

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

**FACT SHEET FOR DRAFT PERMIT**  
**May 2021**

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO  
DISCHARGE TO WATERS OF THE STATE**

**PERMIT NO:** 3-1128  
**PIN:** NS94-0008  
**NPDES NO:** VT0000108

**NAME AND ADDRESS OF APPLICANT:**

Soundview Vermont Holdings, LLC  
PO Box 226  
Putney, VT 05346

**NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:**

Soundview Vermont Holdings, LLC  
Main Street  
Putney, VT 05346

**FACILITY COORDINATES:** Lat: 42.97571 Long: -72.52090

**RECEIVING WATER:** Connecticut River

**CLASSIFICATION:** All uses Class B(2) 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.

**I. Proposed Action, Type of Facility, and Discharge Location**

The Secretary of the Vermont Agency of Natural Resources (hereinafter referred to as "the Secretary") received a renewal application for the permit to discharge into the designated receiving water from the above-named applicant on July 3, 2017. The facility's previous permit was issued on February 22, 2013. The previous permit (hereinafter referred to as 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 Section 13.5(b). At this time, the Secretary has made a tentative decision to reissue the discharge permit.

The facility is engaged in the treatment of treated process wastewater from paper manufacturing and is classified as a Grade IV Industrial Paper, Non-Major NPDES Wastewater Treatment Facility (WWTF).

A Reasonable Potential Determination for the facility is provided in Attachment A.

## **II. Description of Discharge**

Soundview Vermont Holdings, LLC operates a paper mill that produces products such as napkins, toilet paper, tissue, and paper towels from a 100% secondary wastepaper de-ink process. The process wastewater treatment facility is an extended aeration treatment plant that consists of a Dissolved Air Flotation (DAF) unit, two aeration tanks, and two clarifiers.

The design flow of the WWTF is 0.275 MGD and the average flow from the facility over the last 5 years is approximately 0.133 MGD.

The WWTF maintains a constant discharge to the Connecticut River.

## **III. Limitations and Conditions**

The draft permit contains limitations for effluent flow, Biochemical Oxygen Demand (BOD<sub>5</sub>), Turbidity, Total Suspended Solids (TSS), and pH. It also contains monitoring requirements for Total Phosphorus (TP), Total Nitrogen (TN), Total Kjeldahl Nitrogen (TKN), and Nitrate/Nitrite (NO<sub>x</sub>). The effluent limitations of the draft permit and the monitoring requirements may be found on the following pages of the draft permit:

Effluent Limitations:	Page 2 of 21
Monitoring Requirements:	Pages 2-3 of 21

## **IV. Statutory and Regulatory Authority**

### **A. Clean Water Act and NPDES Background**

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 BOD<sub>5</sub>, 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. The applicable water quality standards for this permit are the 2017 Vermont Water Quality Standards (Environmental Protection Rule, Chapter 29a).

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 in-stream 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).

### **1. Reasonable Potential Determination**

In determining whether this permit has the reasonable potential to cause or contribute to an impairment, Vermont 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, 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.

A Reasonable Potential Determination Memo for the facility is provided in 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.

## **V. Description of Receiving Water**

The receiving water for this discharge is the Connecticut River, a designated Cold-Water Fish Habitat. At the point of discharge, the river has a contributing drainage area of 5,724 square miles. The 7Q10 flow of the river is estimated to be 818 cubic feet per second (CFS) and the Low Median Monthly flow is estimated to be 2,415 CFS. The instream waste concentration at the 7Q10 flow is 0.00052 (0.052%) and the instream waste concentration at the Low Median Monthly flow is 0.00018 (0.018%).

## **VI. Mixing Zone**

A Mixing Zone is a length or area within Class B waters required for the dispersion and dilution of waste discharges adequately treated to meet federal and state treatment requirements and within which it is recognized that specific water uses or water quality criteria associated with the assigned classification for such waters may not be realized. A mixing zone shall not extend more than 200 feet from the point of discharge and must meet the terms of 10 V.S.A. § 29A-204. For a mixing zone to be applicable to a discharge it must be authorized within the discharge permit.

In accordance with Section 2-04 of the Vermont Water Quality Standards, this permit establishes a mixing zone (which applies to waters within the borders of the State of Vermont) for turbidity not to exceed 200 feet from the point of discharge. Within the mixing zone, Section 29A-302(4) of the Vermont Water Quality Standards is waived, up to the turbidity discharge limit of 550 NTU. This permit also establishes a mixing zone for BOD5 not to exceed 200 feet from the point of discharge. Within the mixing zone, Section 29A-302(5) of the Vermont Water Quality Standards for Dissolved Oxygen are waived.

## **VII. Facility History and Background**

Soundview Vermont Holdings, LLC operates the Putney, Vermont mill (previously owned by Putney Paper Company), a deink tissue mill, located in Putney, Vermont. The facility is a non-integrated mill involved in the production of tissue and napkin grades from a 100% secondary wastepaper deink process. Wastepaper is stored and segregated into different grades prior to pulping with the addition of sodium hydroxide. The pulp slurry goes through various stages of washing, cleaning, and screening prior to the papermaking process. Soundview converts 80% of the tissue and napkin grades for sale as finished product.

The treatment of process wastewater consists of primary clarification followed by a two-stage high activated sludge treatment process (Zurn-Attischoltz). Sludge from the two-stage aeration/clarification system and from the primary clarifier (Poseidon DAF clarifier - new in 2009) is wasted to a belt filter press for dewatering. The company has a sludge disposal facility which is not being utilized. Sludge is hauled out of state or to an approved Vermont landfill. There is one lined holding lagoon located approximately 300 yards from the mill adjacent to Sackett's Brook. Effluent from the mill may be directed to the lagoon once per year during scheduled treatment system maintenance or during emergency situations. Typical discharge of treated wastewater to the Connecticut River is from the recycle tank following the second stage clarifier.

## **VIII. Permit Basis and Explanation of Effluent Limitation Derivation**

A. **Flow** – The draft permit maintains the monthly average flow limitation of 0.275 MGD. This facility maintains a constant discharge. Continuous flow monitoring is required.

### **B. Conventional Pollutants**

1. **Biochemical Oxygen Demand (BOD<sub>5</sub>)** – The effluent limitations of 548 lbs./day monthly average and 818 lbs./day daily max for BOD<sub>5</sub> remain unchanged from the current permit. The BOD<sub>5</sub> weekly monitoring requirement is unchanged from the current permit.
2. **Total Suspended Solids (TSS)** – The effluent limitations of 200 lbs./day monthly average and 300 lbs./day daily max for TSS remain unchanged from the current permit. The TSS weekly monitoring requirement is unchanged from the current permit.
3. **pH** – The pH limitation remains at 6.5 - 8.5 Standard Units as specified in Section 29A-303(6) in the Vermont Water Quality Standards. The pH daily monitoring requirement is unchanged from the current permit.

