

Comprehensive WWTF Upgrades

Whitefield, NH

May, 2023

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NPDES Permit Drivers

“ Why are nutrients an issue in the environment?”

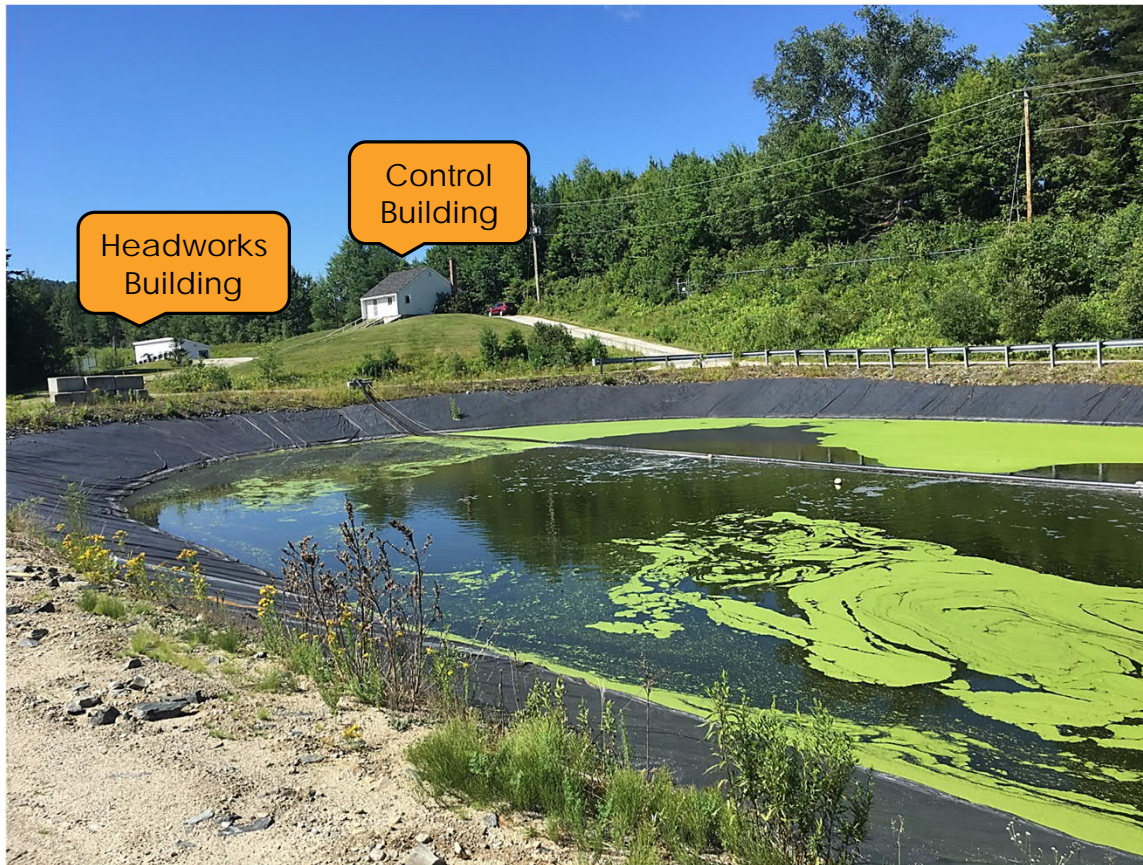
- Stimulates algae and plant growth, DO issues
- **Total Phosphorus** – limiting freshwater nutrient
- **Total Nitrogen** – limiting marine water nutrient

“ Why might my permit change?”

- Updated nutrient or toxicant criteria (NHDES, EPA)
- Changes in receiving water body (impairment, dilution)
- Reasonable potential calculations
- Total Maximum Daily Load (TMDL) development



Previous WWTF



- Aerated Lagoon Facility brought online in 1985
- Treats ~120,000 gals/day (annual avg.) of domestic sewer and discharges to the John's River
- Headworks Building
 - Grit Channels
 - Manual Bar Rack for Influent Screening
- Control Building
 - Lagoon Blowers
 - Lab

