.000
Wallingford FD 1	04 Otter Creek	0.120	0.829	0.829	0.000
Waterbury	*05 Main Lake*	0.510	0.563	0.141	-0.422
West Rutland	04 Otter Creek	0.450	0.364	0.364	0.000
WestRock Converting (Rock Tenn)	*12 Missisquoi Bay*	2.500	1.260	0.691	-0.569
Williamstown	*05 Main Lake*	0.150	1.036	0.166	-0.870
Winooski	*05 Main Lake*	1.400	1.160	0.387	-0.773
Total			55.802	32.336	-23.465

The yellow column contains the P loads for each facility in mt/year (metric ton per year).

Alburgh	3-1180
Barre City	3-1272 3-1202
Benson	3-1166
Brandon	3-1196 3-1213
Burlington Electric McNeil Generating Station	3-1219
Burlington Main	3-1331
Burlington North	3-1245
Burlington River	3-1247
Cabot	3-1440
Castleton	3-1238
Enosburg Falls	3-1234
Essex Junction	3-1254
Fair Haven	3-1307
Fairfax	3-1194
I B M Corp	3-1295

Hardwick	3-1143
Hinesburg	3-1172
Jeffersonville	3-1323
Johnson	3-1149
Marshfield	3-1195
Middlebury	3-1210
Milton	3-1203
Montpelier	3-1207
Morrisville	3-1155 3-1241
Newport Town	3-1236
North Troy	3-1139
Northfield	3-1158 3-1201
Orwell	3-1214
Otter Valley Union High School	3-0293
P B M Nutritionals Inc	3-1209
Pawlet	3-1220
Pittsford	3-1189

US Dept of Interior-DEisenhower NFH	3-1188
Plainfield	3-0381
Poultney	3-1231
Proctor	3-1298
Richford	3-1147
Richmond	3-1173
Rutland	3-1285
Shelburne 1 (Crown Rd)	3-1289
Shelburne 2 (Harbor Rd)	3-1304
Sheldon Springs	3-1108
Shoreham	3-1459
South Burlington - Airport Parkway	3-1278
South Burlington - Bartlett Bay	3-1284
St Albans Northwest Correctional	3-1260
St Albans City	3-1279
Stowe	3-1232
Swanton	3-1292
Troy & Jay	3-1311

Vergennes	3-0368
VT Fish & Wildlife - Ed Weed Fish Culture Station	3-1312
VT Fish & Wildlife - Salisbury Fish Hatchery	3-0361
Wallingford FD 1	3-0365
Waterbury	3-1160
West Rutland	3-1237
WestRock Converting Company	3-1118
Williamstown	3-1176
Winooski	3-1248