### **C. Non-Conventional and Toxics**

#### **1. Total Phosphorus (TP)**

The monthly “monitor only” requirement for TP remains unchanged from the current permit.

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 N, P promotes noxious aquatic plant and algal growth. High concentrations of P and N together cause greater growth of algae than N alone. The relative abundance of these nutrients also influences the type of species within the community. Given the dynamic nature of all aquatic ecosystems, for the State to fully understand the degradation to water quality it is necessary to limit or monitor for P and N (including nitrate, ammonium, and certain dissolved organic nitrogen compounds).

For more information, see:

<https://www.epa.gov/sites/production/files/documents/nandpfactsheet.pdf>

2. **Total Nitrogen (TN)** – TN is a calculated value based on Total Kjeldahl Nitrogen (TKN) and Nitrate/Nitrite (NO<sub>x</sub>) Nitrogen. The sum of TKN and NO<sub>x</sub> shall be used to derive TN and shall be calculated as:

$$\text{TN (mg/L)} \times \text{Total Daily Flow} \times 8.34$$

Where  $\text{TN (mg/L)} = \text{TKN (mg/L)} + \text{NO}_x \text{ (mg/L)}$

The monthly “monitor only” requirement remains unchanged from the current permit.

On November 10, 2011 a letter from the EPA (Region 1) to the Secretary indicted that Vermont must establish TN limitations in municipal discharge permits such that the TN load from facilities in the Connecticut River watershed is consistent with the requirements of the Long Island Sound Total Maximum Daily Load (LIS TMDL). In light of the adoption of numeric water quality criteria for TN in the LIS TMDL, the Secretary is including requirements in discharge permits to monitor for discharges of TN. For future permit reissuance, the criteria will be used to determine the potential of discharges to cause or contribute to eutrophication and/or to adversely impact the aquatic biota downstream of the discharge.

The Department reserves the right to reopen and amend this permit to include a TN limitation or additional monitoring requirements based on future monitoring data, results of nitrogen optimization, a formal Waste Load Allocation promulgated under Vermont’s Waste Load Allocation Rule, and/or the final Long Island Sound TMDL.

3. **Total Kjeldahl Nitrogen (TKN)** – TKN is the sum of nitrogen in the forms of ammonia (un-ionized ( $\text{NH}_3$ ) and ionized ( $\text{NH}_4^+$ )), soluble organic nitrogen, and particulate organic nitrogen. A monthly “monitor only” requirement has been included in the draft permit.
4. **Nitrate/Nitrite ( $\text{NO}_x$ )** – Nitrite and nitrate are oxygenated forms of nitrogen. A monthly “monitor only” requirement has been included in the draft permit.
5. **Turbidity** – The Vermont Water Quality Standards lists an effluent turbidity limit of 10 NTU. The Permittee indicated that effluent results were greater than 10 NTU and requested a mixing zone for the facility. The Permittee submitted a mixing zone analysis completed by Aquaterra in November 2005. Results indicated that the Permittee could discharge up to 630 NTU and still meet the water quality standard limit of 10 NTU at the end of the 200’ mixing zone. After the primary clarifier was replaced in 2009, the Permittee discharged at lower turbidity levels and both the Agency and the Permittee agreed upon an effluent limit of 550 NTU. The turbidity discharge limit of 550 NTU and the daily monitoring requirement remains unchanged from the current permit.
6. **Toxicity Testing** – 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 Condition I.B. 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.

**D. Special Conditions**

1. **Laboratory 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. Results shall be submitted to the Secretary by December 31, annually beginning in **2022**.
2. **Annual Outfall Reporting** – The Permittee shall develop a program to investigate and document complaints regarding the presence of excess foaming within the vicinity of outfall S/N 001. The Permittee shall correlate complaints with operational and discharge conditions at the facility and report any corrective actions taken to reduce the entrainment of air within the effluent. In addition, the Permittee should conduct visual inspections of the outfall in response to complaints and provide photo documentation of the receiving water downstream of the outfall as an attachment to the annual report. Due to topography conditions in the vicinity of the outfall, visual inspections may be conducted from the Putney Landing fishing access area. A report documenting complaints, discharge conditions, and any corrective actions taken to eliminate excess foaming in the receiving water shall be submitted to the Secretary by December 31, annually beginning in **2021**.
3. **Electronic Reporting** - The EPA recently promulgated a final rule to modernize the Clean Water Act reporting for municipalities, industries, and other facilities by converting to an electronic data reporting system. The final rule 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 non-majors, individually permitted or covered by a general permit, must do so electronically after December 2016. The Secretary has created an electronic reporting system for DMRs and has recently trained facilities in its use. As of December 2020, these NPDES facilities will also be expected to submit additional information electronically as specified in Appendix A in 40 C.F.R. part 127.
4. **Noncompliance Notification** - As required by the passage of 10 V.S.A. § 1295, promulgated in the 2016 legislative session, Condition II.D.3. 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.
5. **Reopener** - This draft permit includes a reopener whereby the Secretary reserves the right to reopen and amend the permit to implement Clean Water Act obligations or reallocation of LIS TMDL wasteload.



**E. Reasonable Potential Analysis**

The Secretary has conducted a reasonable potential analysis, which is attached to this Fact Sheet as Attachment A. Based on this analysis, the Secretary has determined the available data indicate that this discharge does not cause, have a reasonable potential to cause, or contribute to an instream toxic impact or instream excursion above the water quality criteria. As such, the development of water quality based effluent limitations (WQBELs) will not be necessary.

**IX. Procedures for Formulation of Final Decision**

The public comment period for receiving comments on this draft permit was originally scheduled from May 12, 2021 to June 14, 2021 and a public meeting was scheduled on June 3, 2021. A request to extend the public comment period and reschedule the public meeting was received on May 20, 2021. The Secretary has agreed to extend the public comment period, which has been revised to **May 12, 2021 to July 14, 2021** during which time interested persons may submit their written views on the draft permit. All written comments received by 4:30 PM on **July 14, 2021** will be retained by the Secretary and considered in the formulation of the final determination to issue, deny or modify the draft permit. The public meeting has been rescheduled to **June 29, 2021**.

Written comments should be sent to:

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

Comments may be submitted by e-mail to [ANR.WSMDWastewaterComments@vermont.gov](mailto:ANR.WSMDWastewaterComments@vermont.gov)

For additional information, contact Amy Polaczyk at 802-490-6185.

Any interested person or groups of persons may request or petition for a public meeting with respect to this draft permit. Any such request or petition for a public meeting shall be filed within the public comment period described above and shall indicate the interest of the party filing such request and the reasons why a meeting is warranted.