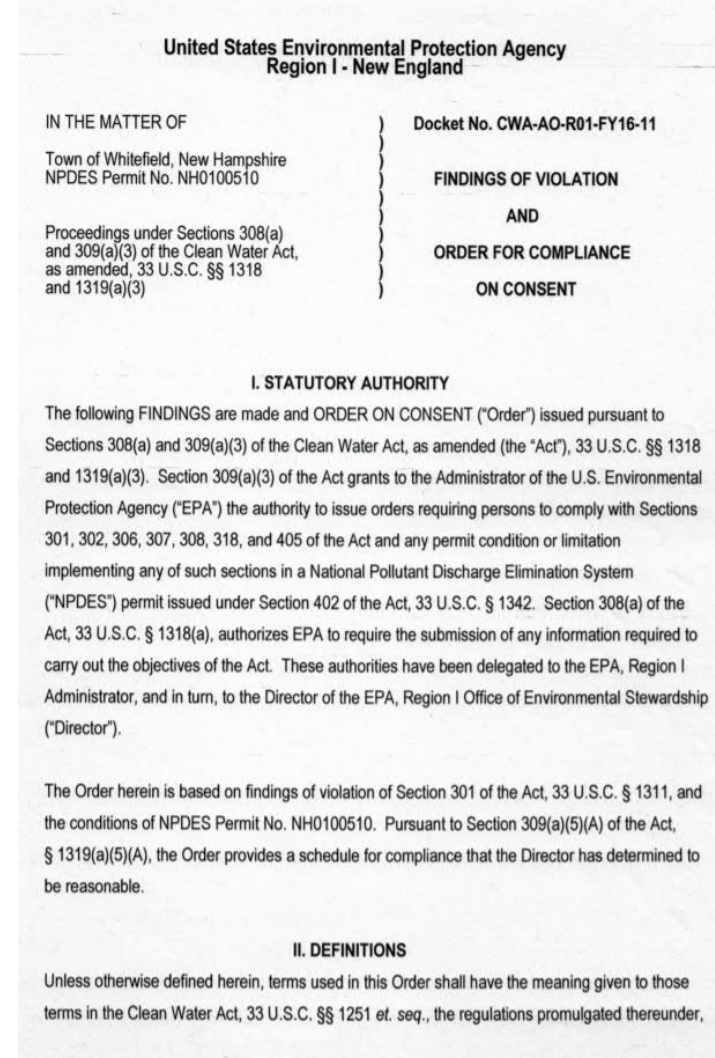
Project History

Administrative Order on Consent

- Address current effluent violations
- Total Phosphorus limit: 0.5 mg/L

Project Dates

- Complete design of improvements: 5/31/2019
- Initiate construction: 9/1/2019
- Substantial completion: 5/31/2020



Whitefield WWTF Timeline

1985



WWTF Brought Online

2016



EPA Issued Administrative Order on Consent (AOC) to come in compliance with NPDES permit

2017/2018



Facilities Planning Study for WWTF upgrade

Town awarded \$6.5M in funding from RD including a 45% grant and a \$399,200 septage grant from NBRC

2019



100% design completed, project bid

Town awarded \$1.6M for long-term financing through CWSRF

2019



Construction for the WWTF Upgrade began 11/27/2019

2021



Town to come in compliance with AOC by 7/31/2021

Construction substantial completion by 8/15/2021

Nutrient Removal Upgrade Considerations

- What are my site specific requirements?
 - Total Phosphorus (TP) – lbs vs. mg/L
 - Total Nitrogen (TN) – lbs vs. mg/L
 - Seasonal vs. Year-round
- Potential future NPDES permit limits
- Condition of existing infrastructure and process
- Performance of existing process
- Adaptability of existing process



Aerated Lagoon



Oxidation Ditch



Plug-Flow BNR
Reactor

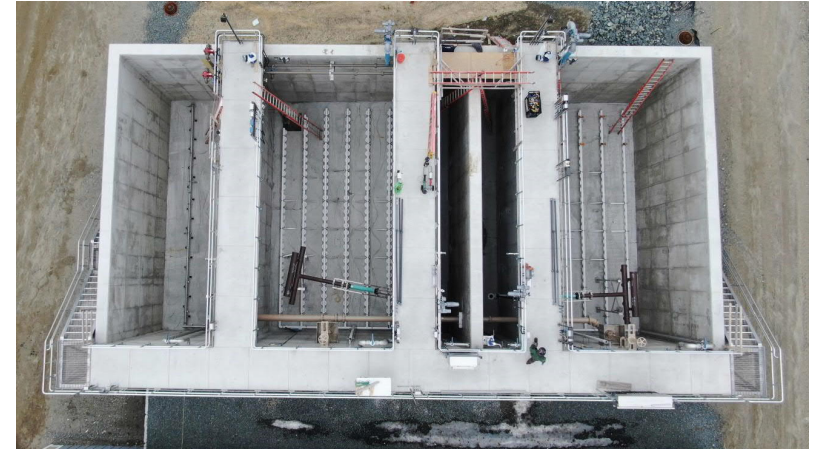
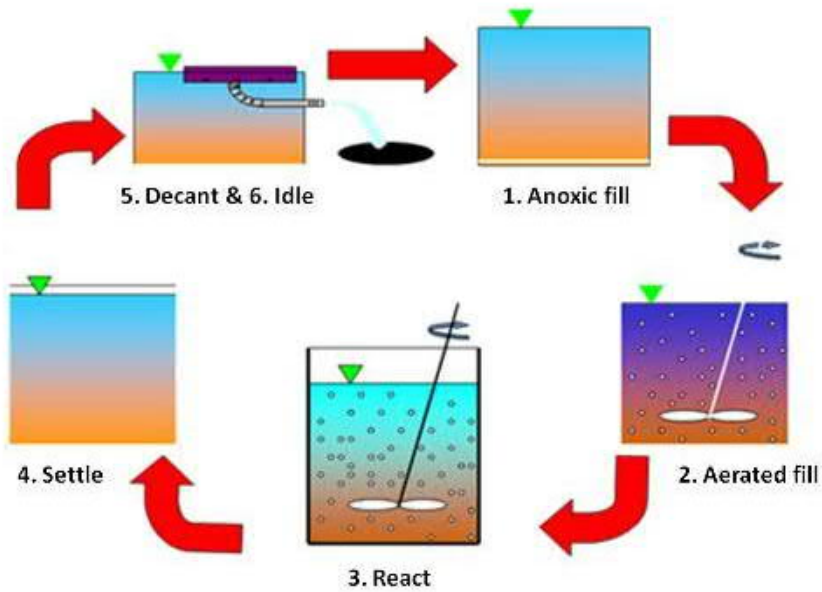


Sequencing Batch
Reactors (SBRs)

Biological Nutrient Removal Treatment Alternatives

Sequencing Batch Reactor

5 - 8 mg/L Total Nitrogen
1 - 2 mg/L Total Phosphorus



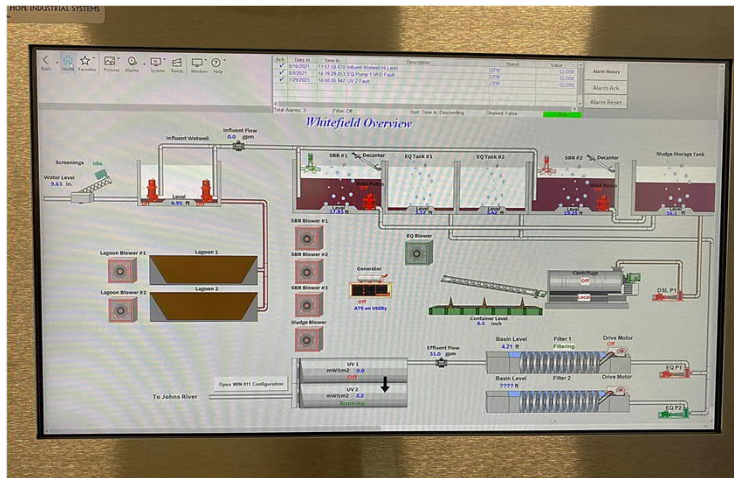
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- Process Building
- Headworks Building
- Process Tankage including **SBR Treatment**
 - TN Removal
 - TP Removal (Bio-P)
- Chemical Addition (FeCl)
- Tertiary Filtration (TP removal)
- Sludge Dewatering

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Hello New
Technology!