The Agency will hold a meeting if there is significant public interest in holding such a meeting. Any public meeting brought in response to such a request or petition will be held in the geographical area of the proposed discharge or other appropriate area, at the discretion of the Agency and may, as appropriate, consider related groups of draft permits. Any person may submit oral or written statements and data concerning the draft permit at the public meeting. The Agency may establish reasonable limits on the time allowed for oral statements and may require the submission of statements in writing. All statements, comments, and data presented at the public meeting will be retained by the Agency and considered in the formulation of the final determination to issue, deny, or modify the draft permit.

The complete application, draft permit, and other information are on file and may be inspected by appointment on the 3<sup>rd</sup> floor of the Davis Building at One National Life Drive, Montpelier, Vermont. Copies may be obtained by calling 802-828-1115 from 7:45 AM to 4:30 PM Monday

through Friday and will be made at a cost based upon the current Secretary of State Official Fee Schedule for Copying Public Records. The draft permit and fact sheet may also be viewed on the Watershed Management Division's website at:

<https://anrweb.vt.gov/DEC/IWIS/ReportViewer2.aspx?Report=WWPublicNotices&ViewParms=F>  
[alse](#)

DRAFT

**ATTACHMENT A.**  
**REASONABLE POTENTIAL DETERMINATION**

Agency of Natural Resources  
Department of Environmental Conservation  
Watershed Management Division  
1 National Life Drive 2 Main  
802-828-1535

MEMORANDUM



Prepared by: John Merrifield, Wastewater Program (WWP)

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

Date: February 5, 2021

Subject: Reasonable Potential Determination for the Soundview Paper Company WWTF

---

**I. Facility Information:**

Soundview Paper Company  
3 Water Street, Putney, VT  
Permit No. 3-1128  
NPDES No. VT0000108  
Facility Location: 42.97571, -72.5209 (NAD 83)  
Approximate Outfall Location: 42.96375, -72.51423 (WGS84)

**II. Hydrology:**

**Receiving water:** Connecticut River  
Facility Design Flow: 0.275 MGD = 0.425 CFS  
Estimated 7Q10<sup>1</sup> = 818.0 CFS  
Estimated LMM<sup>2</sup> = 2415.5 CFS  
Instream Waste Concentration at 7Q10 Flow (IWC-7Q10) = 0.00052 (<1%)  
Instream Waste Concentration at Low Median Monthly Flow (IWC-LMM) = 0.00018 (<1%)  
Mixing Zone: 200 feet

Soundview Vermont Holdings, LLC owns and operates the Soundview Paper Company, a paper mill (Secondary Fiber De-ink category) which treats the effluent water in the following manner: primary clarification followed by a two-stage high activated sludge treatment process. Sludge from the two-stage aeration/clarifier system and from primary clarifier is wasted to a belt filter press for dewatering. Sludge is currently hauled out of state or to an approved VT landfill.

---

<sup>1</sup> 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.

<sup>2</sup> "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.

The receiving water is the Connecticut River. This river forms the boundary between Vermont and New Hampshire in the vicinity of this facility. The majority of the river is located in New Hampshire, but the discharge point is located in Vermont. For the purposes of this document reference will be made to water quality standards and classifications for both states as deemed appropriate. The Connecticut River a Class B (2) water as defined by Vermont and a Class B water as defined by New Hampshire. At the point of discharge, the river has a contributing drainage area of 5724.0 square miles. This facility does not discharge treated human waste and therefore does not have a waste management zone (WMZ). A 200' mixing zone for turbidity is included in the current permit. The receiving water is required to meet water quality standards at the end of the mixing zone for turbidity, and at the end of the pipe for other pollutants.

Vermont Water Quality Standards (VWQS) require that the aquatic biota based toxic pollutants criteria that prevent acute or chronic toxicity shall be applied at 7Q10 flows in rivers, streams, brooks, creeks, and riverine impoundments. Non-toxic pollutants and other water quality standards are applied at all flows, but a mixing zone may be authorized to allow for dilution within the zone before meeting water quality standards.

This facility has an existing 200' mixing zone. Putney Paper Company submitted a mixing zone analysis completed by Aquaterra in November 2005. The results indicated that a dilution factor of 67 was appropriate to apply to turbidity in the mixing zone. The Department concurred with the assumptions in the report in the issuance of the Department's prior permit.