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Process Building



Secondary Treatment

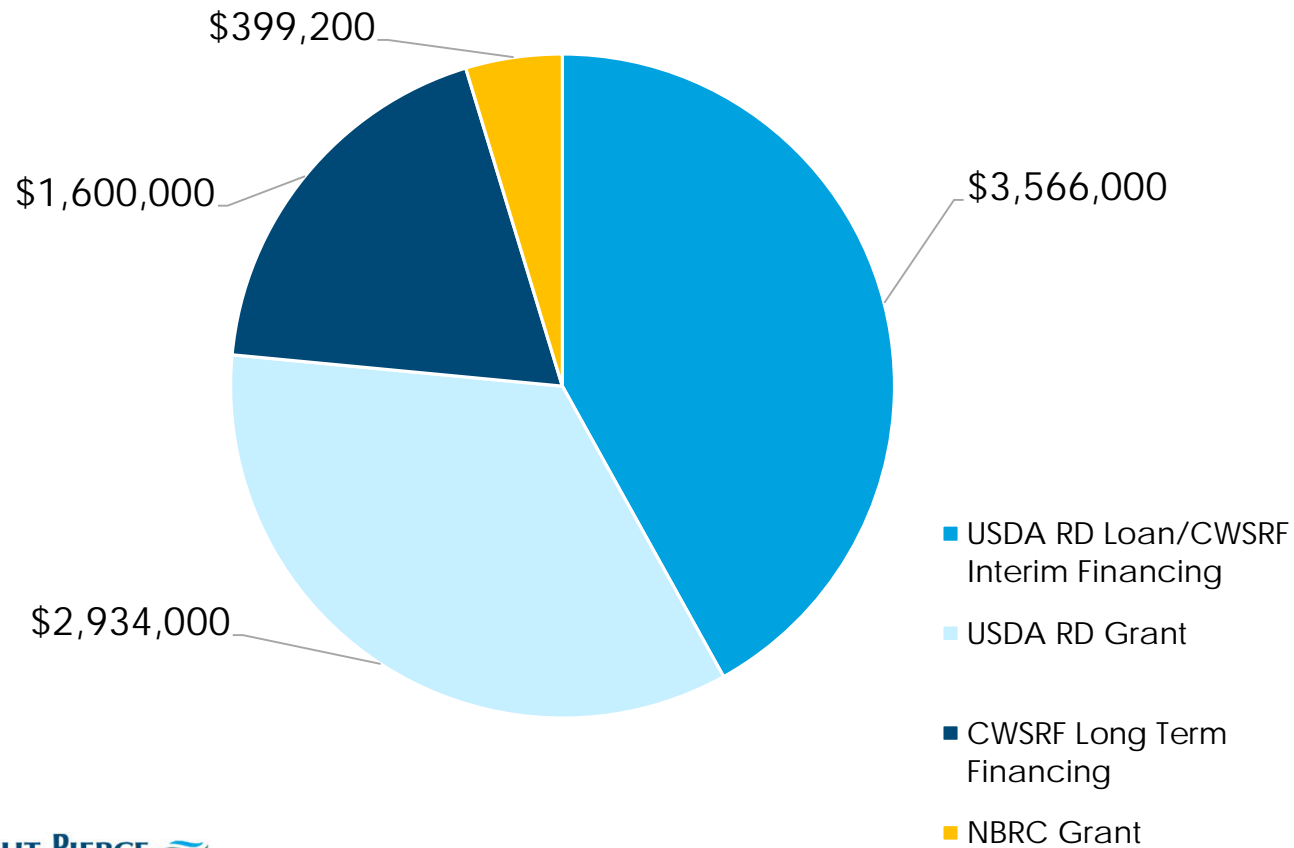
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“ So, what’s it cost to meet these new permit changes?”



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Total Project Cost: \$8.5M



Committed to the future of rural communities.



Northern Border Regional Commission

NPDES Small General Permit (NH & MA)

- Final issued in 9/28/2021
- WWTP's < 1 MGD design flow
- EPA's "umbrella" approach to address NPDES permit renewals
- ~29 WWTPs in NH are eligible
- **Nutrients**, ammonia, metals – site specific

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMITS FOR SMALL WASTEWATER TREATMENT FACILITIES (WWTFs)

Note: These permits are organized as a single permit and are referred to herein as the "General Permit" or the "WWTF GP". The effluent limitations and specific conditions for facilities in Massachusetts and New Hampshire are contained in Parts II and III, respectively. Parts IV through VIII include conditions which are common to both permits.

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The following documents are separate attachments to the WWTF General Permit:

Part VIII – Standard Conditions

- Attachment A – Freshwater Acute Toxicity Test Procedure and Protocol, February 2011
- Attachment B – Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013
- Attachment C – Marine Acute Toxicity Test Procedure and Protocol, July 2012
- Attachment D – Marine Chronic Toxicity Test Procedure and Protocol, November 2013
- Attachment E – List of Eligible Facilities

I. Applicability and Coverage of the WWTF GP

A. Eligible Discharges

Wastewater treatment facilities, including publicly owned treatment works and other treatment works that treat domestic sewage (collectively "wastewater treatment facilities", "facilities" or "WWTFs") are classified as either a "major" or a "minor" discharger. Major dischargers are facilities with design flows equal to or greater than 1 million gallons per day (MGD) and any other facilities designated by EPA, in its discretion, as a "major" facility (40 CFR §§ 122.2, 124.2). All other facilities are generally classified as "minor" dischargers. Coverage under the WWTF GP is available only to minor facilities in Massachusetts and to major and minor facilities in New Hampshire that meet the requirements of this Part. See Attachment E for a list of eligible facilities.