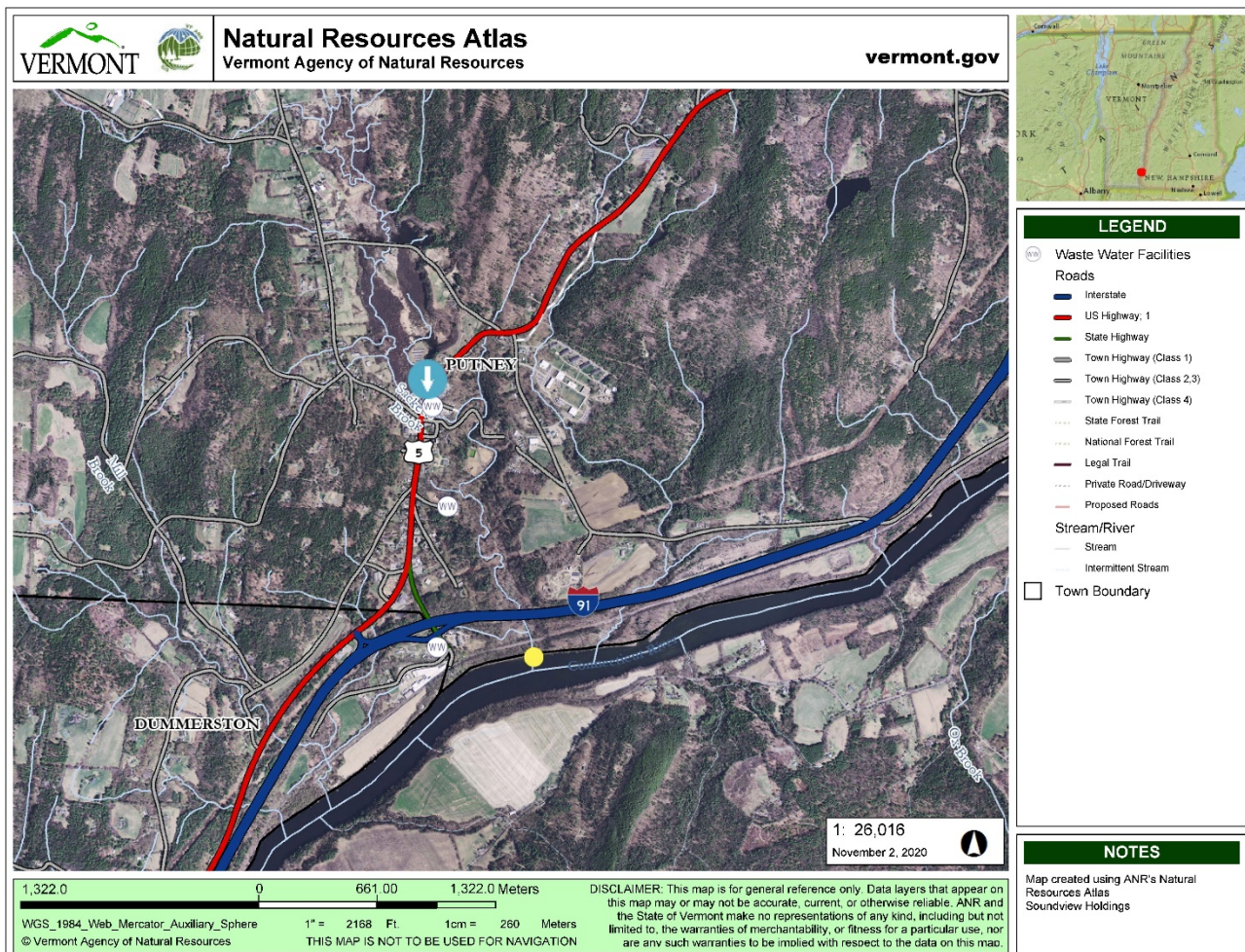


Figure 1. Connecticut River near the Soundview Paper Company. The facility location is represented by a white dot containing "WW" with a white arrow in a blue circle, the outfall location is represented by a yellow dot, two other wastewater plants (Town of Putney and the Green Mountain Spinnery) are represented by white dots containing "WW". Monitoring stations from NHDES are not shown on this map due to their distance from the facility. They are shown below in Figure 2. 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:

- Summary of Effluent Data for the Soundview Paper Company
- Ambient Chemistry Data for the Connecticut River above, below and near the effluent point for the Soundview Paper Company
- Assessment of Reasonable Potential (RP) of the Soundview Paper Company discharge to exceed Vermont Water Quality Standards (VWQS)

### III. Effluent Data for the Soundview Paper Company

#### A. Reported Effluent Data Summary:

Effluent data reported by the Soundview Paper Company is shown below in Table 1.

Table 1. Effluent Data for the Soundview Paper Company.

Parameter	Current Permit Limit	Minimum Value	Average Value	Maximum Value	n	# of Exceedances
S/N 001						
Annual Flow (MGD) (Monthly Average)	0.275	0.09	0.14	0.19	58	0
Biochemical Oxygen Demand, 5 Day, Monthly Average (lbs)	548	55.73	364.52	1070.68	58	5
Biochemical Oxygen Demand, 5 Day, Daily Max (lbs)	818	130.25	534.68	1419.50	57	6
Total Suspended Solids (lbs) Monthly Average	200	13.14	79.73	171.10	58	0
Total Suspended Solids (lbs) Daily Max	300	22.25	144.44	312.80	58	1
Total Phosphorus (mg/l)	monitor only	0.40	2.97	15.00	58	N/A
Total Nitrogen (mg/L)	monitor only	3.90	16.40	35.10	57	N/A
Turbidity (NTU)	550	92.00	230.19	534.00	58	0
pH	6.5-8.5	6.50	7.28	8.30	116	0

There were several parameters for which permit limit exceedances were reported. These include one exceedance for the Daily Maximum Total Suspended Solids, five exceedances of Monthly Average for BOD5 and six exceedances of the Daily Maximum for BOD5.

These violations were followed up on by DEC Wastewater Staff. They were caused by a change in process chemicals, some mechanical equipment failures, and some weather related high flow incidents. Corrective actions were taken and these violations were disclosed to DEC per their permit requirements.



**B. Whole Effluent Toxicity Data Summary:**

Results of the Whole Effluent Toxicity (WET) tests performed by this facility for the current and previous permit is shown below in Table 1a.

*Table 1a. Whole Effluent Toxicity Data for the Soundview Paper Company Wastewater Treatment Facility.*

	Test Start Date	Pimephales promelas				Ceriodaphnia dubia			
		Acute		Chronic		Acute		Chronic	
		NOEC %	LC50 %	NOEC %	LOEC %	NOEC %	LC50 %	NOEC %	LOEC %
Current Permit	8/15/2017	100	>100	6.25	12.5	50	73.5	6.25	12.5
	1/18/2016	50	61.6	<6.25	6.25	50	40.4	12.5	25
	3/16/2015	100	>100	25	50	100	>100	<6.25	6.25
	8/14/2013	50	79.4			100	>100		
Previous Permit	8/13/2012	100	>100			100	>100		
	1/11/2011	100	>100			50	>100		
	8/3/2010	25	>100			100	>100		
	1/21/2009	25	100			50	>100		
	9/30/2008	50	>100	25	50	100	>100	<6.25	6.25

Both Acute and Chronic toxicity can be observed in the test results for the current permit. However, the dilution provided by the receiving water reduces the in-stream concentrations below the measured toxicity thresholds. The two NOEC% values that are <6.25% indicate that the current tests do not have sufficient precision to demonstrate whether the receiving waters contained toxics in toxic amounts. Due to the significant dilution provided by the receiving water, this facility does not appear to pose a significant threat to aquatic biota, but toxicity should continue to be monitored. The requirement for 4 two-species acute and chronic WET tests should be included in the new permit. If technically feasible, WET tests should attempt to quantify toxicity below 6.25% by including an appropriate dilution.

**C. Ambient Chemistry Data for the Connecticut River above, below and near the Soundview Paper Company****1. Ambient Chemistry Data:**

The Connecticut River is located primarily in the state of New Hampshire and is unwadeable in most locations. As a result, the VT DEC does not routinely collect water quality data in the vicinity of the outfall of this vicinity. Data is collected along Sackett's Brook, but those waters are upstream of the effluent point and not influenced by it.

Data used to characterize the existing water quality in the Connecticut River upstream, downstream and near the effluent point were obtained from the New Hampshire Department of Environmental Services (NH DES). Data for three sampling stations have been included in tables 2a, 2b and 2c/2d below.

The upstream NH DES monitoring station is 06-V-03. It is in Walpole, NH and is approximately 10.5 river miles upstream of the effluent point. The downstream NH DES monitoring station is 06-V-02. It is in Chesterfield, NH and is approximately 3.7 river miles downstream of the effluent point. The NH DES monitoring station located near the effluent point is 08G-CNT. Data has been collected at this point both by NH DES and also by volunteers, and is presented in two separate tables. Data for 06-V-02 and 06-V-03 consists of multiple data points collected in order to form a profile of the parameter. This data has been presented as the average, minimum and maximum values for each site visit, i.e. the six (6) measurements for Dissolved Oxygen collected on 6/6/2015 at 06-V-02 between 14:59 and 15:02 have been reported as Average = 9.74 mg/l, Minimum = 9.69 mg/l and Maximum = 9.81 mg/l.