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NPDES Permit & Small General Permit

	NPDES Permit (April 2022)	Notes
BOD5 (mg/L)	30	
TSS (mg/L)	30	
Total Phosphorus (lb/day)	0.79	Apr 1 – Oct 31
Ammonia (mg/L)	21.5	Jun 1 – Oct 31
Total Copper (ug/L)	18.5	
Total Aluminum (ug/L)	87	
PFAS Monitoring	N/A	

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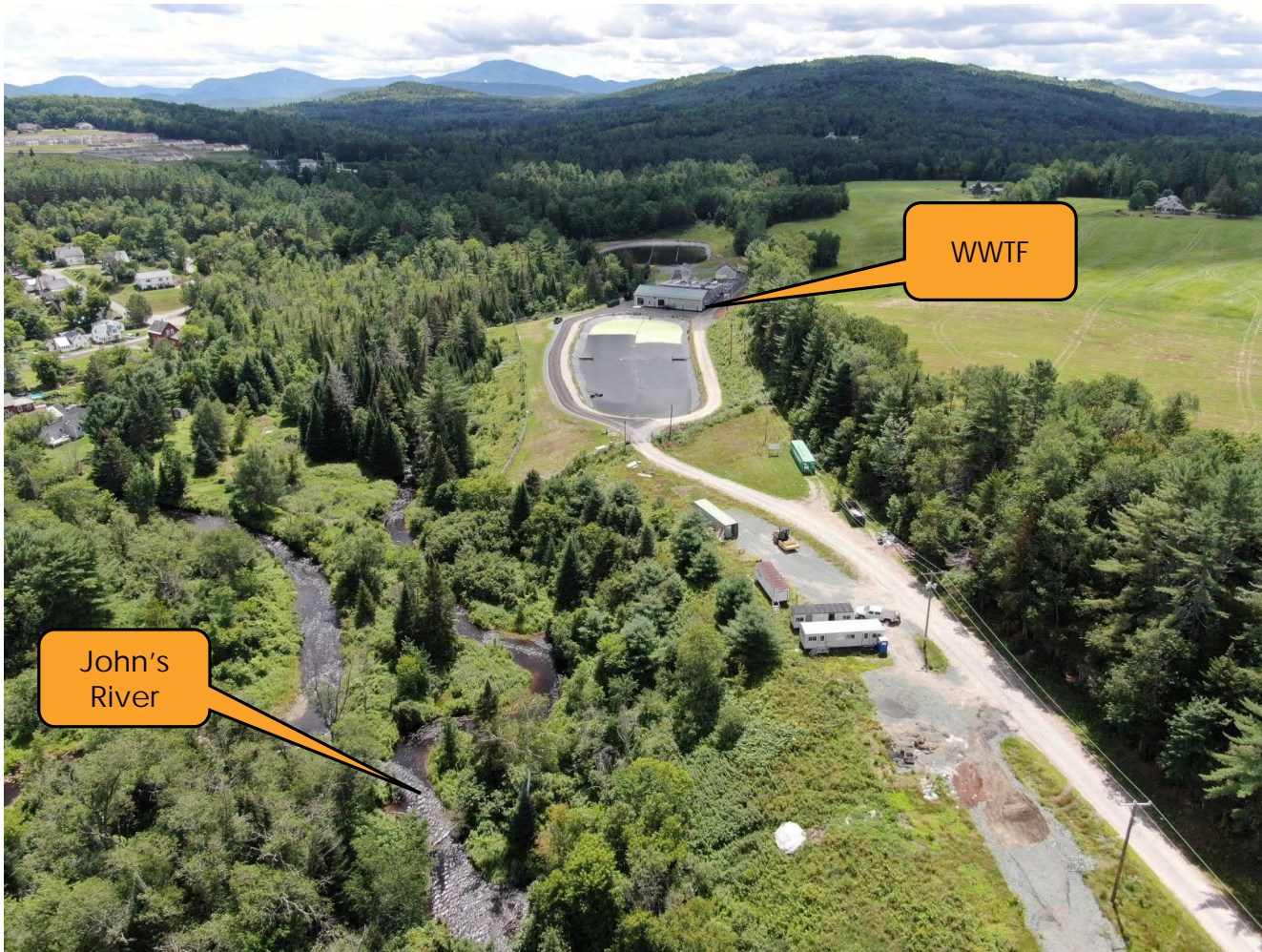
Previous & Upgraded Conditions

	March 2021	July 2021*
BOD5 (mg/L)	29	11
TSS (mg/L)	30	7
Total Phosphorus (mg/L)	7	< 3**
Ammonia (mg/L)	42	1
Total Copper (ug/L)	31	8
Total Aluminum (ug/L)	39	0

*New WWTF brought online May/June 2021

**Prior to chemical optimization for TP removal

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THANK YOU