Data contained in Table 2a, 2b and 2c was obtained from NH DES and has been subjected to data review and verification procedures. The data contained in Table 2d has been submitted to NH DES for review and will be reviewed in the future according to the procedures in the NH DES Volunteer River Assessment Program (Quality Assurance Project Plan (QAPP) (<https://www.des.nh.gov/organization/divisions/water/wmb/vrap/documents/2017-vrap-qapp.pdf>). While this data has not been fully vetted, it is being used in this document to illustrate existing conditions and on inspection does not appear to be outside of the expected data range. This data was collected inside the established mixing zone and is not required to fully meet VWQS.

This section of the Connecticut River is listed on the 2018 NH DES 303(d) list for pH. This is considered to be a low priority for a TMDL and the effluent from this facility does not have potential to significantly impact the pH of the receiving water.

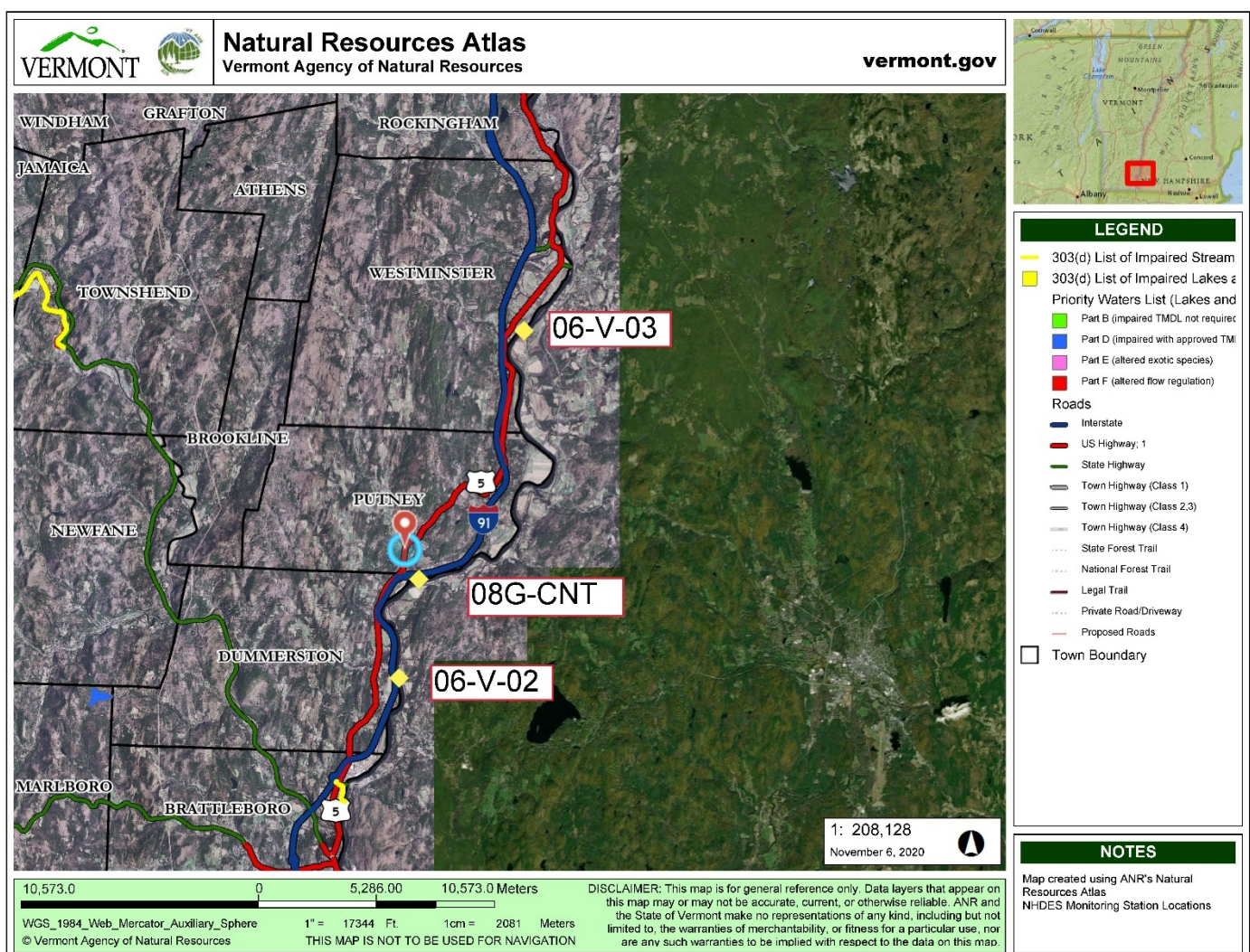


Figure 2. NH DES sampling locations near the Soundview Paper Company. The facility location is represented by a red pin with a blue circle, and the approximate locations of the sampling stations are shown by yellow diamonds. Figure produced with the Vermont Agency of Natural Resources Natural Resource Atlas (<https://anrmaps.vermont.gov/websites/anra5/>).



Table 2a. Surface-water quality data above the Soundview Paper Company Wastewater Treatment Facility from NHDES.

DATE	UPSTREAM OR DOWNSTREAM	NH DES MONITORING STATION ID	DISSOLVED OXYGEN (MG/L)			DISSOLVED OXYGEN SATURATION (%)			PH			SPECIFIC CONDUCTANCE (US/CM)			TEMPERATURE WATER (DEGREE C)			TURBIDITY (NTU)		
			AVERAGE	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	MIN	MAX
6/6/2015	Downstream	06-V-02	9.74	9.69	9.81	99.3	98.7	100.1	7.40	7.38	7.41	92	92	92	16.28	16.27	16.29	0.38	0.00	0.90
6/12/2015	Downstream	06-V-02	8.86	8.82	8.87	93.8	93.4	93.9	7.41	7.36	7.43	99	99	99	18.10	18.09	18.11	1.13	0.00	3.30
6/17/2015	Downstream	06-V-02	9.35	9.33	9.36	98.4	98.1	98.5	7.47	7.46	7.48	92	92	92	17.82	17.80	17.86	0.18	0.00	0.90
6/27/2015	Downstream	06-V-02	9.18	9.16	9.20	100.0	99.8	100.2	7.42	7.39	7.44	85	85	85	19.50	19.49	19.51	2.67	2.30	3.30
7/9/2015	Downstream	06-V-02	8.87	8.81	8.91	101.3	100.3	102.9	7.48	7.45	7.51	113	113	113	21.93	21.71	22.48	0.47	0.30	0.60
7/17/2015	Downstream	06-V-02	8.40	8.35	8.43	99.2	98.6	99.6	7.56	7.54	7.57	143	142	143	23.71	23.68	23.73	0.18	0.10	0.40
7/22/2015	Downstream	06-V-02	8.20	8.16	8.22	95.8	95.3	96.0	7.47	7.45	7.48	128	128	128	23.09	23.08	23.10	1.13	0.90	1.60
7/31/2015	Downstream	06-V-02	8.52	8.37	8.68	103.5	101.0	106.1	7.62	7.60	7.65	127	127	127	25.21	24.86	25.83	1.13	1.10	1.20
8/4/2015	Downstream	06-V-02	8.17	8.01	8.31	98.2	95.8	101.2	7.53	7.51	7.56	137	136	138	24.58	24.36	25.33	1.19	1.10	1.30
8/13/2015	Downstream	06-V-02	8.01	7.98	8.03	95.6	95.3	96.0	7.58	7.57	7.59	144	144	144	24.29	24.28	24.30	1.43	1.40	1.50
8/23/2015	Downstream	06-V-02	7.80	7.63	7.94	93.6	91.3	95.6	7.70	7.68	7.72	157	156	157	24.48	24.34	24.68	0.83	0.80	0.90
8/31/2015	Downstream	06-V-02	8.32	8.03	8.62	100.4	96.2	106.0	7.65	7.56	7.74	145	144	145	24.79	24.43	25.85	0.73	0.60	0.80
9/13/2015	Downstream	06-V-02	7.47	7.37	7.54	88.3	87.2	89.2	7.58	7.56	7.60	154	154	154	23.76	23.74	23.78	0.50	0.50	0.50
9/24/2015	Downstream	06-V-02	8.64	8.45	8.77	97.1	94.7	99.2	7.72	7.68	7.74	153	153	153	21.10	20.92	21.39	0.38	0.10	1.00
10/2/2015	Downstream	06-V-02	10.01	9.98	10.04	102.0	101.7	102.4	7.54	7.50	7.55	120	120	120	16.26	16.26	16.27	23.30	19.40	27.20

Table 2b. Surface-water quality data downstream of the Soundview Paper Company Wastewater Treatment Facility collected by NHDES.

DATE	UPSTREAM OR DOWNSTREAM	NH DES MONITORING STATION ID	DISSOLVED OXYGEN (MG/L)			DISSOLVED OXYGEN SATURATION (%)			PH			SPECIFIC CONDUCTANCE (US/CM)			TEMPERATURE WATER (DEGREE C)			TURBIDITY (NTU)		
			AVERAGE	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	MIN	MAX	AVERAGE	MIN	MAX
6/6/2015	Upstream	06-V-03	10.07	10.05	10.08	103.2	103.1	103.3	7.50	7.50	7.50	94	94	94	16.55	16.52	16.57	0.20	0.00	0.40
6/12/2015	Upstream	06-V-03	9.01	9.01	9.02	95.9	95.9	96.0	7.51	7.50	7.51	99	99	99	18.35	18.35	18.36	0.23	0.00	0.40
6/17/2015	Upstream	06-V-03	9.55	9.53	9.56	101.3	101.2	101.5	7.53	7.52	7.55	92	91	92	18.22	18.20	18.23	0.08	0.00	0.10
6/27/2015	Upstream	06-V-03	9.24	9.22	9.24	101.7	101.5	101.8	7.52	7.52	7.52	87	87	87	20.05	20.05	20.06	2.18	2.10	2.30
7/9/2015	Upstream	06-V-03	9.61	9.58	9.63	110.9	110.5	111.1	7.74	7.73	7.74	135	135	135	22.43	22.42	22.43	2.08	1.90	2.20
7/17/2015	Upstream	06-V-03	9.08	9.08	9.09	107.5	107.5	107.5	7.82	7.82	7.83	148	148	148	23.77	23.77	23.77	0.90	0.80	1.00
7/22/2015	Upstream	06-V-03	8.31	8.29	8.33	96.6	96.4	96.9	7.51	7.48	7.53	130	130	130	22.88	22.87	22.89	3.60	3.40	3.80
7/31/2015	Upstream	06-V-03	9.34	9.33	9.35	113.3	113.2	113.4	7.73	7.70	7.77	120	120	120	25.08	25.06	25.09	1.63	1.50	1.70
8/4/2015	Upstream	06-V-03	9.32	9.30	9.32	113.7	113.5	113.7	7.82	7.81	7.82	157	157	157	25.43	25.42	25.44	0.88	0.80	0.90
8/13/2015	Upstream	06-V-03	8.06	8.04	8.07	96.1	95.9	96.2	7.61	7.60	7.62	147	147	147	24.20	24.19	24.20	1.85	1.80	1.90
8/23/2015	Upstream	06-V-03	9.10	9.09	9.11	109.8	109.7	109.9	7.86	7.84	7.87	141	138	143	24.82	24.81	24.82	0.80	0.70	0.90
9/1/2015	Upstream	06-V-03	7.91	7.90	7.93	93.3	93.1	93.4	7.51	7.50	7.52	142	142	142	23.57	23.57	23.57	0.00	0.00	0.00
9/14/2015	Upstream	06-V-03	7.65	7.64	7.66	87.8	87.7	88.0	7.59	7.58	7.60	162	162	162	22.19	22.19	22.20	10.20	9.60	11.30
9/24/2015	Upstream	06-V-03	9.78	9.69	9.81	109.8	108.6	110.3	7.95	7.92	7.97	158	158	158	21.02	20.90	21.13	0.25	0.20	0.30
10/2/2015	Upstream	06-V-03	10.26	10.25	10.27	104.1	104.0	104.2	7.53	7.50	7.55	113	113	113	16.08	16.07	16.09	24.51	23.70	25.20

Table 2c. Surface-water quality data near effluent point for the Soundview Paper Company Wastewater Treatment Facility collected by NHDES.

DATE	LOCATION	NH DES MONITORING STATION ID	CHLORIDE (MG/L)	GRAN ACID NEUTRALIZING CAPACITY (MG/L)	PH	SPECIFIC CONDUCTANCE (US/CM)	PHOSPHORUS AS P (MG/L)	E. COLI MPN/100 ML
7/26/2018	Near Discharge	08G-CNT	25.40	60.40	7.40	189.90	0.15	488.40

Table 2d. Surface-water quality near effluent point for the Soundview Paper Company Wastewater Treatment Facility collected by the Connecticut River Conservancy.

DATE	SPECIFIC SAMPLE SITE DESCRIPTION	DISSOLVED OXYGEN (MG/L)	DISSOLVED OXYGEN SATURATION (%)	PH	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEGREE C)	TURBIDITY (NTU)
7/2/2020	10' d/s of the outfall but only at the surface	-	-	7.47	-	-	1.04
	~ 10' u/s of it at ~ 6" deep	-	-	8.16	-	-	1.74
	at the outfall at ~ 6" deep	-	-	7.45	-	-	1.08
7/21/2020	4 feet below water level at outfall	-	-	7.07	-	-	2.42
	bucket at surface at outfall site	4.07	50.4	7.25	204.8	26.2	1.79
	10' d/s of the outfall but only at the surface	-	-	7.54	-	-	0.99
8/5/2020	4 feet below water level at outfall	4.64	54.9	7.16	240.3	23.8	2.88
	bucket at surface at outfall site	5.13	61.9	7.41	220.8	24.8	2.8
	10' d/s of the outfall at surface	-	-	7.26	-	-	2.04
	20' d/s of the outfall at surface	-	-	7.41	-	-	1.15
8/20/2020	4 feet below water level at outfall	5.61	66.2	7.74	259.9	24.2	1.98
	bucket at surface at outfall site	5.63	67.8	7.76	160.2	26.2	0.44
	10' d/s of the outfall at surface	-	-	7.76	-	-	0.71
	20' d/s of the outfall at surface	-	-	8.03	-	-	0.69
9/11/2020	4 feet below water level at outfall	5.54	62.3	7.52	568	21.1	9.39
	bucket at surface at outfall site	6.68	76.1	7.87	224.8	21.8	1.45
	10' d/s of the outfall at surface	-	-	7.96	-	-	1.19

#### IV. Assessment of Reasonable Potential of the Soundview Paper Company WWTF discharge to exceed Vermont Water Quality Standards

##### A. 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 3, 4 and 5 present this analysis for the Soundview Paper Company.

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

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  $C_{etsd}$ .

$$\text{Equation 2. } C_{etsd} = \text{TSD}_{\text{factor}} \times C_e$$

Where:

$C_{etsd}$  = Effluent concentration adjusted to 95th percentile value (mg/L or ug/L)

$\text{TSD}_{\text{factor}}$  = Factor based upon EPA TSD Table 3-2, pg 54

$C_e$  = critical (maximum observed) effluent pollutant concentration (mg/L or ug/L)

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:

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

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.
- Effluent pollutant concentrations ( $C_e$ ) were set to the maximum observed effluent concentrations \* TSD 95<sup>th</sup> percentile multiplier over the last 5 years of data collected except for E. coli which was set at the instantaneous limit. The symbol  $C_{etsd}$  is used to represent this value.

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

## **B. Chlorine**

This facility does not treat sanitary sewage and does not discharge chlorine.

## **C. Biochemical Oxygen Demand, 5 Day and Total Suspended Solids**

This facility is subject to the effluent limitations required by 40 CFR Part 430. The applicable subcategory is Secondary Fiber Deink (Subpart I). The annual production for this facility is listed on the application as 90 tons per day. Using the categorical standards and this production rate, the BOD and TSS limits would be as follows:

Pollutant or Parameter	Daily Max (kg/kkg/day = lb/ 1000 lb/day)	Monthly Average (kg/kkg/day = lb/ 1000 lb/day)	Daily Max (lbs/ton/day)	Monthly Average (lbs/ton/day)	Production (Tons per day)	Daily Max (lbs/day)	Monthly Average (lbs/day)
BOD5	18.1	9.4	36.2	18.8	90	3258	1692
TSS	24.05	12.95	48.1	25.9	90	4329	2331
pH	Between 5 and 9						

*Best Practicable Control Technology Limits for secondary deink paper mills from 40 CFR 430.*

The current permitted BOD limits are 548 lbs/day, monthly average, and 818 lbs/day, daily maximum. The current permitted TSS limits are 200 lbs/day, monthly average, and 300 lbs/day, daily maximum. These limits are lower than the limits required by 40 CFR Part 430.

This facility has had one violation of TSS in the last five years. There is not a numeric VWQS for TSS, and the existing permit limits are far lower than the Best Practicable Control Technology (BPT) effluent limits required by 40 CFR 430. There does not appear to be reasonable potential for this discharge to violate VWQS for TSS.

There have been complaints about brown, foamy floating masses downstream of the outfall, and videos indicate that bubbles from the outfall pipe create foam at the surface. The composition of the foam is unknown, as is the composition of the gas bubbles. It is possible that fatty acids within the effluent contribute to the foam, but this facility utilizes carefully dosed anti-foam agents in their processes. The treatment

technology is very sensitive to foaming, so it is not likely that the effluent contains significant quantities of foam. In order to gather more information about the occurrence and nature of foam downstream of this facility the permit should contain a requirement that the permittee institute a program to gather, track and investigate aesthetic complaints related to their discharge. Operational changes such as more frequent pipe cleaning, air release valves upstream of the effluent point or other engineering controls should be considered.

This section of the Connecticut River is not impaired for oxygen as shown in Tables 2a and 2b. Additionally, this section is not on either the Vermont or the New Hampshire 303(d) list for oxygen. As shown in Table 2d, oxygen levels are depressed in the immediate vicinity of the outfall. Some of these measurements are below the VWQS for Cold Water Fish Habitat and the NHWQS for a Class B river.

VWQS require that the receiving water contain 6 mg/l of Dissolved Oxygen with a saturation of 70% at all times. NHWQS require an instantaneous minimum of 5 mg/l and daily average of 75% saturation. It is noted that the water temperatures are high for a Cold Water Fish Habitat, and that compliance with Warm Water Fish Habitat limits may be more realistic.

The VWQS requirements can be waived in a mixing zone.

Based upon the dissolved oxygen values in the receiving water, the lack of 303(d) listing for the receiving water, the existing permit limits which are considerably under the Federal limits, and the general compliance with those limits for BOD5, this facility does not have a reasonable potential to violate VWQS for this parameter once an initial dilution has occurred.

The existing mixing zone language should be updated to include BOD/dissolved oxygen. Due to the limited extent of the mixing zone and the reaeration provided by the river this mixing zone will not pose a barrier to aquatic life.

#### **D. pH**

This facility consistently meets their effluent pH limits. The receiving water does not seem to be impaired for pH near the discharge point, although it is on the 2018 NH DES 303(d) list. This reach is listed for Aquatic Life Integrity, with the last exceedance observed in 2004 and the priority for this reach to have a TMDL developed is Low. As currently operated this facility does not pose a reasonable potential for exceeding the water quality standards for pH.

**E. Turbidity**

The results of mass balance calculation for Turbidity calculated using Equation 1 are presented in Table 3 below.

*Table 3. Reasonable Potential Calculation for Turbidity near the Soundview Paper Company*

	<b>Turbidity TSD RPD Calculation</b>	<b>Notes</b>
<b>Qs (cfs)</b>	817.96	Estimated 7Q10 flow
<b>Qe (cfs)</b>	0.425	permitted effluent discharge
<b>Qr = Qs + Qe (cfs)</b>	818.39	Qs+Qe
<b>7Q10 IWC</b>	0.0005	Qe/(Qs+Qe)
<b>Cs (NTU)</b>	1.78	average of upstream dry weather pollutant concentrations. Data from 10/2/2015 has been excluded due to precipitation upstream of the station within the 48 hours prior to the sample collection.
<b>C<sub>etsd</sub> (NTU)</b>	694	effluent pollutant concentration adjusted by TSD factor
<b>Cr = (CsQs+CetsdQe)/Qr (NTU)</b>	2.13	resultant pollutant concentration in receiving water assuming full mix.
<b>VWQS Criteria (NTU)</b>	10.00	Turbidity Criteria for Cold Water fish habitat. (NHWQS for Class B River is an increase of 10 NTU over ambient turbidity. VWQS is more protective).
<b>Exceedance Calculated?</b>	NO	No Reasonable Potential.

This facility does not have reasonable potential to violate VWQS for turbidity when fully mixed. There is an existing mixing zone and limit which was instituted in order to prevent the effluent from exceeding 10 NTU. This facility currently has a turbidity limit and mixing zone which should be retained.

The permit includes a turbidity limit and daily monitoring requirement. The Vermont Water Quality Standards cite a limit of 10 NTU. However, during a previous permit renewal, the previous facility owner indicated that effluent monitoring results are significantly greater than the 10 NTU and requested a mixing zone as part of the permit application. The permittee conducted a dilution study in order to determine: 1) whether there was sufficient dilution in the Vermont portion of the receiving water to establish a mixing zone; and 2) if the outfall would need to be modified to insure that the mixing zone would remain in Vermont waters.

Putney Paper Company submitted a mixing zone analysis completed by Aquaterra in November 2005. The results indicated that the permittee could discharge up to 630 NTU and still meet the WQS limit of 10 NTU at the end of a 200 foot mixing zone without modifying the outfall. The Department concurred with the assumptions in the report in the issuance of the Department's prior permit which held a discharge limit of 630 NTU maximum. A more restrictive limit of 550 NTU was included in the previous permit.

Multiple complaints have been received regarding the turbidity of the effluent from this facility. A review of the discharge data and application of the conservative dilution factor indicate that this facility has excellent compliance with their turbidity limit, and that the turbidity in the receiving waters meets the water quality standard of 10 NTU (VWQS) at the end of the mixing zone and meets the NHWQS of not contributing more than 10 NTU above ambient conditions outside the mixing zone.

Water quality samples, including turbidity, have been collected at near discharge point by members of the Connecticut River Conservancy. This data is presented above in Table 2d; however, it has not been verified to meet the requirements of their QAPP by NH DES. For discussion purposes that data is being treated as valid in this document.

The maximum value of the turbidity samples collected at the outfall is 9.39 NTU collected on September 11, 2020. This is less than the permitted limit of 550 NTU and meets water quality standard of 10 NTU without the additional dilution provided by the mixing zone, or the further dilution into the flow of the river beyond the mixing zone.

Ambient turbidity in this section of the Connecticut River is lower than that of the effluent, and the contrast in turbidity between the effluent plume and the unmixed flows is visible. However, the calculated turbidity values from the effluent data are well within both existing permit limits and water quality standards, and the turbidity measured within the mixing zone also meets the water quality standards.

As currently operated this facility does not pose a reasonable potential for exceeding the water quality standards for turbidity outside of the established mixing zone. This mixing zone and existing permit limit should be retained.

#### **F. Total Metals**

This facility has an IWC of 0.0005 at 7Q10. Based upon the Reasonable Potential Determination Decisions Trees prepared by the VT DEC Wastewater Program in conjunction with the MAPP program it has been determined that this facility does not have a reasonable potential to cause or contribute to exceedances of water quality standards for metals in the receiving water.

#### **G. Nutrients**

The potential Total Phosphorus and Total Nitrogen effluent loads for Soundview Vermont Holdings using Equation 1 are presented in Table 5 below.



Table 5. Assessment of Potential Total Phosphorus and Total Nitrogen Daily Effluent Load from the Soundview Paper Company

	Total Phosphorus	Total Nitrogen	Notes
Qe (MGD)	0.275		permitted effluent discharge
Cetsd (mg/L)	22.5	42.1	effluent pollutant concentration adjusted by TSD method.
Daily Load (lbs/day) = 8.34 * Flow (MGD)* Nutrient Concentration (mg/l)	51.6	96.6	Potential Daily Load from Soundview Paper Company

### 1. Total

#### Nitrogen (TN):

TN is the sum of nitrate, nitrite, ammonia, soluble organic nitrogen, and particulate organic nitrogen.

TN is a calculated value based on the sum of NO<sub>x</sub> 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) + NO<sub>x</sub> (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).

This facility discharges to the Connecticut River which ultimately discharges to the Long Island Sound. Target TN goals have been established for municipal wastewater plants along the Connecticut River in Vermont, but this facility has not been assigned a goal. As shown in Table 5, the probable maximum TN load in the effluent at the full design flow is 96.6 lbs/day. The current monitor only conditions for TN should be retained.

## **2. Total Phosphorus (TP):**

The Connecticut River is not subject to Total Phosphorus limitations. As shown in Table 5, the probable maximum TP load in the effluent at the full design flow is 51.6 lbs/day. A monitor only condition is recommended for continued inclusion in the draft permit.

## ***V. Summary of Reasonable Potential Determinations***

The analysis of available data does not clearly indicate any Reasonable Potential to cause an exceedance of VWQS as this facility is currently operated. However, very limited data was available for use in the analysis. The VT DEC MAP program should establish upstream and downstream monitoring locations for this facility and collect water quality parameters at a minimum frequency of once every five years. This monitoring could also be conducted by volunteer groups under an approved QAPP. This monitoring should include Dissolved Oxygen, Dissolved Oxygen Saturation, Temperature, Turbidity, BOD5, TP, TN, NO<sub>x</sub>, TKN, TAN, priority metals, hardness, pH, turbidity and an assessment of aesthetic conditions. Additional monitoring is recommended so that these analyses can be repeated with increased robustness during the next permit issuance cycle.

### ***Recommended Biological and Water Quality Monitoring:***

No additional instream monitoring by this facility is recommended.

### ***A. 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:

- This facility has been subject to several complaints regarding the presence of foam downstream of the discharge point. It is recommended that the facility develop a program to track these complaints, correlate them with discharge conditions and develop measures to minimize the entrainment of air within the effluent. Engineering controls should be considered.
- The effluent has a reasonable potential to depress oxygen levels below VWQS in the vicinity of the effluent point. This reasonable potential disappears when the dilution from the existing mixing zone is applied. The mixing zone language should be expanded to include BOD and dissolved oxygen. The existing limit is protective of VWQS once mixing has occurred. The requirement for 4 two-species acute and chronic WET tests should be included in the new permit. If technically feasible, WET tests should attempt to quantify toxicity below 6.25% by including an appropriate dilution.

### ***B. Conclusion:***

After review of all available information, it has been determined that there is not a reasonable potential for the discharge to cause or contribute to a water quality violation. Given the dilution (IWC at 7Q10 is = 0.0005 (<1%)), 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.